Nova Scotia Utility and Review Board

IN THE MATTER OF Section 35A of *The Public Utilities Act,* R.S.N.S. 1989, c.380, as amended

- and -

IN THE MATTER OF an Application by Nova Scotia Power Inc. for Approval of the **2025 Annual Capital Expenditure (ACE) Plan**

2025 ACE Plan

Date Filed: December 9, 2024

CONFIDENTIAL (Attachments Only)

Nova Scotia Power

2025 Annual Capital Expenditure Plan



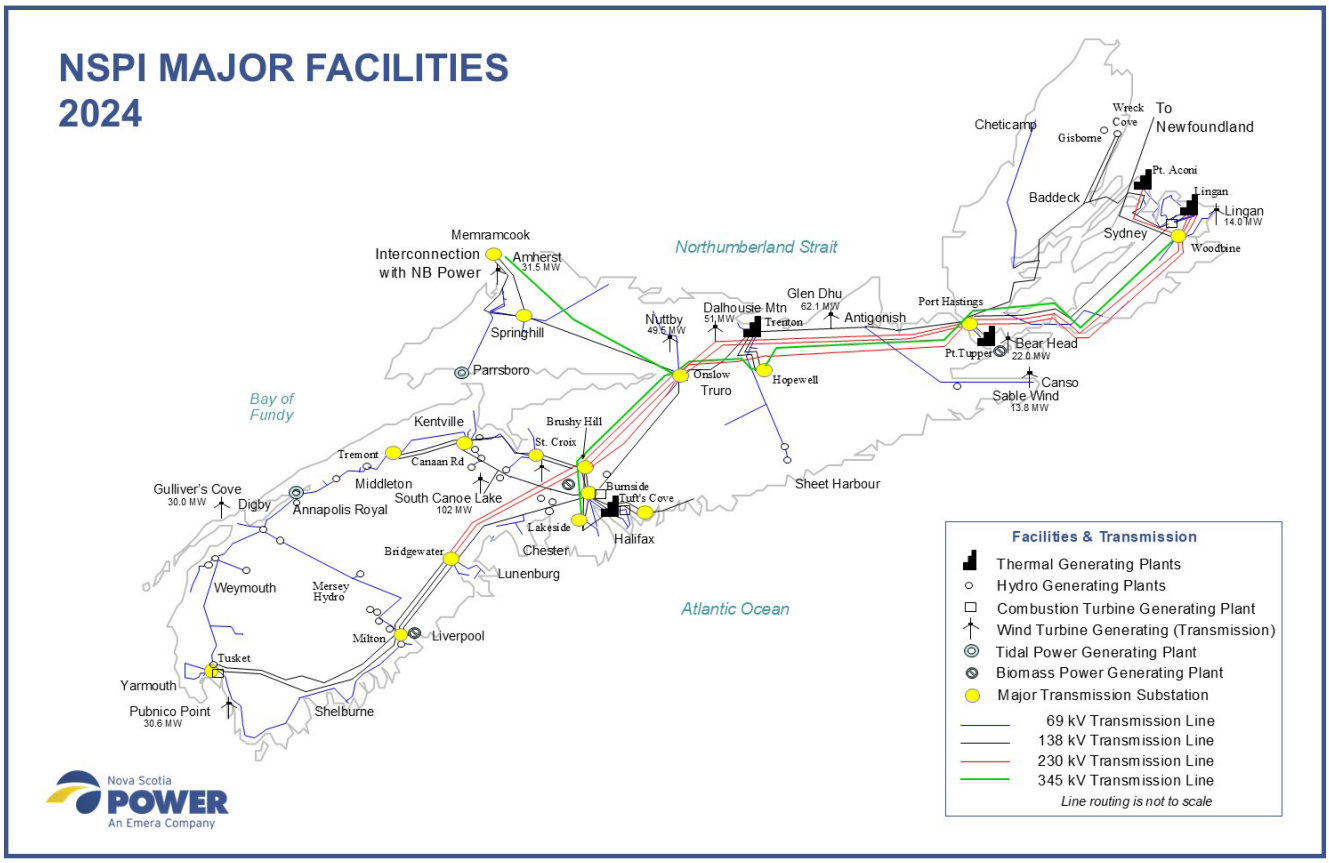

NSPI MAJOR FACILITIES
2024
Cheticamp
Wreck Cove
To Newfoundland
Gisborne
Pt. Aconi
Baddeck
Lingan
Lingan 14.0 MW
Sydney
Woodbine
Memramcook
Interconnection with NB Power
Amherst 31.5 MW
Northumberland Strait
Glen Dhu 62.1 MW
Dalhousie Mtn 51 MW
Trenton
Antigonish
Port Hastings
Nuttby 49.5 MW
Springhill
Parrsboro
Onslow
Truro
Hopewell
Pt. Tupper
Bear Head 22.0 MW
Canso
Sable Wind 13.8 MW
Bay of Fundy
Kentville
Brushy Hill
St. Croix
Tremont
Canaan Rd
Middleton
South Canoe Lake 102 MW
Gulliver's Cove 30.0 MW
Digby
Annapolis Royal
Burnside
Lut's Cove
Sheet Harbour
Lakeside
Halifax
Bridgewater
Chester
Lunenburg
Weymouth
Mersey Hydro
Atlantic Ocean
Milton
Liverpool
Tusket
Yarmouth
Pubnico Point 30.6 MW
Shelburne
Facilities & Transmission
Thermal Generating Plants
Hydro Generating Plants
Combustion Turbine Generating Plant
Wind Turbine Generating (Transmission)
Tidal Power Generating Plant
Biomass Power Generating Plant
Major Transmission Substation
69 kV Transmission Line
138 kV Transmission Line
230 kV Transmission Line
345 kV Transmission Line
Line routing is not to scale
Nova Scotia POWER
An Emera Company

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1.0 EXECUTIVE SUMMARY

The Nova Scotia Power Incorporated (NS Power, Company) Annual Capital Expenditure (ACE) Plan Application provides customers, the Nova Scotia Utility and Review Board (NSUARB, Board), and other stakeholders with a comprehensive and transparent overview of the Company's intended capital investments for the year ahead.

NS Power is focused on providing customers with safe and reliable electric service in a cost-effective manner. The capital investments proposed under the 2025 ACE Plan are aligned with these key objectives and continue to be vetted and planned in compliance with the NSUARB-approved Capital Expenditure Justification Criteria (CEJC).

NS Power's total capital budget for 2025 (inclusive of capital projects under $1,000,000 and Point Aconi projects,[1] as well as previously approved multi-year project profiles) is $692.4 million. In this Application, within the overall 2025 capital budget, NS Power is requesting NSUARB approval of 24 capital work orders with total project investment of $69.2 million and the 2025 capital routine program of $194.6 million for an aggregate total of $263.8 million.

The provincial government released its 2030 Clean Power Plan in October 2023, which aligns with NS Power's Evergreen IRP Action Plan & Roadmap Update, and these documents collectively outline various investments and actions required in meeting the 2030 Decarbonization Goals. The Company continues to engage with both the federal and provincial governments with a goal of meeting the 2030 decarbonization targets in a way that is as cost-effective as possible for customers. In accordance with the Board's 2024 ACE Plan directive, an update to NS Power's *The Path to 2030* report is provided as **Appendix H**.

In preparing its capital plans, NS Power utilizes its established asset management approach, and considers safety, reliability, climate change adaptation, and affordability, while incorporating the

[1] The Company will continue to operate under the current regulatory framework while preparing to comply with any new requirements once the relevant clauses of Bill 404 are proclaimed.

Company's decarbonization targets. The Company's asset management approach is detailed in **Section 3.0**.

Reliability and resiliency are areas that have been canvassed extensively in many proceedings recently, and the Board has issued several directives which are addressed in **Section 11.1.5**. The Company's approach to improving customer reliability is focused on balancing optimized investments with affordability for NS Power's customers. This means that in addition to the dedicated areas of scope and responsibilities for the Reliability Team (vegetation management, transmission line and distribution feeder inspection, capital project engineering, distribution standards, performance standards reporting and stakeholder engagement related to reliability), various teams across NS Power work closely together to prioritize and execute reliability programs that are aimed at driving reliability improvements for NS Power's customers and making the system more resilient in the face of climate change. In accordance with the Board's direction in the 2023 Performance Standards process, NS Power is preparing its Five-Year Reliability Plan to be filed by the end of the year, and respectfully requests the Board consider it as an exhibit in the 2025 ACE Plan proceeding.

The investments in the 2025 ACE Plan:

- Provide benefits in communities throughout the province, including reliability focused improvements on the transmission and distribution (T&D) system and response to reliability challenges arising from increasingly more severe weather. The focus within T&D is prioritizing capital investment for customer reliability, and these investments in targeted reliability projects include vegetation management, storm hardening and reliability upgrades, targeted device replacements, and grid modernization.

- Support NS Power's business priority of safe delivery of electricity service to customers. Safety compliance projects contained in the 2025 ACE Plan include projects such as upgrades to Hydro dam safety, fire suppression systems, and high energy piping.

- Continue to support ongoing environmental compliance, such as the maintenance of hydro and wind renewable energy resources, and the continued remediation of polychlorinated biphenyls (PCBs) containing equipment and management of asbestos through corresponding recurring capital programs aligned with regulation timelines.

- Align with planning for coal phase-out and achievement of the 80 percent renewable electricity standard by 2030. This includes making mindful investments to ensure continued reliability, in the face of increasing load demands, in thermal assets that may be retired or serve a different purpose by 2030.

The 2025 ACE Plan also addresses the directives arising from the 2024 ACE Plan Decision.[2]

In keeping with its practice in recent years, NS Power intends to host a technical conference following submission of the 2025 ACE Plan to address any questions following initial review by intervenors prior to the issuance of information requests (IR). NS Power respectfully requests that in establishing its schedule for the 2025 ACE Plan process, the NSUARB incorporate the Company's proposed technical conference prior to the date for the issuance of IRs.

[2] Please refer to Section 4.0.

2.0 2025 ACE PLAN STRUCTURE

The following provides an overview of how the 2025 ACE Plan is organized.

- **Section 3.0** – **Introduction** – This section provides a high-level summary of the overall expenditures in the 2025 ACE Plan, including a breakdown of expenditures into various categories such as sustaining and strategic capital, as well as a forecast of expenditures in those categories for the next five years.

- **Section 4.0** – **2024 ACE Plan Follow-Up** – This section addresses the status of items from the 2024 ACE Plan, including a list of capital items pending submission in 2024 from the 2024 ACE Plan, and the 2024 ACE Plan deferred and cancelled items.

- **Section 5.0** – **2025 ACE Plan** – This section provides a summary of 2025 capital expenditures. These include the list of projects for which NS Power is seeking approval, the list of projects forecast for subsequent submission, the list of projects with a value of less than $1,000,000, and the list of projects for the Point Aconi Generating station. NS Power is not seeking approval of those capital projects identified for subsequent submittal at this time. In addition, capital projects under $1,000,000 undertaken by large-scale utilities and Point Aconi projects[3] do not require NSUARB approval under the PUA; however, the Company includes them in its ACE Plan for informational purposes and to provide a complete picture of annual capital expenditures on NS Power's system.

- **Section 6.0** – **Generation** – This section lists all generation capital projects submitted for approval, as well as related carry-over spending. Generation assets generate electricity through a variety of methods and fuel sources, including hydro, coal, oil and gas, biomass, and wind.

[3] As above, the Company will continue to operate under the current regulatory framework while preparing to comply with any new requirements once the relevant clauses of Bill 404 are proclaimed.

- **Section 7.0** – **Transmission** – This section lists all transmission capital projects submitted for approval, as well as related carry-over spending. Transmission assets transmit electricity from the generation plants to the distribution system throughout the province. Transmission includes assets and equipment operating at 69 kV level or higher, and also includes substation assets.

- **Section 8.0** – **Distribution** – This section lists all distribution capital projects submitted for approval, as well as related carry-over spending. Distribution assets include equipment for delivering electric energy from substations to customers served at voltages below 69 kV.

- **Section 9.0** – **General Plant** – This section lists all general plant capital projects submitted for approval, as well as related carry-over spending. General plant assets include computer infrastructure and communication equipment, which comprise the majority of capital expenditures in this category. Other items such as office equipment, vehicles, telecom, construction equipment and buildings (except generating and substation facilities) are also included within this category.

- **Section 10.0** – **Routine Capital Program** – This section lists all routine capital items submitted for approval, by generation, transmission, distribution, and general plant. Routine capital items are recurring annual expenditures for replacement of equipment (like-for-like replacement), additions to existing equipment base resulting from system growth, and addition of customers to the system.

- **Section 11.0** – **Directives and Miscellaneous –** This section provides information in response to the various directives issued by the Board in respect to the Company's ACE Plan over the years as well as other miscellaneous information previously included in the Company's Application. The Board's directives include requests for information on cost minimization, contingency, transmission and distribution investment reliability impacts, and the ranking of projects submitted in the ACE Plan for approval.

The 2025 ACE Plan also includes the following information provided as separate appendices:

- **Confidentiality Matrix (Appendix A)** – The confidentiality matrix provides a listing of capital items submitted for approval, their attachments, and their confidentiality status so that the Board may evaluate the confidential portions of the ACE Plan. NS Power has minimized the information for which it seeks confidential treatment in this Application in order to facilitate transparency.

- **Listing of all 2025 ACE Plan projects in Excel format (Appendix B)** – This provides the Board and interested parties a convenient reference of all expenditures in 2025, regardless of whether they are submitted for approval in the ACE Plan. Details include Capital Item Numbers (CI #s), names, functional class, and investment details.

- **Updated Q3 Capital Reports (Appendix C)** – NS Power's Q3 capital reports, submitted to the NSUARB on November 6, 2024, have been updated with 2025 ACE Plan projects submitted for approval and subsequent submittal, and provided in Excel format. The updated Q3 capital reports provide a comprehensive listing of the status of all "active" projects (i.e., those that have been submitted to the NSUARB or referenced on the ACE Plan subsequent submittal list and are currently underway).

- **2017-2024 Contingency Report (Appendix D)** – In accordance with the Board's 2019-2024 ACE Plan directives, a complete listing of projects submitted for approval in 2017-2024 (either through or outside of the ACE Plan proceedings, including projects submitted for subsequent approval, but excluding U&U projects) that have been completed, including information as directed by the Board, is provided in Excel format. Further detail relating to this directive can be found in **Section 11.1.6**.

- **Cost Minimization Project Details (Appendix E)** – In accordance with the Board's 2021-2024 ACE Plan directives, supplemental specific project details are provided.

- **Capital Expenditure Justification Criteria Update (Appendix F)** – Updates have been made to the Capital Expenditure Justification Criteria (CEJC) to align with NS Power's System Design Criteria; a list of CEJC revisions, and updates in track changes for the Detailed and Summary CEJC are provided. In accordance with the Board's 2016 ACE Plan directive which requires stakeholder engagement of CEJC amendments prior to submission to the Board, NS Power engaged with stakeholders and a summary of the engagement is provided in **Section 4.1**.

- **Mersey Update (Appendix G)** – In accordance with the Board's 2023 and 2024 ACE Plan directives, a comprehensive update on the Mersey Hydro Redevelopment Project is provided.

- **Path to 2030 Update (Appendix H)** – In accordance with the Board's 2024 ACE Plan directives, an update on *The Path to 2030* report is provided.

3.0 INTRODUCTION

3.1 2025 ACE Plan Summary

The Company's overall 2025 capital budget (inclusive of capital projects under $1,000,000 and Point Aconi projects that do not require NSUARB approval, carryover spending, capital routines, and subsequent submittal items) is $692.4 million. Within the overall 2025 ACE Plan budget, NS Power is requesting NSUARB approval of 24 capital work orders and the 2025 capital routine program, for a total approval amount of $263.8 million.

Figure 1 and **Figure 2** below illustrate NS Power's overall capital budget for 2025 and total forecast capital spending for 2026 through to 2029, as well as NS Power's total annual capital expenditures by function. The forecast for 2026 through 2029 includes the total cost of the projects and does not include considerations for external funding that is not already in place. While external funding for these initiatives is expected, the levels cannot be forecast at this time.

Figure 1: NS Power Total Capital Investment: Historical, Budget and Forecast
(Millions of Dollars)



F = Forecast, B = Budget in above figure

Figure 2: Total Annual Capital Expenditures by Function

(Millions of Dollars)

Year	Actuals 2020	2021	2022	2023	2024 Q3F*	2024 ACE Budget	ACE Plan 2025	Forecast 2026	2027	2028	2029
Generation	$88.0	$157.7	$194.4	$147.0	$150.8	$142.1	$188.1	$257.6	$259.1	$218.3	$133.4
Transmission	43.9	56.9	56.2	97.8	124.9	89.6	256.5	467.7	466.8	340.6	194.9
Distribution	143.6	116.1	209.9	148.5	163.6	141.7	182.6	186.6	187.7	188.8	226.8
General Plant	40.9	56.9	79.6	57.8	60.0	59.7	65.1	85.9	80.1	81.7	66.2
Total	**$316.4**	**$387.6**	**$540.2**	**$451.1**	**$499.3**	**$433.1**	**$692.4**	**$997.7**	**$993.6**	**$829.5**	**$621.2**

Note: Totals may be off by $0.1M due to rounding.
*The 2024 Q3 Forecast includes actuals up to July and forecast amounts for the remainder of the year.

NS Power's capital investments in the 2025 ACE Plan focus on maintaining and improving existing system performance, as well as enabling Nova Scotia to achieve a lower carbon future with a target of 80 percent of the electricity in Nova Scotia coming from renewable sources by 2030. NS Power continues to make timely investments based on equipment condition and criticality to maintain the performance of assets for customers while in parallel continuing to develop and implement the investments that are necessary to positively transform the power system by the end of the decade.

Generation, transmission, distribution, and general plant projects in the 2025 ACE Plan are subject to the Board-approved project selection and asset management methodologies pursuant to Section 6.2 of the CEJC. All projects brought forward for approval and completion have been vetted to ensure each provides value to customers per the CEJC.

As shown in **Figure 3** and **Figure 4** below, the projected costs associated with Sustaining Capital, Energy Storage and Customer/Load Driven comprise the largest investment types for 2025. NS Power's investments toward sustaining the Company's assets, customer driven investments

required for load growth, and investments required by regulatory or environmental standards are forecast to remain relatively stable over the next five years. These figures are the Company's current forecast. The accuracy of these estimates will improve over time as new information informs the potential investments. In addition, the amounts listed for the ECEI Transmission Line and Synchronous Condenser do not include any assumptions for external funding. While external funding for these initiatives is expected, the levels cannot be forecast at this time, therefore the current forecast excluding external funding to complete these initiatives are provided.

Figure 3: Breakdown of Capital Forecast by Investment Type

(Millions of dollars)

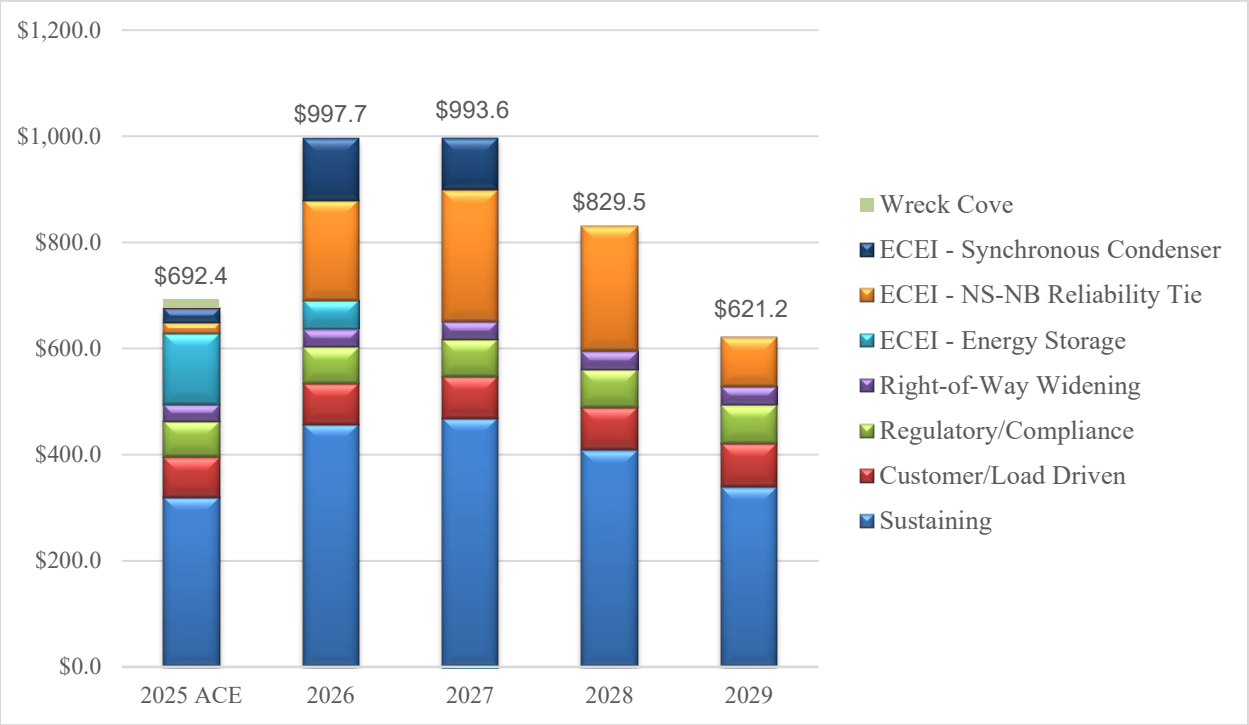


Figure 4: Breakdown of Capital Forecast by Investment Type
(Millions of Dollars)

Investment Type	2025	2026	2027	2028	2029
Sustaining	319.7	457.2	468.0	408.7	338.7
Customer/Load Driven	75.6	77.1	78.7	80.3	81.9
Regulatory/Compliance	67.3	68.6	70.0	71.4	72.8
Right-of-Way Widening	31.9	33.6	34.2	34.8	35.0
ECEI - Energy Storage	133.6	53.8	(3.3)	0.0	0.0
ECEI - NS-NB Reliability Tie	20.6	188.5	247.7	234.3	92.8
ECEI - Synchronous Condenser	27.2	118.2	98.4	0.0	0.0
Wreck Cove	16.5	0.7	0.0	0.0	0.0
	$692.4	**$997.7**	**$993.6**	**$829.5**	**$621.2**

Note: Totals may be off by $0.1M due to rounding.

Figure 5: Breakdown of Capital Forecast by Investment Type
(Millions of Dollars)

Investment Type	2025	2026	2027	2028	2029
Generation Reliability	188.1	257.6	259.1	218.3	133.4
T&D Reliability	196.6	224.0	241.6	242.7	264.4
New Customer	69.3	69.8	70.1	70.3	71.5
Core	57.0	85.9	80.1	63.8	59.2
ECEI - Energy Storage	133.6	53.8	(3.3)	-	-
ECEI - NS-NB Reliability Tie	20.6	188.5	247.7	234.3	92.8
ECEI - Synchronous Condenser	27.2	118.2	98.4	-	-
	$692.4	**$997.7**	**$993.6**	**$829.5**	**$621.2**

Note: Totals may be off by $0.1M due to rounding.

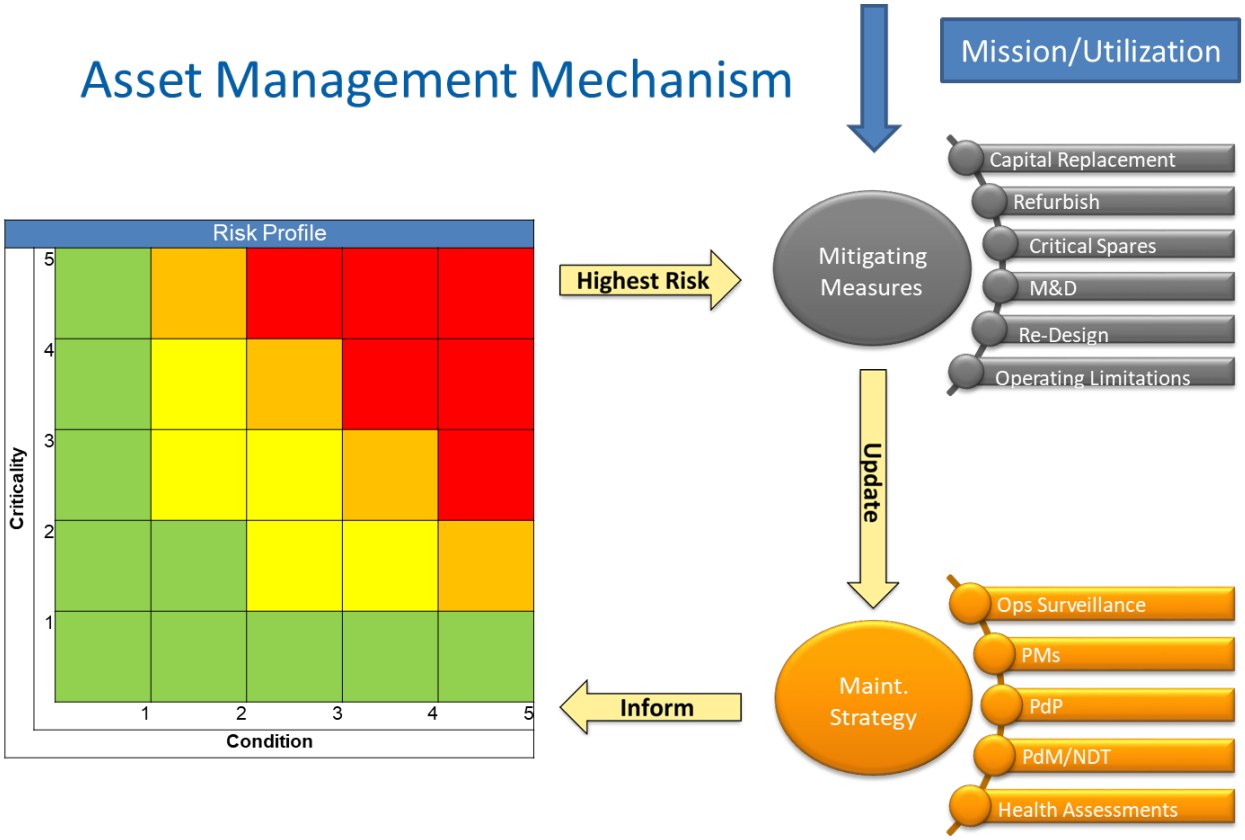
NS Power's Asset Management (AM) Mechanism, shown in **Figure 6**, illustrates how asset criticality and condition inform risk mitigation strategies. A clear understanding of asset criticality and condition (health) is necessary to determine the level of risk associated with an asset. Based on this evaluation, mitigating measures are adopted to address unacceptable risks. Mitigating measures are selected to address the primary risk drivers and may include capital investment, refurbishment, procurement of critical spares, monitoring and diagnostics activities, re-design, and/or modification to maintenance or operating practices.

Criticality is defined by the type and magnitude of the impact the asset may have on the organizational goals (the asset's "importance" or consequence of its failure). The types of impacts considered include safety, environmental and business sustainability (e.g. reliability and resiliency). While criticality does not change often, it may be altered in response to a change in an asset's or unit's "mission" (expected requirements for utilization). Details of the criteria used for assigning criticality are outlined in NS Power's Capital Expenditure Justification Criteria (CEJC) in the Asset Management Criticality and Condition Risk Alignment Matrix. Assets evaluated to have a risk rating of fifteen and up (shown in the risk matrix in red) carry risks which require a mitigation plan. Not all asset risks meeting this criterion require capital investment, and risks can sometimes be mitigated with other strategies as discussed above. In general, the higher the score (e.g. 20 or 25), the higher the priority for the asset to be given mitigation investment. For example, a Steam Turbine risk is likely to have a higher risk rating than a redundant pump due to the consequence of its failure (both safety and reliability impacts). In all cases, Subject Matter Expertise is applied to identify the type and timing of mitigating measure(s) to meet the operational mission of the asset.

Asset condition is informed by information available through maintenance strategies such as health indicators, condition-based monitoring measurements, asset performance as well as operational and investment history, and field-level knowledge and experience. **Figure 6** below provides a visual representation of this process.

NS Power's Enterprise Asset Management division and Asset Reliability Teams apply the Asset Management (AM) Mechanism to assess the risk associated with individual assets. The output of this mechanism is then used to optimize risk mitigation plans including capital investment ensuring asset mission is achieved and realizing the greatest value for customers.

Figure 6: Asset Management Mechanism



NS Power's long-standing commitment to a rigorous and well-integrated asset management approach was formalized earlier in 2024 within NS Power's Asset Management Policy.[4]

[4] M11771, NS Power Property & Asset Valuation Inquiry, NS Power letter dated June 28, 2024, Attachment 1.

3.2 Relief Sought from the Board

NS Power respectfully requests Board approval of the following, in accordance with Section 35A of the PUA:

- 24 Capital Items with 2025 budget investment of $41.0 million and total project investment of $69.2 million (please refer to **Section 5.2**); and
- Capital routine programs with 2025 budget investment of $194.6 million (please refer to **Section 10.1**).

In addition, NS Power requests:

- Board acceptance and approval of amendments to the CEJC detailed and summary versions, respectively.
- In establishing its schedule for the 2025 ACE Plan process, the NSUARB incorporate a technical conference prior to the date for the issuance of IRs.
- Consider the Five-Year Reliability Plan as an exhibit in the 2025 ACE Plan proceeding.

4.0 2024 ANNUAL CAPITAL EXPENDITURE PLAN FOLLOW-UP

This section addresses items arising from the 2024 ACE Plan. These items include a list of subsequent submittal capital items from the 2024 ACE Plan that are planned to be submitted before year-end, as well as items from the 2024 ACE Plan that have been deferred or cancelled.

The Board provided the following directives in its 2024 ACE Plan Order, all of which NS Power has complied with in the 2025 ACE Plan:

1. *File the CEATI report upon receipt.*[5] NS Power will file the CEATI benchmarking report upon receipt; based on the most recent update from CEATI, NS Power anticipates receiving the report by December 31, 2024.
2. *Consider the issue of developing better metrics and analysis to evaluate the cost-effectiveness of resiliency investments. These should be capable of both quantifying the expected benefits of a resiliency investment and measuring the effectiveness of that specific intervention once it is in place. NS Power is to provide this report to the Board in its 2025 ACE Plan application.*[6] Please refer to **Section 11.1.5**.
3. *Continue to study the issue of Normalized SAIDI and provide further information about potential alternatives to the manner in which Normalized SAIDI is presented, in the 2025 ACE Plan.*[7] Please refer to **Section 11.1.5**.
4. *Consider if there are alternative metrics to assess investments to address reliability in the context of proposed capital expenditures, and report back to the Board in the 2025 ACE Plan.*[8] Please refer to **Section 11.1.5**.
5. *File an update on The Path to 2030 in the ACE Plan on an annual basis until 2030.*[9] Please refer to **Appendix H**.

[5] M11458, NS Power 2024 Annual Capital Expenditure Plan, NSUARB Order, August 13, 2024, page 1.
[6] Ibid.
[7] Ibid.
[8] Ibid, page 2.
[9] Ibid.

6. *In its next depreciation study to be filed with the Board, NS Power is directed to include an updated capital cost estimate for the Mersey decommissioning option, complete with all assumptions used to develop the estimate. Further, after filing its depreciation study, NS Power is directed to also include an NPV analysis comparing the decommissioning option to the redevelopment option, complete with a description of all assumptions used in the analysis in its subsequent ACE Plan application.*[10] NS Power is mindful of the Board's direction, and will incorporate this information into its upcoming depreciation study and subsequent ACE Plan filings.

7. *Provide a comprehensive update on the Mersey Hydro System Redevelopment Project in its 2025 ACE Plan.*[11] Please refer to **Appendix G**.

8. *Continue to track the information noted in Paragraph 92 of the Board's 2020 ACE Plan decision for each completed capital project that was submitted for Board approval in 2017, 2018, 2019, 2020, 2021, 2022, 2023 and 2024 (either through or outside of the ACE Plan proceedings, including projects submitted for subsequent approval, but excluding U&U projects). Further the Board directs that the following information be included in the related 2025 ACE Plan reporting:*

   a) *Identification of all new projects that have been added to the Contingency Report (Appendix D);*

   b) *A summary table of Contingency Report (Appendix D) data, similar to Figure 90 in the 2024 ACE Plan application, organized by the year projects were placed in service;*

   c) *A summary table of Contingency Report (Appendix D) data, similar to NS Power's response to Figure 91 in the 2024 ACE Plan application, organized by the year projects were submitted for Board approval; and*

   d) *For any capital projects in the Contingency Report (Appendix D) that have a negative variance greater than or equal to 25% of the Board approved capital cost estimate, NS Power is to provide an explanation detailing the reasons for the variance.*

[10] Ibid.
[11] Ibid.

The Board directs NS Power to continue to track this information, including information related to projects approved by the Board after 2024, and report it in future ACE Plan applications. The Board directs that the data continue to be presented in the 2024 ACE Plan application Appendix D format in future ACE Plan applications. This reporting is to also categorize projects by function (i.e., generation, transmission, distribution, and general plant), with "generation" projects further categorized by type of project (i.e., hydro, steam, gas, other renewables).[12] Please refer to **Appendix D**.

9. *Revise NS Power's PDM to include a quality control step to verify that maturity matrices, risk registers, and other relevant documents are accurate and have been appropriately relied upon in reaching relevant conclusions. In its 2025 ACE Plan application, the Company is further directed to describe this quality control measure and explain how it will be used and managed internally.*[13] NS Power confirms that a quality control measure has been added to its Project Delivery Model (PDM). The quality control measure is in the form of a checklist, which will be required documentation for all capital work orders submitted for internal approval. This checklist will require the project owner to detail the elements of the PDM that they feel will be additive to the capital project being submitted, or to other capital projects in the future. This checklist will be reviewed by the capital planning team, who will confirm that the elements selected are sufficient, and all elements that could provide value to the project in review are selected. The capital planning team will add elements as requirements, if the appropriate ones are not selected initially.

10. *Include a separate contingency statement in the description page of its capital work order applications instead of using Note 3 in the detailed cost estimate. NS Power is directed to begin using this approach in its 2025 ACE Plan application.*[14] NS Power confirms this has been done for 2025 ACE Plan capital work orders, and will use this approach going forward.

[12] Ibid, pages 2-3.
[13] Ibid, page 3.
[14] Ibid.

4.1 Stakeholder Engagement – CEJC Update

There was no direction for stakeholder engagement in the Board's Order approving the 2024 ACE Plan. However, stakeholder engagement was required as a result of amendments to the CEJC and legacy 2016 ACE Plan directive to engage with stakeholders prior to submitting CEJC amendments to the Board.

In accordance with the NSUARB's legacy directive, on September 24, 2024 NS Power sent an email to the CA, SBA and IG, and appended a list of CEJC revisions, and updates in track changes for the Detailed and Summary CEJC. The updates to the CEJC are to ensure alignment with NS Power's System Design Criteria and are detailed in the list of CEJC revisions.

NS Power requested feedback from stakeholders by October 8, 2024. The SBA asked two questions via email on October 8, 2024, and NS Power subsequently responded to the SBA's questions on October 15, 2024 as follows:

1. Is the addition of #7 on page 108 consistent with the distinction between a "fault" and a "sag" as described in NS Power's application in M11656?

   NS Power's response: Yes. When a path to ground from a conductor (power line or equipment) is created (for example by lightning, an object like a tree branch, or equipment failure), the electrical current moves along that path to ground. This is referred to in industry, and our grid criteria, as a "fault". The voltage at ground is at or close to zero. From ground back to the generation source the voltage can be anywhere from 0 (at ground) to 100% (remote from the ground point) until the faulted equipment is separated from the grid. The term "sag" is more general and usually refers to a momentary drop in voltage level caused by, for example, a generator or reactive power device dropping offline, a short heavy demand of electricity such as for a large motor start, or an electrical "fault" as described above.

2. Does this addition limit what NS Power can do to prevent a sag as a result of a remote lightning strike?

NS Power's response: No. North American Electric Reliability Corporation (NERC) requires the documentation of Transient Voltage Criteria. As part of regular document review, it was determined that Transient Voltage Criteria (which included #7) was best suited to be incorporated into this document. It is not a change in criteria by NS Power. Grid response to transient lightening events (i.e. events that do not damage equipment that then needs to be removed from the grid by breaker action) is determined by the configuration of the grid in the area of the lightning event. In areas of the grid with numerous generators and a highly connected network, the area the voltage dip will typically be low. Areas of the grid with a limited transmission system at lower voltages and with few generation sources will see a more widespread and deeper voltage dip.

NS Power thanks stakeholders for their review and contributions during this process.

Please refer to **Appendix F**, which includes the list of CEJC revisions, and updates in track changes for the Detailed and Summary CEJC. NS Power requests acceptance and approval of the Detailed and Summary CEJC, respectively.

4.2 2024 Capital Items Pending Submission

The NSUARB provided the following directive in its 2017 ACE Plan Order:

> 9. The Board directs NSPI to include, as part of their annual ACE Plan submissions, a list of projects which appear as items for subsequent submission in a prior years' ACE Plan filing, which have not been submitted for approval at the time of an ACE Plan filing, but which NSPI intends to submit by the end of the calendar year.[15]

[15] M07745, NS Power 2017 Annual Capital Expenditure Plan, NSUARB Order, April 4, 2017.

Figure 7 sets out projects included in the 2024 ACE Plan as items for subsequent approval, but not yet submitted to the Board. NS Power has identified one subsequent submittal item that it anticipates will be filed with the NSUARB for approval by the end of 2024. This project will carry over into 2025 and total $1.2 million of 2025 forecast spending. These budget numbers were estimated at the time the 2025 ACE Plan was prepared and are subject to change as the scope and details of the project are refined.

Figure 7: Pending 2024 Subsequent Submittal Items

CI#	Project Title	2025 Budget ($)	Project Total ($)
Generation			
Hydro			
C0050414	HYD Roseway Asset Decommissioning	1,178,787	4,696,073
	This project is for the decommissioning of the Roseway hydro system assets to alleviate safety concerns and implement effective fish passage on the river system in conjunction with directives from DFO.		
	Total Capital Items for Subsequent Approval	**1,178,787**	**4,696,073**

4.3 2024 ACE Plan Subsequent Submittal List Status Update

Figure 8 below provides an update to the list of projects that were identified by NS Power in the 2024 ACE Plan for later submission for NSUARB approval.

Figure 8: Subsequent Submittal Project Status Update

		ACE 2024		Updated		
CI#	Project Title	2024 Budget ($)	Project Total ($)	2024 Budget ($)	Project Total ($)	Status
Generation						
C0050414	HYD Roseway Asset Decommissioning	3,482,677	4,650,648	2,392,970	4,696,073	Planned to be filed by end of 2024
C0053654	HYD Cowie Falls Generator Refurbishment	1,915,345	2,233,169	307,936	743,734	Project less than $1M
C0057361	HYD - ANN Facility Isolation	264,095	2,715,379	565,110	2,895,265	2025 ACE Plan Subsequent Submittal
C0041507	CT TUS1 Exhaust Stack Replacement	1,908,078	2,018,092	539,593	626,411	Project less than $1M
C0060323	PTMT-Coal Pile Modifications	505,505	3,211,624	844,869	944,365	Project less than $1M

Figure 8: Subsequent Submittal Project Status Update

		ACE 2024		Updated		
CI#	Project Title	2024 Budget ($)	Project Total ($)	2024 Budget ($)	Project Total ($)	Status
C0060816	POT - HFO Tank Refurbishment	2,012,803	2,012,803	3,281,070	3,281,070	Planned to be filed by end of 2024
Transmission						
C0044391	Eastern Clean Energy Initiative(ECEI) - Transmission	2,510,966	811,480,786	11,397,116	837,060,574	2025 ACE Plan Subsequent Submittal
C0021140	New 138KV-25KV Substation Stellarton	4,323,810	11,465,456	1,182,968	10,543,784	2025 ACE Plan Subsequent Submittal
C0032382	Susie Lake Substation Addition	2,485,097	2,740,945	214,362	5,701,709	2025 ACE Plan Subsequent Submittal
C0050838	2023 Substation Primary Equipment Spares	273,923	2,026,155	-	-	Cancelled
C0061552	L6043 Replacements and Upgrades	664,116	1,483,187	3,333	1,354,405	2025 ACE Plan Subsequent Submittal
C0053295	L5004 Kearney Lake Rebuild	1,392,174	1,464,209	192,979	1,178,094	2025 ACE Plan Submission
C0031286	Spare Padmounted Substation	34,010	1,319,838	14,675	1,298,926	Deferred
Distribution						
C0061521	New Distribution Rights-of-Way Phase 10	1,613,808	18,904,608	1,152,720	20,890,176	Approved
General Plant						
C0051815	2024 RTU Replacements Program Phase 6	2,331,325	5,735,653	229,149	5,862,710	2025 ACE Plan Submission
C0032664	ECC Optimization Tools Project	1,245,073	4,329,150	1,962,134	907,634	Project less than $1M
C0053699	Renewable to Retail Implementation	2,025,033	3,094,652	2,791,164	5,077,465	2025 ACE Plan Subsequent Submittal
C0061289	IT - Network Next Generation Security Design	820,758	2,632,635	840,943	840,943	Project less than $1M
C0054755	IT - Connect My Data (Green Button)	1,165,383	2,309,350	1,976,666	2,554,117	Approved
C0061284	IT - OT Cyber Security Control Implementation Phase 1	921,681	2,025,848	2,442,088	5,459,313	2025 ACE Plan Subsequent Submittal
C0061287	IT - Third Party Risk Management	1,105,970	1,405,970	-	-	Cancelled
C0061285	IT - Enterprise Governance, Risk and Compliance	893,547	1,163,547	245,802	1,178,391	2025 ACE Plan Subsequent Submittal
C0061286	IT - Enterprise Vulnerability Management	1,152,070	1,152,070	112,777	112,777	Project less than $1M

4.4 2024 ACE Plan Capital Items Deferred / Cancelled

NS Power's list of deferred and cancelled capital work orders relative to the 2024 ACE Plan is contained in **Appendix C**. Given the timing of the filing of this Application, **Appendix C** does not include 2024 ACE Plan Subsequent Submittal items that are planned to be submitted after this

Application has been filed and prior to 2024 year-end and does not include additional 2025 expenditures.

These 96 projects were originally included in the 2024 ACE Plan with a forecast investment of $24.6 million in 2024. Thirteen of these projects have been cancelled, while 83 have been deferred to future years. NS Power's asset management processes guide the Company's decisions related to project deferrals to ensure risks are being appropriately managed and capital investments are appropriately prioritized.

Of the 96 projects listed, no projects were included in the 2024 ACE Plan for approval. Seven of these projects were listed in the 2024 ACE Plan subsequent submittal list, to be filed separately as individual capital items, 89 projects were listed in the 2024 ACE Plan as projects under $1,000,000, and no projects were at Point Aconi.

5.0 2025 ANNUAL CAPITAL EXPENDITURE PLAN

5.1 Summary of Expenditures

Figure 9 below provides the proposed capital investment by category for NS Power's 2025 ACE Plan. This Application seeks NSUARB approval of the 2025 routine capital and 24 2025 projects, which total approximately $235.6 million of forecast investment in 2025. Certain items do not require NSUARB approval but are included in NS Power's annual capital plan for transparency and informational purposes. The 2025 ACE Plan budget also includes investment on multi-year projects that were previously approved by the NSUARB (Carryover Projects).

Figure 9: 2025 Capital Investments by Category
(Millions of dollars)

2025 ACE Spend	2025 NSUARB Approval Request	NSUARB Approval Not Required	Capital Items Forecast for Later Filing & Approval in 2024/2025	Previously Approved Capital Projects with 2025 Carryover	2025 ACE Plan
Capital Item Approval Sought through the 2025 ACE Process (Including Routine Capital Projects)	235.6				**235.6**
2024 ACE Plan Items Pending Submission in 2024			1.2		**1.2**
Capital Items Submitted for Later Approval in 2025			96.1		**96.1**
2025 Carryover Projects				262.3	**262.3**
Capital Items Less Than $1M		78.1			**78.1**
Point Aconi Capital Spend		19.1			**19.1**
2025 ACE Plan	**$235.6**	**$97.2**	**$97.3**	**$262.3**	**$692.4**

Note: NS Power is seeking approval of $194.6 million of routine investment in 2025.

Note: Figures presented in the ACE Plan document reflect rounding differences on some line items.

5.2 2025 ACE Plan Capital Items Submitted for Approval

Figure 10 below provides the list of 24 new Capital Items for which NS Power seeks NSUARB approval in the 2025 ACE Plan, totaling approximately $41.0 million of spending in 2025, with a total forecast investment of approximately $69.2 million.

Figure 10: 2025 Capital Items Submitted for Approval

Tab #	CI#	Project Title	2025 Budget ($)	Project Total ($)
Generation				
Hydro				
G01	C0048990	HYD AVO 2 Switchgear Replacement	1,254,513	1,814,631
G02	C0039266	HYD - Gulch Overhaul	962,156	1,371,379
		Total New Hydro Spending	**$2,216,669**	**$3,186,010**
Steam				
Turbine				
G03	C0068882	TUC1 Generator Refurbishment	1,869,353	2,124,211
G04	C0068887	TUC3 Turbine Valves Refurbishment	1,869,104	1,869,104
G05	C0068659	TRE5 - IP-LP Turbine Refurbishment	1,175,875	1,282,670
		Total New Steam Spending	**$4,914,332**	**$5,275,984**
		Total New Generation Spending	**$7,131,001**	**$8,461,995**
Transmission				
T01	C0031048	91H-T11 Transformer Replacement	5,837,478	6,914,622
T02	C0068961	2025 PCB Substation Sampling and Replacement	4,680,871	6,650,933
T03	C0069232	L6021 Replacements and Upgrades Phase 1	1,080,940	3,253,068
T04	C0069227	L6516 Replacements and Upgrades Phase 3	478,214	3,104,925
T05	C0069231	L8002 Replacements and Upgrades Phase 1	798,306	3,093,176
T06	C0070048	L5027B Replacements and Upgrades Phase 1	1,184,984	2,916,728
T07	C0053295	L5004 Kearney Lake Structure Replacement	1,101,784	2,478,537
T08	C0069238	2025/2026 Steel Tower Refurbishment	715,698	2,337,250
T09	C0057682	Spare Transformer Replacement	2,046,568	2,286,389
T10	C0050852	10V-T1 Transformer Replacement	1,933,466	2,113,337
T11	C0050834	Spare EHV Breaker Replacements	317,190	1,178,832
		Total New Transmission Spending	**$20,175,500**	**$36,327,796**

Figure 10: 2025 Capital Items Submitted for Approval

Tab #	CI#	Project Title	2025 Budget ($)	Project Total ($)
Distribution				
D01	C0068952	2025 PCB Poletop Sampling and Replacement	3,689,063	7,158,974
D02	C0068953	2025 PCB Light Replacement	3,900,672	4,225,224
D03	C0068954	2025 PCB Downline Device Sampling and Replacement	1,129,576	1,716,718
D04	C0068786	2025 Padmount Replacement Program	1,038,460	1,354,219
D05	C0070787	91W-411 Labelle Road Phase Extension	762,420	1,150,616
		Total New Distribution Spending	**$10,520,190**	**$15,605,752**
General Plant				
GP01	C0051815	RTU Replacements Program Phase 6	1,893,167	5,959,915
GP02	C0070907	MDR-8000 Microwave Radio Replacement	511,996	1,572,478
GP03	C0069270	2025 SCADA/EMS Upgrade	749,671	1,306,288
		Total New General Plant Spending	**$3,154,835**	**$8,838,681**
		Total New Capital Spending	**$40,981,526**	**$69,234,224**
		Total Routine Capital Spending	**$194,599,619**	**$194,599,619**
		Total Capital Items for which Approval is Sought	**$235,581,144**	**$263,833,843**

5.3 2025 ACE Plan Capital Items Forecast for Subsequent Approval

Figure 11 below identifies 2025 projects forecast in excess of $1 million that are not yet ready for submission to the NSUARB but which NS Power anticipates will be filed for review and approval in 2025. NS Power estimates approximately $96.1 million of investment in 2025 on these projects, which are currently estimated for total investment of approximately $1,237.8 million. The budget numbers indicated below are estimates as NS Power needs additional time to refine the specific project budget proposals. This section of the application is designed to provide an indication of these anticipated 2025 projects.

Figure 11: 2025 Capital Items Forecast for Subsequent Submittal

CI#	Project Title	2025 Budget ($)	Project Total ($)
Generation			
Hydro			
48913	HYD - Tusket Facility Refurbishment	1,093,904	12,972,226
	This project is for the structural stabilization and general refurbishment of the Tusket Powerhouse that has exceeded its expected useful life and now poses safety and security risks.		
C0057361	HYD - ANN Facility Isolation	210,689	2,899,094
	This project involves the long-term isolation of the Annapolis Generating Facility to prevent flooding.		
C0063803	HYD AVO 2 Access Road Stabilization	1,932,533	2,406,283
	This project is for the stabilization of the access road to Avon 2 Hydro Plant following washout during a heavy rain event in July 2023		
C0059783	HYD ULF 2 Overhaul	976,892	1,678,153
	This project includes the refurbishment of the 3MW unit at Upper Lake Falls Hydro plant on the Mersey River		
C0070486	HYD LGB Spillway Drawdown	1,121,577	1,288,404
	This project is to replace stoplogs, as well as address deteriorating concrete at the Lower Great Brook Sluiceway. These items are critical for continued safe water management of the Mersey River at this location		
	Total New Hydro Spending for Subsequent Approval	**$5,335,596**	**$21,244,160**
Gas Turbine			
C0068655	LM6000 191-332 Hot Section Refurbishment	5,913,584	6,013,454
	This project is for the refurbishment of components within the hot section of Engine 191-332.		
	Total New Gas Turbine Spending for Subsequent Approval	**$5,913,584**	**$6,013,454**
Steam			
C0069166	POT-Turbine Valve Refurbishment	2,529,633	2,872,598
	This project is for the disassembly, inspection, and refurbishment of the POT unit 2 High pressure and Reheat steam valves		
C0061484	PTMT - E-Crane Refurbishment	1,804,683	2,433,081
	This project is for the refurbishment of the E-Crane at the Point Tupper Marine Terminal, to allow for this E-Crane to reliably offload marine coal shipments.		
C0068566	LIN DCS Upgrade	1,300,715	1,440,911
	This project is to migrate the current, obsolete Demand Control System on one of the Lingan units to a new modern system.		

Figure 11: 2025 Capital Items Forecast for Subsequent Submittal

CI#	Project Title	2025 Budget ($)	Project Total ($)
C0067023	LIN2 2024/25 Capacity Requirement	371,610	1,083,800
	This project is for the component refurbishment and replacement of Lingan 2 assets to allow for the unit to be reliably available when system load requires.		
	Total New Steam Spending for Subsequent Approval	**$6,006,641**	**$7,830,389**
	Total New Generation Spending for Subsequent Approval	**$17,255,821**	**$35,088,003**
Transmission			
C0044391	Eastern Clean Energy Initiative (ECEI) - Transmission	20,641,301	800,229,290
	This project is for upgrades to transmission assets as part of the ECEI and the transition to 80% renewable electricity in Nova Scotia by 2030.		
C0072808	Synchronous Condensers (ECEI)	27,197,774	243,807,241
	This project includes the procurement and installation of Synchronous Condensers at four locations across Nova Scotia to support integrating increasing volumes of renewable energy generation.		
C0011358	New Bridgewater Substation	1,385,538	18,173,047
	This project is for the construction of a new distribution substation near highway 10 and Pine Grove Road to support load growth in the area, and improve system contingency capacity.		
C0032382	Susie Lake Substation Addition	5,149,415	13,954,518
	This project is for the construction of a new substation in the Susie Lake area of Bayer's Lake Business Park in Halifax		
C0021140	New 138KV-25KV Substation Stellarton	3,187,370	10,511,998
	This project will construct a new 138kV-substation in Stellarton to support load growth in the area and improve system contingency capacity		
C0053214	76W-T1 Transformer Replacement	1,938,848	2,279,295
	The 76W-T1 transformer, which currently operates at 69 kV to 4.6 kV with a capacity of 5 MVA and serves the town of Mahone Bay, will be replaced. The new transformer will be upgraded to a 69 kV to 13.2/4.16 kV unit with a capacity of 7.5/10/12.5 MVA.		
C0061552	L6043 Replacements and Upgrades	796,677	1,346,809
	This project is for the replacement of assets on L6043, 28.9 kilometer (150 structures) transmission line built in 1985 that connects 113H Dartmouth East and 87H Musquodoboit substations .		
C0041830	Spare Power Production Unit Transformer	1,258,324	1,264,622
	This project is for the purchase of a spare transformer to cover several unit transformers across the power production fleet that are considered higher risk. This spare will provide backup for a number of contingency scenarios		
	Total New Transmission Spending for Subsequent Approval	**$61,555,248**	**$1,091,566,821**

Figure 11: 2025 Capital Items Forecast for Subsequent Submittal

CI#	Project Title	2025 Budget ($)	Project Total ($)
Distribution			
C0071528	Fault Location, Isolation, Service Restoration (FLISR) Implementation *This project will install distribution protection devices to enable automatic feeder re-configuration for improved reliability.*	1,578,360	5,299,248
	Total New Distribution Spending for Subsequent Approval	**$1,578,360**	**$5,299,248**
General Plant			
C0021835	IT - CIS Replacement *This project will replace Nova Scotia Power's Customer Information System (CIS). The CIS system is critical to delivering customer care, billing and communications to customers. CIS needs to be replaced in order to address the risks associated with the existing software and to continue to deliver bills and serve customers reliably.*	2,243,592	77,890,771
C0061284	IT - OT Cyber Security Control Implementation *Operational Technology (OT) refers to the hardware and software that control and monitor the processes and physical devices used in the generation and delivery of electricity. This project will obtain alignment with enterprise cyber security practices through the assessment, definition and upgrade or implementation of cyber security mechanisms across the Operational Technology asset base. Implementation will be performed on a site-by-site basis, with groups of sites organized into projects.*	2,723,682	5,459,313
C0053699	Renewable to Retail Implementation *This project is required to provide mechanisms to enable Licensed Retail Suppliers (LRS) to leverage infrastructure for safe and reliable transmission and distribution of energy and to integrate with NS Power systems, and processes to provide seamless transition for impacted customers to comply with the NSUARB-issued Board Electricity Retailers Regulations and a Code of Conduct for Renewable Low-Impact Electricity Sales in Nova Scotia. Capital costs associated with the development and implementation of this project will be recovered from the LRS.*	1,505,726	5,062,652
C0068719	IT - Distributed Intelligence Apps *This project will evaluate, pilot, procure and deploy distribution intelligence solutions through the Advanced Metering Infrastructure (AMI) network meters. The implementation of these applications will enable precise analysis, advanced event detection and improve situational awareness of system conditions at the meter.*	2,086,440	4,353,461
C0047278	IT - Oracle MDM Upgrade *The Meter Data Management (MDM) System is nearing end-of-life and requires an upgrade to maintain vendor support. Upgrading the current version ensures vendor support is available; allows NS Power to apply newly released bug fixes, cybersecurity vulnerabilities or system patches that are released by the vendor; and ensures that new system features can be utilized as they are released by the vendor.*	912,789	3,010,689
C0068718	IT - DERMS Solution Project *This project will procure and implement a Distributed Energy Resource Management System (DERMS) allowing for the visibility, monitoring, control and optimization of distribution-connected energy resources on the power grid*	1,950,047	2,993,200

Figure 11: 2025 Capital Items Forecast for Subsequent Submittal

CI#	Project Title	2025 Budget ($)	Project Total ($)
C0032202	Sydney T&D Depot Consolidation *This project includes moving the Sydney T&D depot from the current Keltic Dr. location to NS Power's building on Townsend St.*	1,578,174	1,879,855
C0062624	IT - Mobile Field Connectivity Enhancements *The project will install Starlink mobility hardware on field workers' vehicles to ensure a steady internet connection, thereby enabling real-time data flow and efficient work distribution between field and office and enhancing safety and productivity.*	386,072	1,576,633
C0068714	IT - Identity & Access Management *This project will enhance NS Power's security infrastructure by transitioning the Company's existing Access Management, Privileged Access Management (PAM) and Identity and Access Management (IAM) tools to a new, advanced and streamlined software.*	963,267	1,275,524
C0061285	IT - Enterprise Governance, Risk and Compliance *This project will select and implement a software tool to optimize and automate NS Power's cyber security risk compliance processes. This tool will be used to govern, assess, and mitigate cybersecurity risks for Information Technology and Operational Technology assets in accordance with its Governance Risk and Compliance (GRC) framework.*	664,056	1,179,857
C0067863	IT - Managed Detect & Respond *This project will enhance NS Power's ability to manage, detect and respond (MDR) to cybersecurity threats by transitioning the Company's existing MDR cybersecurity solutions, including Security Incident and Event Management (SIEM), Network Detection and Response (NDR), Endpoint Detection and Response (EDR), and Threat Intelligence (TI) technology and services to a new, integrated toolset. This will streamline cybersecurity controls for NS Power Inc.*	668,280	1,126,413
	Total New General Plant Spending for Subsequent Approval	**$15,682,124**	**$105,808,368**
	Total Capital Items for Subsequent Approval	**$96,071,553**	**$1,237,762,439**

5.4 2025 ACE Plan Capital Items with Estimated Total Project Cost of Less Than $1,000,000

Historical dollar values and numbers of projects for capital items with a total project cost of less than $1,000,000 are provided in **Figure 12** and **Figure 13** below, respectively, in accordance with the agreement reached with stakeholders pursuant to NS Power's report provided to the NSUARB on September 5, 2017 (2017 stakeholder agreement).

Figure 12: Historical Value of Projects Less Than $1M
(Millions of dollars)

Value of Projects Less than $1M ($)				
Function	**2022**	**2023**	**2024**	**2025**
Gas Turbine	2.2	1.5	1.6	2.1
Steam	34.2	31.3	49.3	56.0
Hydro	5.1	3.5	6.6	4.8
Wind	0.5	0.6	0.3	1.5
Transmission	5.6	2.9	2.8	1.0
Distribution	11.7	5.6	5.1	9.2
General Plant	8.3	7.8	10.7	3.4
Total	$67.7	$53.2	$76.5	$78.1

Note: Totals in the tables above may be off due to rounding

Figure 13: Historical Number of Projects Less Than $1M

# of Projects Less than $1M				
Function	**2022**	**2023**	**2024**	**2025**
Gas Turbine	26	21	22	11
Steam	182	159	226	263
Hydro	20	13	15	15
Wind	3	2	2	3
Transmission	23	13	7	3
Distribution	49	27	17	22
General Plant	34	25	38	14
Total	337	260	327	331

A list of capital items with a total project cost of less than $1,000,000 is provided in **Appendix B**, tab 'Less than $1M'. These projects do not require NSUARB approval but are provided for transparency and informational purposes.

5.5 2025 ACE Plan Capital Items – Point Aconi Generating Station

Please refer to **Appendix B**, tab 'Pt. Aconi' for the Point Aconi capital projects for 2025. These projects do not require NSUARB approval but are provided for transparency purposes.[16]

[16] As noted above, the Company will continue to operate under the current regulatory framework while preparing to comply with any new requirements once the relevant clauses of Bill 404 are proclaimed.

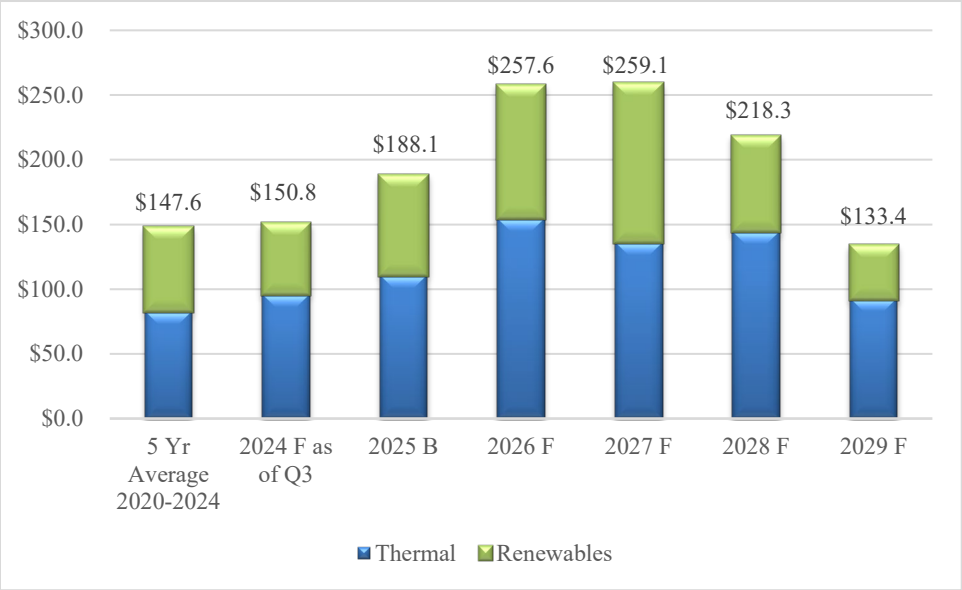
6.0 GENERATION

Generation capital includes replacements, refurbishments and additions to NS Power's Thermal, Hydro, Wind, Combustion Turbine and Biomass facilities.

Figure 14 below illustrates NS Power's capital investment on generation, including historical, forecast and budget. The increase in investment in 2026-2028 is largely attributable to an increase in major thermal outages along with larger Hydro dam safety projects.

Figure 14: Generation Investment – Historical, Forecast and Budget

(Millions of dollars)



F = Forecast, B = Budget in above figure

Figure 15 and **Figure 16** provide a breakdown of the 2025 generation investment by investment type.

Figure 15: 2025 Thermal Investment by Investment Type

(Millions of dollars)

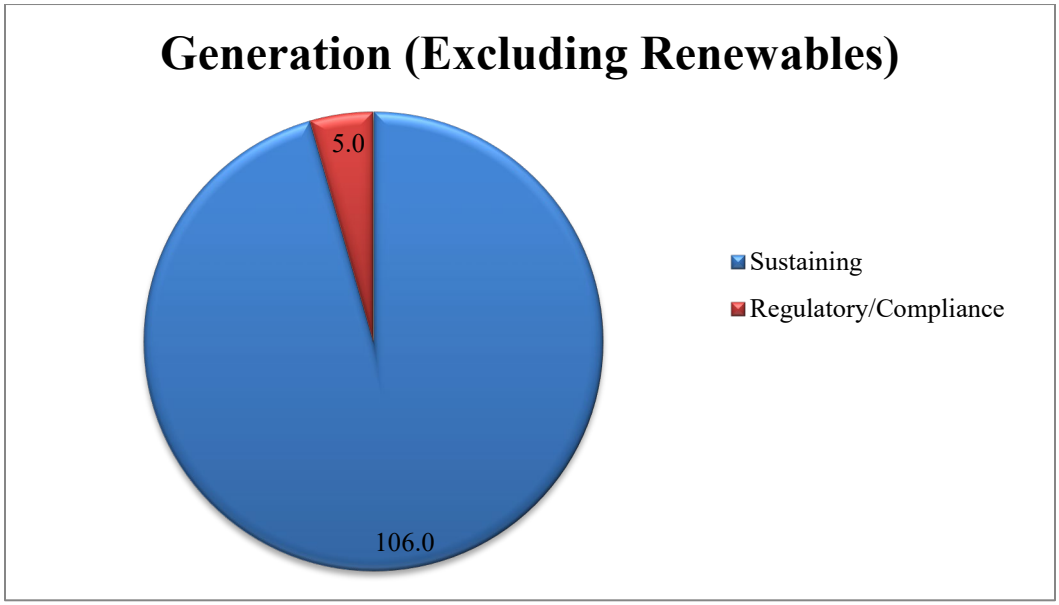
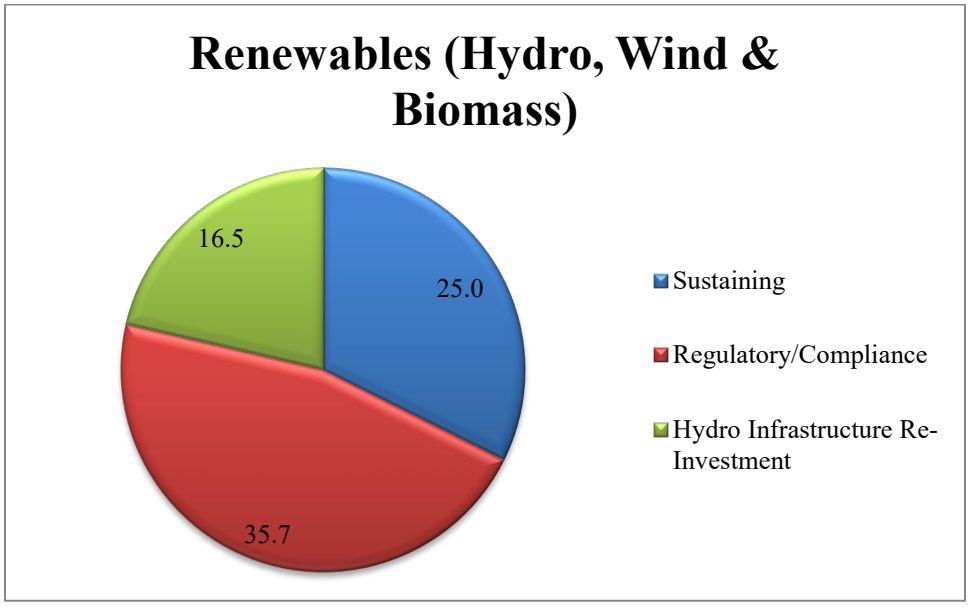


Figure 16: 2025 Renewable Generation Investment by Investment Type

(Millions of dollars)



The Company's asset health and risk profiling methodology determines the condition and criticality of equipment and allows the most appropriate risk mitigation strategy to be implemented, including effective investment of sustaining capital. NS Power's selection of generation related capital investment is based on the asset management approach as described in **Section 3.0** above and Section 6.2 of the CEJC. The approach enables NS Power to review and evaluate the information necessary to prioritize decisions to invest in assets when most effective to maintain safety and reliability, while managing affordability for customers. All of this is in context of the units' forecast utilization in the near to long-term. The Thermal Generation projects in the 2025 ACE Plan have been vetted according to the asset management methodologies with consideration of requirements to provide sufficiently safe and reliable generation performance in the near to medium term, while ensuring levels of investment are aligned with longer-term planning.

Key elements of NS Power's asset management approach include:

- fleet-wide asset class programs;
- application of the latest technologies to enhance understanding of asset health;
- effective operational support tools and infrastructure;
- risk-based inspection programs;
- development and review of best practices through industry organizations;
- nimble/responsive to changing requirements and emerging risks; and
- enterprise-wide approach to asset management.

NS Power's generation asset management approach is focused on optimizing the use of generation resources by mitigating risks through operating procedures and regular maintenance, monitoring and assessing asset condition and performance, and, when necessary, capital investment. The approach also focuses on continuing to develop and improve asset health assessment and risk profiling as the utilization of the generating fleet continues to evolve. NS Power engages industry experts to augment the assessment of risks and mitigating measures for the more complex assets within the generation fleet.

The focus for thermal generation capital investments in 2025 is on current requirements to provide for the safe, environmentally compliant, and reliable operation of the thermal assets based on utilization outlooks. The focus for renewable generation capital investments in 2025 is similar, with particular consideration given to the role they play with respect to achieving renewable energy and coal phase-out goals. The approximately $188 million generation capital investment plan for 2025 is summarized in **Figure 17** below.

Figure 17: Summary of 2025 Generation Capital Investments

(Millions of dollars)

i	New 2025 capital spending for projects with total estimated project spend greater than $1,000,000 and for which approval is sought. (As provided in Section 6.2)	7.1
ii	2025 capital spending for projects with total estimated project spending greater than $1,000,000 for which approval will be sought subsequent to the filing of the 2025 ACE Plan. (As provided in Section 5.3)	17.3
iii	New capital spending for projects with total estimated spending less than $1,000,000 for which approval is not sought. (As provided in Appendix B)	64.5
iv	2025 capital spending for projects included in the 2024 ACE Plan for which approval will be sought in late 2024. (As provided in Section 4.2)	1.2
v	Point Aconi Generating Station capital spending. (As provided in Appendix B)	19.0
vi	Carry-over capital spending. (As provided in Section 6.1)	72.0
vii	Routine capital spending. (As provided in Section 10)	7.1
	Total 2025 Generation Capital Investment Plan	188.1
	Request for ACE Approval (Items i and vii)	14.2

Note 1: Totals may be off due to rounding.

6.1 Generation – Carry-over Capital Spending Summary

Figure 18: Generation Carry-over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
Hydro Generation Plant							
C0013838	HYD WRC LEM Unit Rehabilitation and Replacement	2019/01	2026/02	93,432,164	9,356,145	708,120	103,496,429
29807	HYD - Tusket Falls Main Dam	2008/01	2029/12	25,326,239	2,165,510	44,324,694	71,816,443
C0014218	Wreck Cove Life Extension and Modernization (LEM) Project - Balance of Plant	2019/11	2025/12	20,419,347	7,136,068	-	27,555,415
16374	HYD - Gaspereau Dam Safety Remedial Works	2007/05	2027/12	12,089,041	1,206,182	7,117,485	20,412,708

Figure 18: Generation Carry-over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
C0006418	HYD WRC Tailrace Tunnel Rock Bolting Phase 2	2018/06	2026/12	1,697,727	12,267,054	1,820,894	15,785,675
50518	HYD - Ruth Falls Main Dam Refurbishment	2017/02	2026/12	4,219,699	8,283,749	2,517,224	15,020,672
51236	HYD WRC Tailrace Tunnel Rock Bolting Phase 1	2017/01	2025/12	6,632,063	1,966,113	-	8,598,176
C0012838	HYD - Lequille Canal Dyke, Gates and Tailrace Refurbishment	2018/10	2025/12	1,525,332	4,251,482	-	5,776,813
C0000979	HYD - Governor Dam Refurbishment	2017/11	2025/12	4,822,620	27,626	-	4,850,246
C0064966	Tusket Powerhouse Tidal Pool Fish Passage	2023/07	2026/01	387,291	594,972	-	982,263
C0038126	HYD - Cowie Falls Unit 12 Overhaul	2024/02	2026/03	361,127	596,310	-	957,437
49942	HYD - Tidewater Facility Refurbishment	2018/06	2026/12	77,460	799,190	72,513	949,162
C0053654	HYD Cowie Falls Generator Refurbishment	2022/09	2026/12	307,936	356,377	96,491	760,803
C0053657	HYD COW Filler Gate Replacements	2023/09	2025/09	722,607	33,773	-	756,380
C0019025	HYD - Sloane Dam Refurbishment	2019/05	2026/06	208,158	485,902	-	694,060
C0068344	HYD PCB Removal	2024/06	2027/02	45,330	350,351	289,634	685,315
49036	HYD - Avon 2 Controls Upgrade	2016/03	2026/12	40,324	391,178	64,791	496,293
C0038629	HYD - Ridge Surge Tank Refurbishment	2021/11	2026/05	2,464	416,413	-	418,877
C0067444	HYD COW Stop Log Replacements	2024/05	2025/12	348,732	25,797	-	374,529
C0062063	HYD - Dam Generator Procurement	2023/09	2025/12	259,111	77,195	-	336,306
C0058062	HYD Avon 2 Station Service Upgrade	2024/03	2026/04	18,018	317,253	-	335,271
C0049456	HYD ANN Safety Boom Replacement	2022/12	2025/11	205,731	123,634	-	329,365
C0042526	HYD ULF2 Stator Refurbishment	2024/07	2027/12	232,811	15,915	5,574	254,301
C0039446	HYD - EVH Door Replacements	2021/09	2026/04	169,190	78,993	-	248,183
C0067747	ANN Tidal - MCC Replacement	2024/01	2025/07	170,358	66,589	-	236,947
C0046830	HYD - Mersey Jordan Lake Communication Upgrades	2022/09	2026/05	91,345	101,169	-	192,514
C0042466	HYD STM Garage Refurbishment	2021/09	2026/02	13,630	133,437	-	147,067
C0038346	HYD - PAR Window Replacement	2021/09	2026/05	1,031	127,342	-	128,373
C0067443	HYD LGB Wall Bushing Replacement	2024/05	2026/12	6,514	55,219	8,176	69,909
Total Hydro Generation Plant				**$173,833,401**	**$51,806,937**	**$57,025,596**	**$282,665,933**

Figure 18: Generation Carry-over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
Steam Generation Plant							
C0060608	TUC6 Turbine Refurbishment	2024/01	2026/01	489,033	1,949,728	-	2,438,762
C0055155	TUC2 Stack Platform Replacement	2022/12	2025/06	280,551	684,011	-	964,563
C0060570	TUC1 AVR Replacement	2024/01	2026/05	496,985	453,297	-	950,282
C0060323	PTMT-Coal Pile Modifications	2023/07	2025/03	928,335	16,222	-	944,556
C0063559	PTMT Conveyor Refurbishment	2024/01	2025/12	420,203	521,935	-	942,139
C0069151	TUC WTP Tank 3 Cation Vessel Replacement	2024/08	2026/06	90,393	844,852	-	935,246
C0067183	TUC Wharf Structural Refurbishment 2024	2024/04	2026/04	101,634	825,893	-	927,528
C0060594	TUC6 Turbine Valves Refurb 2024	2024/05	2026/01	451,972	454,019	-	905,991
C0021982	ICP UU Unloading Hopper Replacement	2019/09	2025/12	566,815	199,387	-	766,202
C0052914	ICP Rail Center Fuel System Refurbishment	2023/03	2025/12	177,542	525,122	-	702,664
C0060598	TUC6 Heat Recovery Steam Generator Boiler Refurb 2024	2024/05	2026/02	83,466	612,261	-	695,727
C0060775	POT - South Boiler Feed Pump Refurbishment	2024/04	2025/07	16,083	530,536	-	546,619
C0063550	ICP Conveyor Take-Up Refurbishment	2024/10	2026/12	23,276	138,620	359,403	521,299
C0010324	TRE5 - Condenser Inlet Piping and Valve Replacement	2019/03	2025/12	6,563	442,488	-	449,052
C0050892	TUC - Elevator Upgrade	2023/01	2026/06	42,472	399,700	-	442,172
C0061376	TRE5 - 5-2 CW Pump Refurbishment	2024/01	2025/02	387,290	35,936	-	423,227
C0063555	ICP Chute Replacement	2024/01	2025/06	352,863	47,600	-	400,463
C0060776	POT- Polisher Valves Solenoid Panel Replacement	2024/01	2025/09	74,627	321,140	-	395,767
C0063405	ICP Locomotive Refurbishment 2024	2024/01	2025/03	221,790	153,137	-	374,927
C0021608	TUC Shoreline Sheetpile Refurbishment	2022/09	2026/04	165,947	191,264	-	357,211
C0060781	POT – Fuel Delivery Control & Instrumentation Refurbishment 2024	2024/03	2025/07	21,421	310,249	-	331,670
C0065823	TUC1 HP Gov Valve Replace 2024	2024/03	2026/03	108,711	221,928	-	330,639
C0068308	TUC3 4kv600v Breaker Replace 2025	2024/06	2025/10	800	321,376	-	322,176
C0067405	LIN4 UU FAC Refurbishment 2024	2024/05	2025/06	283,707	25,286	-	308,992
C0039028	LIN1 Ash Incline Refurbishment 2025	2022/02	2025/12	2,229	279,244	-	281,473
C0030702	LIN Bottom Ash Incline Belt Refurbishment	2022/02	2025/12	44,110	237,158	-	281,268
C0060812	POT- Water Treatment Plant MCC Upgrade	2024/01	2025/08	162,699	109,251	-	271,950
C0010331	TRE6 Precipitator Controls Upgrade	2022/03	2026/02	13,508	231,405	23,300	268,213
C0026862	LIN1 CW Pipe Refurbishment	2020/03	2025/12	47,987	195,077	-	243,064
C0061327	LIN Fly Ash Hopper Vibrator Replacement	2024/02	2026/01	71,530	158,861	-	230,392

Figure 18: Generation Carry-over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
51394	LIN3&4 Operator Control Panel Button Upgrade	2017/04	2025/12	7,956	218,791	-	226,747
C0039166	LIN CW Valve Refurbishment 2022	2022/01	2026/01	30,923	169,826	19,800	220,549
C0040186	TRE PCB Equipment Replacement	2021/06	2026/02	10,554	189,164	17,938	217,656
C0059624	AMO LIN1 Enhanced Monitoring	2024/05	2025/06	140,339	46,409	-	186,748
C0052113	ICP Main Storage Area Stormwater Management	2023/02	2025/12	86,400	99,489	-	185,889
C0060578	TUC2 Replace Air Foils	2024/08	2026/06	23,179	150,118	-	173,297
C0021882	LIN CW Control Panel Upgrades	2020/02	2025/12	11,163	160,260	-	171,423
C0060576	TUC1 Condensate Extract Pump Refurbishment	2024/04	2026/05	29,692	134,877	-	164,569
C0063552	ICP Pier Hydraulics & Elec Refurbishment	2024/04	2025/12	4,805	149,340	-	154,144
49657	TUC Sequence of Events Recorder Upgrade	2018/11	2026/05	25,272	108,707	-	133,979
C0041053	LIN Ladder Swing Gates 2022	2022/02	2025/12	71,628	49,944	-	121,572
C0069030	TUC Person Door Replacement	2022/04	2026/06	16,269	100,022	-	116,291
C0028123	LIN UU Dry Ash Unloading Refurb.	2020/04	2025/12	38,786	66,394	-	105,180
C0030482	LIN Wastewater System Instrumentation Replacement	2021/03	2025/12	30,587	46,662	-	77,249
C0041548	AMO TUC Relay Connectivity	2022/01	2025/12	3,141	48,690	-	51,832
C0028686	LIN1 Steam Drum Level Controls Upgrade	2021/01	2025/12	1,010	41,991	-	43,001
Total Steam Generation Plant				**$6,666,250**	**$13,217,668**	**$420,441**	**$20,304,359**
Gas Turbine Generation Plant							
C0029682	CT - VJ2 Generator Replacement	2022/01	2026/06	1,482,818	3,331,179	-	4,813,997
C0060707	CT BGT1 Generator Refurbishment	2024/02	2027/01	5,854	741,745	3,444,751	4,192,349
C0029690	CT - VJ2 - Control System Upgrade	2023/01	2026/05	82,924	882,848	-	965,772
C0030549	CT - VJ2 - Gen Control and Protect	2023/01	2026/05	102,834	260,182	-	363,016
C0050648	CT LM6000 Air Compressor	2023/01	2026/06	149,804	151,822	-	301,626
C0041510	CT VJ2 AC/DC Fuel Pump Replacement	2022/01	2026/04	18,349	109,170	(3,049)	124,470
C0041522	CT - Harden Control System Grounding	2022/01	2025/05	54,436	11,936	-	66,372
C0050652	CT VJ Unit 2 Vibration Monitoring and Protection	2023/01	2026/05	25,370	34,973	-	60,342
C0050651	CT VJ Unit 1 Vibration Monitoring and Protection	2023/01	2026/05	25,370	34,973	-	60,342
Total Gas Turbine Generation Plant				**$1,947,758**	**$5,558,827**	**$3,441,702**	**$10,948,287**

Figure 18: Generation Carry-over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
Wind Generation							
C0044030	WIN - DIG Haights Brook Crossing Replacement	2022/02	2025/12	286,024	1,379,804	-	1,665,828
Total Wind Generation Plant				**286,024**	**1,379,804**	**-**	**1,665,828**
Total Generation Carry-Over Spending				**182,733,433**	**71,963,236**	**60,887,738**	**315,584,407**

6.2 Generation – New 2025 Capital Items for ACE Plan Approval

Figure 19: Generation - New 2025 Capital Items for ACE Plan Approval

Tab #	CI#	Project Title	2025 Budget	Project Total
	Hydro Generation Plant			
G01	C0048990	HYD AVO 2 Switchgear Replacement	1,254,513	1,814,631
G02	C0039266	HYD - Gulch Overhaul	962,156	1,371,379
		Total Hydro Generation Plant	**$2,216,669**	**$3,186,010**
	Steam Generation Plant			
Turbine				
G03	C0068882	TUC1 Generator Refurbishment	1,869,353	2,124,211
G04	C0068887	TUC3 Turbine Valves Refurbishment	1,869,104	1,869,104
G05	C0068659	TRE5 - IP-LP Turbine Refurbishment	1,175,875	1,282,670
		Total Steam Generation Plant	**$4,914,332**	**$5,275,984**
	Total Generation New Spending		**$7,131,001**	**$8,461,995**

7.0 TRANSMISSION

Transmission includes items for replacement, reinforcement, or expansion of the transmission system, which transmits electrical energy from the generation plants to distribution substations throughout the province. Transmission includes assets and equipment operating at 69 kV or higher. NS Power operates over 5,000 km of transmission circuits and related protection, controls, and substation equipment. **Figure 20** below illustrates NS Power's capital investment in transmission, including historical, forecast, and budget.

Figure 20: Transmission Investment – Historical, Forecast and Budget

(Millions of dollars)

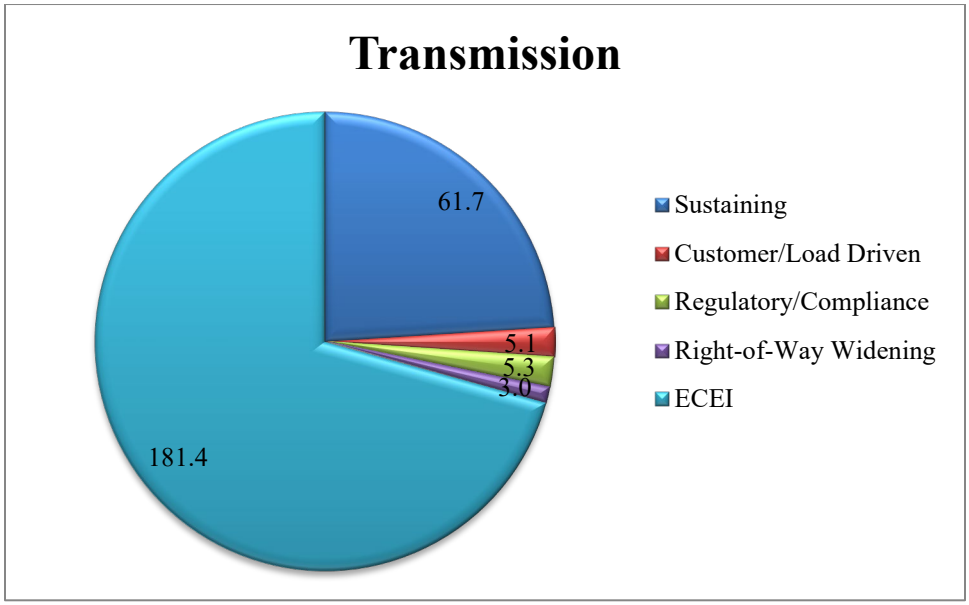


F = Forecast, B = Budget in above figure

Figure 21 provides a breakdown of the 2025 transmission investment by investment type.

Figure 21: 2025 Transmission Investment by Investment Type

(Millions of dollars)



Transmission investment is driven by the asset management approach as described in **Section 3.0** and Section 6.2 of the CEJC. The asset management approach evaluates both condition and criticality to determine the failure risk of different asset groups, resulting in prioritization for the maintenance, refurbishment, and replacement of these assets as appropriate. NS Power's asset management strategy and inspection program results for these assets feed into this evaluation process, aimed largely at sustaining capital investments. Please refer to **Section 11.1.5** for additional detail on NS Power's strategy related to reliability.

The focus for transmission capital investments in 2025 is on sustaining and improving system reliability. The approximately $257 million transmission capital investment plan for 2025 is summarized in **Figure 22** below.

Figure 22: Summary of 2025 Transmission Capital Investments

(Millions of dollars)

i	New 2025 capital spending for projects with total estimated project spend greater than $1,000,000 and for which approval is sought. (As provided in Section 7.2)	20.2
ii	2025 capital spending for projects with total estimated project spending greater than $1,000,000 for which approval will be sought subsequent to the filing of the 2025 ACE Plan. (As provided in Section 5.3)	61.6
iii	New capital spending for projects with total estimated spending less than $1,000,000 for which approval is not sought. (As provided in Appendix B)	1.0
iv	Carry-over capital spending. (As provided in Section 7.1)	155.8
v	Routine capital spending. (As provided in Section 10)	18.0
	Total 2025 Transmission Capital Investment Plan	256.5
	Request for ACE Approval (Items i and v)	38.2

Note 1: Totals may be off due to rounding.

7.1 Transmission – Carry-over Capital Spending Summary

Figure 23: Transmission Carry-Over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
Transmission Plant							
C0045132	Battery Energy Storage System Project	2022/06	2028/06	53,660,730	133,567,294	50,549,718	237,777,742
C0053316	Transmission Customer Performance Regulations Compliance Project – Michelin Waterville Dynamic Voltage Restorer	2022/08	2025/06	31,265,628	654,117	-	31,919,745
C0062123	143H-Mount Uniacke Substation	2024/01	2026/06	3,112,962	2,122,576	3,802,691	9,038,229
C0041788	L6516 Replacements and Upgrades Phase 2	2023/08	2026/12	3,145,043	1,928,774	385,397	5,459,214
C0061545	L6006 Replacements and Upgrades	2024/04	2026/02	2,762,834	1,113,189	1,313,189	5,189,212
C0061550	L5031 Replacements and Upgrades - Hubbards to East Chester	2024/08	2026/09	738,094	1,274,730	2,549,460	4,562,284
C0056240	2024/2025 Transmission Switch and Breaker Replacements	2023/08	2026/12	1,884,137	270,595	1,818,191	3,972,923
C0055796	2023 EHV Breaker Replacements	2022/12	2026/09	111,074	1,541,182	1,869,417	3,521,673
C0061551	L7009 Replacements and Upgrades	2024/04	2026/12	4,475	1,389,540	1,801,661	3,195,675
C0031122	L6539 Replacements and Upgrades	2021/01	2025/11	1,242,021	1,529,843	-	2,771,864
C0061403	2024 2025 Sacrificial Anode Installation Program	2024/02	2026/02	1,476,551	788,891	228,924	2,494,365
C0052299	2023/2024 Steel Tower Life Extension	2023/04	2026/12	767,697	898,085	607,323	2,273,105
C0050842	2024 Bulk Oil Breaker Replacement Program	2023/05	2026/12	371,123	950,241	798,628	2,119,992
C0061547	L7022 Replacements and Upgrades	2024/07	2025/12	1,013,874	1,015,899	80,000	2,109,773
C0041791	L6551 Replacements and Upgrades	2022/06	2026/12	106,852	808,668	1,143,719	2,059,239
C0050835	2023/2024 Steel Tower Refurbishment	2023/02	2025/12	1,173,287	875,812	-	2,049,100
C0061546	L6514 Replacements and Upgrades	2024/05	2026/02	881,135	800,114	111,000	1,792,249

Figure 23: Transmission Carry-Over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
C0041807	L5534 Replacements and Upgrades	2023/03	2025/04	1,467,522	277,404	-	1,744,926
C0057882	2024 Pennsylvania Breaker Replacements	2023/09	2026/12	512,224	142,591	690,313	1,345,127
C0041804	2022 Line Retirement Program	2022/01	2026/01	340,912	910,874	-	1,251,786
C0061387	2024 2025 Wood Pole Retreatment Program	2024/07	2026/12	404,405	511,730	256,422	1,172,558
C0067112	L5012 Replacements and Upgrades	2024/05	2026/01	784,442	112,598	89,788	986,828
C0052654	L5541 Water Crossing Upgrades	2023/05	2026/07	-	599,013	299,506	898,519
C0061743	L6038 Realignment	2024/02	2026/06	153,308	468,823	234,412	856,543
C0067111	L5023 Rebuild	2024/05	2025/08	679,105	147,876	-	826,981
C0061883	129H - Kearney Lake Substation Rebuild	2024/03	2026/03	633,142	113,241	50,651	797,034
C0041812	L6040 Replacements and Upgrades	2022/07	2026/06	9,137	445,437	222,718	677,291
C0043010	2022/2023 Wood Pole Retreatment Program	2022/05	2025/12	577,127	79,470	-	656,597
C0031268	AMO Critical Equipment Online Monitoring	2021/03	2025/07	397,837	34,543	-	432,380
C0031044	67N-713 230 kV Breaker Replacement	2021/04	2025/12	622	430,000	-	430,622
Total Transmission Carry-Over Spending				**$109,677,300**	**$155,803,149**	**$68,903,128**	**$334,383,578**

7.2 Transmission – New 2025 Capital items for ACE Plan Approval

Figure 24: Transmission - New 2025 Capital Items for ACE Plan Approval

Tab #	CI#	Project Title	2025 Budget	Project Total
	Transmission Plant			
T01	C0031048	91H-T11 Transformer Replacement	5,837,478	6,914,622
T02	C0068961	2025 PCB Substation Sampling and Replacement	4,680,871	6,650,933
T03	C0069232	L6021 Replacements and Upgrades Phase 1	1,080,940	3,253,068
T04	C0069227	L6516 Replacements and Upgrades Phase 3	478,214	3,104,925
T05	C0069231	L8002 Replacements and Upgrades Phase 1	798,306	3,093,176
T06	C0070048	L5027B Replacements and Upgrades Phase 1	1,184,984	2,916,728
T07	C0053295	L5004 Kearney Lake Structure Replacement	1,101,784	2,478,537
T08	C0069238	2025/2026 Steel Tower Refurbishment	715,698	2,337,250
T09	C0057682	Spare Transformer Replacement	2,046,568	2,286,389
T10	C0050852	10V-T1 Transformer Replacement	1,933,466	2,113,337
T11	C0050834	Spare EHV Breaker Replacements	317,190	1,178,832
	Total Transmission New Spending		**$20,175,500**	**$36,327,796**

8.0 DISTRIBUTION

Distribution includes replacement of, and additions to, equipment for delivering electricity from points on the transmission system to customers served at voltages below 69 kV. NS Power operates approximately 28,000 km of distribution circuits and related protection, controls, and transformers. **Figure 25** below illustrates NS Power's capital spending on distribution, including historical, forecast and budget.

Figure 25: Distribution Investment – Historical, Forecast and Budget
(Millions of dollars)

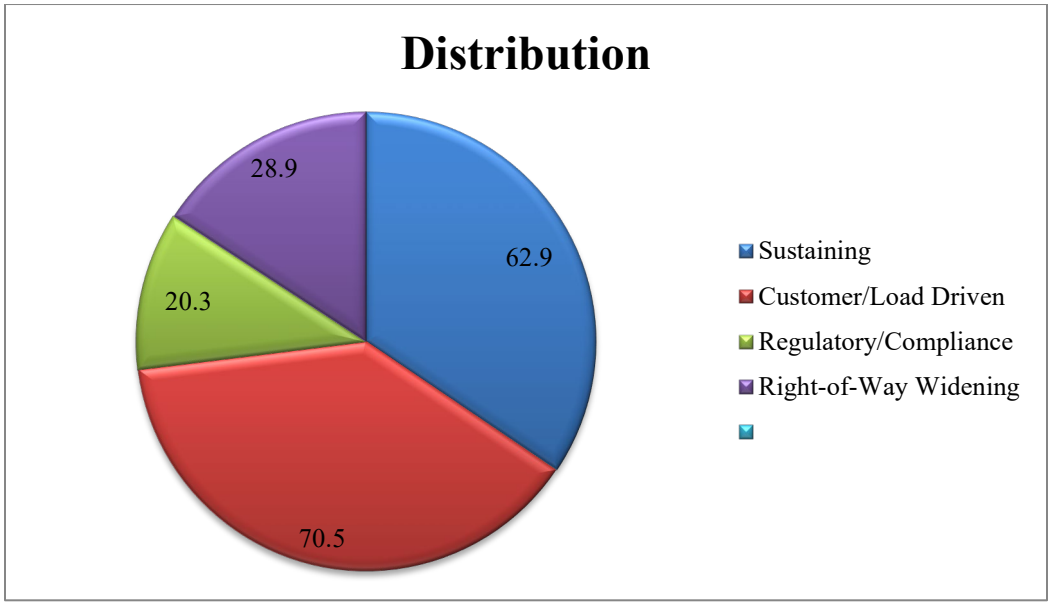


F = Forecast, B = Budget in above figure

Figure 26 provides a breakdown of the 2025 distribution investment by investment type.

Figure 26: 2025 Distribution Investment by Investment Type

(Millions of dollars)



Similar to Transmission investment, Distribution investment is driven by the asset management approach as described in **Section 3.0** above and Section 6.2 of the CEJC. The asset management approach evaluates both condition and criticality to determine the failure risk of different asset groups, resulting in prioritization for the maintenance, refurbishment, and replacement of these assets as appropriate. NS Power's asset management strategy and condition assessments feed into this evaluation process, aimed largely at sustaining capital investments. Please refer to **Section 11.1.5** for additional detail on NS Power's strategy related to reliability.

The focus for Distribution capital investments in 2025 continues to reflect localized customer load growth and customer reliability. The approximately $183 million Distribution capital investment plan for 2025 is summarized in **Figure 27** below.

Figure 27: Summary of 2025 Distribution Capital Investments

(Millions of dollars)

i	New 2025 capital spending for projects with total estimated project spend greater than $1,000,000 and for which approval is sought. (As provided in Section 8.2)	10.5
ii	2025 capital spending for projects with total estimated project spend greater than $1,000,000 for which approval will be sought subsequent to the filing of the 2025 ACE Plan. (As provided in Section 5.3)	1.6
iii	New capital spending for projects with total estimated spending less than $1,000,000 for which approval is not sought. (As provided in Appendix B)	9.2
iv	Carry-over capital spending. (As provided in Section 8.1)	25.1
v	Routine capital spending. (As provided in Section 10)	136.1
	Total 2025 Distribution Capital Investment Plan	182.6
	Request for ACE Approval (Items i and v)	146.6

Note 1: Totals may be off due to rounding.

8.1 Distribution – Carry-over Capital Spending Summary

Figure 28: Distribution Carry-Over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
Distribution Plant							
47124	Advanced Metering Infrastructure	2015/01	2025/06	143,150,133	749,120	-	143,899,252
C0061521	New Distribution Rights-of-Way Phase 10	2024/09	2026/09	1,152,720	16,372,529	3,184,810	20,710,059
C0008638	D-Cogswell HRM Redevelopment Program	2018/07	2025/12	4,767,546	1,667,138	-	6,434,685
C0022662	22C-404GA Lennox Passage Rebuild	2019/11	2025/04	2,240,161	259,698	-	2,499,859
C0031117	2H-411-Prospect Rd Phase Extension	2022/04	2026/02	555,824	410,157	75,857	1,041,838
41350	16W-301 Hebron Rebuild Phase 2	2017/05	2025/03	653,911	268,429	-	922,340
C0060749	2024 Padmount Replacement Program	2024/03	2026/01	514,510	272,486	92,345	879,342
52184	37N-412 Glooscap Trail Rebuild Phase 2	2017/09	2025/06	616,489	243,181	-	859,670
C0033444	63V-312 Stronach Mountain Phase Extension	2021/06	2025/12	346,972	458,333	-	805,305
49841	23H-Rockingham Voltage Conversion-Phase 2	2017/01	2025/02	668,136	96,791	-	764,927
C0043490	2022 Downline Asset PCB Replacements	2022/01	2025/09	288,540	372,622	-	661,162
C0061384	512W-311-Lake Torment Loading Issue	2024/02	2025/10	58,514	512,051	45,899	616,463
C0042846	15C-211 - Deepdale Conversion	2022/01	2025/12	58,503	490,752	-	549,255
C0011189	2H-411 - Cowie Hill UG System Replacements Part 3	2019/05	2025/07	192,829	315,834	-	508,664
C0042186	100C-421 - Harvre Boucher Rebuild	2022/06	2025/12	51,660	455,047	-	506,707
C0031402	559W-331 Molega Lake Rd Conversion	2022/01	2025/12	8,852	438,722	34,504	482,078
C0015198	50V Kentville Aluminum Light Pole Replacement	2019/05	2025/12	238,762	169,188	54,000	461,949
C0041955	2022 Hydraulic Recloser Replacements	2022/01	2025/05	385,954	48,216	-	434,170

Figure 28: Distribution Carry-Over Capital Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
C0041953	2022 Recloser Remote Connectivity	2022/01	2025/12	363,041	39,649	-	402,691
C0061385	5N-301-Debert Stepdown Replacement and Reconfiguration	2024/04	2025/08	107,117	262,489	-	369,606
C0061266	19C-204 - Durells Island Conversion	2024/03	2025/12	-	365,475	-	365,475
C0004138	50W-412GA Port Medway Line Extension	2021/11	2025/12	196,532	161,531	-	358,063
C0053517	9H-221 University Ave and Morris St Conversion	2023/02	2025/11	251,221	67,099	37,000	355,319
C0060750	2024 Vault Replacement	2024/03	2025/05	204,935	90,706	30,455	326,096
C0033507	Underground Switch Replacements	2020/11	2025/03	165,597	125,510	-	291,106
C0031300	9H-223 North St Conversion	2021/05	2025/12	18,732	226,688	-	245,420
C0050846	2023 Hydraulic Recloser Replacements	2024/01	2025/10	84,134	147,578	-	231,712
C0060751	2024 Manhole Automatic Pumps	2024/03	2025/02	75,949	18,495	-	94,443
Total Distribution Carry-Over Spending				**157,417,274**	**25,105,514**	**3,554,870**	**186,077,657**

8.2 Distribution – New 2025 Capital Items for ACE Plan Approval

Figure 29: Distribution - New 2025 Capital Items for ACE Plan Approval

Tab #	CI#	Project Title	2025 Budget	Project Total
	Distribution Plant			
D01	C0068952	2025 PCB Poletop Sampling and Replacement	3,689,063	7,158,974
D02	C0068953	2025 PCB Light Replacement	3,900,672	4,225,224
D03	C0068954	2025 PCB Downline Device Sampling and Replacement	1,129,576	1,716,718
D04	C0068786	2025 Padmount Replacement Program	1,038,460	1,354,219
D05	C0070787	91W-411 Labelle Road Phase Extension	762,420	1,150,616
	Total Distribution New Spending		**$10,520,190**	**$15,605,752**

9.0 GENERAL PLANT

General Plant includes information technology, computer infrastructure, operational technology (OT), and communication equipment, which comprise the majority of capital expenditures incurred under this function. Other items such as office equipment, vehicles, and construction equipment are also included. General Plant also includes buildings with the exception of generating and substation facilities. General Plant infrastructure investment is required to sustain and enhance NS Power's cross-functional foundational tools and facilities that are critical to continue to provide safe, reliable, and cost effective energy to customers. **Figure 30** below illustrates NS Power's capital investment in General Plant, including historical, forecast, and budget.

Figure 30: General Plant Investment – Historical, Forecast and Budget

(Millions of dollars)

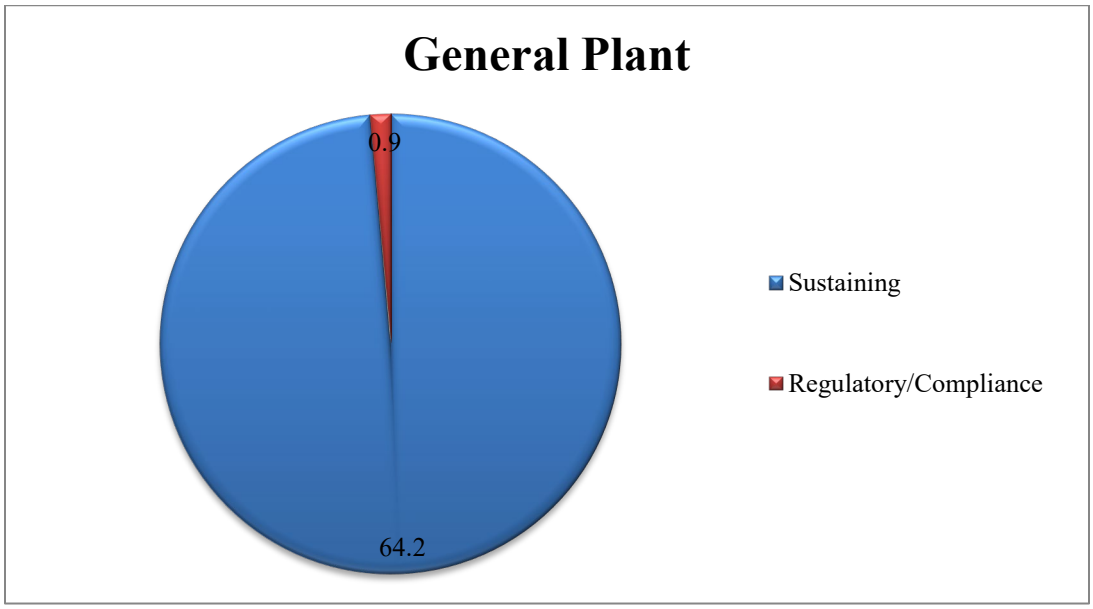


F = Forecast, B = Budget

Figure 31 provides a breakdown of the 2025 general plant spend by investment type.

Figure 31: 2025 General Plant Spend by Investment Type

(Millions of dollars)



General plant capital investment in 2025 is primarily in Information Technology and Operational Technology. The approximately $65 million general plant capital investment plan for 2025 is summarized in **Figure 32** below.

Figure 32: Summary of 2025 General Plant Capital Investments

(Millions of dollars)

i	New 2025 capital spending for projects with total estimated project spending greater than $1,000,000 and for which approval is sought. (As provided in Section 9.2)	3.2
ii	2025 capital spending for projects with total estimated project spending greater than $1,000,000 for which approval will be sought subsequent to the filing of the 2025 ACE Plan. (As provided in Section 5.3)	15.7
iii	New capital spending for projects with total estimated spending less than $1,000,000 for which approval is not sought. (As provided in Appendix B)	3.4
iv	Point Aconi Generating Station capital spending. (As provided in Appendix B)	0.1
v	Carry-over capital spending. (As provided in Section 9.1)	9.5
vi	Routine capital spending. (As provided in Section 10)	33.3
	Total 2025 General Plant Capital Investment Plan	65.1
	Request for ACE Approval (Items i and vi)	36.5

Note 1: Totals may be off due to rounding.

9.1 General Plant – Carry-Over Capital Spending Summary

Figure 33: General Plant - Carry-Over Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
C0021109	2020 RTU Deployment Project	2020/10	2025/07	6,935,339	342,065	-	7,277,404
C0011378	Route Network Upgrade	2019/07	2025/12	5,763,818	454,331	-	6,218,148
C0029928	AMO Weymouth Telecom Upgrade	2021/01	2025/09	150,076	106,874	-	256,950
C0020339	AMO - Risk Repository Tool	2022/10	2025/12	100,133	73,518	-	173,651
C0021133	SCADA Mobile Application	2020/06	2026/02	-	56,120	104,435	160,555
	Total Telecommunications			**$12,949,365**	**$1,032,908**	**$104,435**	**$14,086,708**
C0049619	IT - ERP Upgrade (EBS, PS, PP, OBIA)	2023/01	2025/12	4,214,077	1,102,097	-	5,316,174
C0047277	IT - GIS Utility Network Upgrade	2022/07	2026/03	2,276,500	2,646,483	-	4,922,983
C0056461	IT - Contact Centre Cloud Migration	2023/04	2026/01	1,253,380	1,499,989	364,685	3,118,055
C0054755	IT - Connect My Data (Green Button)	2022/12	2025/06	2,416,318	141,510	-	2,557,828
C0061323	IT - Data Storage Arrays	2024/01	2026/07	27,691	783,929	175,000	986,620
C0047190	IT - Drupal Upgrade	2022/08	2025/08	854,550	113,753	-	968,303
C0042169	IT - Arc FM Designer Upgrade	2023/11	2026/06	475,208	369,004	120,000	964,211
C0022002	IT- Storm Centre Upgrade	2024/01	2026/07	14,418	637,238	195,000	846,656
C0069309	IT - PI & Designer XI Licenses	2024/10	2025/12	281,569	513,362	-	794,931
C0067703	IT - Prov Community Solar	2024/05	2026/07	237,758	243,790	131,000	612,548
C0061345	IT - Windows 11 Version Upgrade	2024/01	2026/07	62,371	400,000	132,000	594,371
C0047296	IT - Microsoft SQL Consolidation	2024/01	2026/07	323,446	76,074	120,000	519,520
C0011159	IT - Plant Information System Upgrade	2024/01	2026/07	82,533	149,058	75,000	306,592
C0061295	IT - Switch Replacement Management	2024/01	2026/07	4,572	171,025	52,500	228,097
C0047299	IT - Replacement of Cisco Endpoint	2024/01	2026/07	37,988	134,775	51,000	223,763
	Total Computers			**$12,562,381**	**$8,982,086**	**$1,416,185**	**$22,960,652**
47751	ECC Dynamic Line Rating Implementation	2015/11	2027/03	133,979	716,102	118,141	968,222
C0061525	ECC Facility Ratings	2024/02	2025/04	794,667	169,649	-	964,316
C0032664	Energy Control Centre - Optimization Tools	2021/06	2026/01	3,433,051	(2,537,936)	-	895,115
C0032143	GIS Underground Asset Modelling	2021/03	2025/06	78,583	433,399	-	511,982
C0062524	Damage Assessment Enhancements 5.0	2024/03	2025/10	79,790	307,139	-	386,929
C0065685	AMO Enhanced Substation Analytics	2024/03	2025/09	121,689	99,650	-	221,339
C0067899	AMO Wildfire Risk Mapping	2024/08	2025/09	92,081	102,595	-	194,676

Figure 33: General Plant - Carry-Over Spending Summary

CI#	Project Title	Start Date	Final Date	Previous Expenditure ($)	2025 Budget ($)	Subsequent Spending ($)	Total Estimate ($)
C0064663	AMO Rounds Pro Upgrade	2024/02	2026/05	30,966	86,150	-	117,116
C0068105	AMO - Hydro EMS Automation	2024/08	2025/12	26,511	69,388	-	95,899
	Total Other General Plant			**$4,791,316**	**($553,863)**	**$118,141**	**4,355,594**
	Total General Plant Carry-Over Spending			**$30,303,062**	**$9,461,130**	**$1,638,761**	**$41,402,954**

9.2 General Plant – New 2025 Capital Items for ACE Plan Approval

Figure 34: General Plant - New 2025 Capital Items for ACE Plan Approval

Tab #	CI#	Project Title	2025 Budget	Project Total
	General Plant			
GP01	C0051815	RTU Replacements Program Phase 6	1,893,167	5,959,915
GP02	C0070907	MDR-8000 Microwave Radio Replacement	511,996	1,572,478
GP03	C0069270	2025 SCADA/EMS Upgrade	749,671	1,306,288
	Total General Plant New Spending		**$3,154,835**	**$8,838,681**

10.0 ROUTINE CAPITAL PROGRAM

NS Power's routine capital program is for recurring annual expenditures of like-for-like replacement of equipment, additions to existing equipment base resulting from system growth, and addition of customers to the system. This section details all routine capital expenditures for generation, transmission, distribution and general plant asset classes. NS Power seeks NSUARB approval of the 2025 routine capital program in the amount of approximately $194.6 million.

10.1 Routine Capital Spending by Function Yr/Yr

Figure 35: Routine Capital Spending by Function Yr/Yr

	2023 Actual	2024 Budget	2024 Forecast*	2025 ACE Plan
Generation				
Generation Equipment Replacements	$5,935,099	$4,707,993	$3,461,296	$5,317,515
Generation Other Hydro	1,285,525	1,081,430	1,236,106	1,352,219
Generation Other Thermal	283,184	537,028	534,721	475,944
	$7,503,808	$6,326,451	$5,232,123	$7,145,678
Transmission				
Transmission Substation Replacement, Add'ns/Mod'ns	$4,389,938	$4,090,679	$4,993,197	$4,375,511
Primary Equipment Spares	203,758	300,000	197,699	300,000
Protection Modification & Replacement	778,712	966,527	1,057,918	987,791
Transmission Line Replacement, Add'ns/Mod'ns	9,546,928	9,236,865	8,767,696	9,329,311
Transmission Right-of-Way Widening	699,362	576,360	850,905	2,999,500
	$15,618,698	$15,170,431	$15,867,416	$17,992,113
Distribution				
Meters	$2,631,823	$4,720,912	$4,332,157	$4,876,834
Distribution Upgrades and Replacement	46,331,171	38,617,951	42,366,738	44,744,622
New Customers	54,080,024	43,095,218	68,790,124	69,444,057
Joint Use	9,036,334	5,941,032	4,376,272	4,581,202
Distribution Right-of-Way Widening	880,758	9,909,703	9,748,963	12,502,942
	$112,960,111	$102,284,817	$129,614,253	$136,149,656

Figure 35: Routine Capital Spending by Function Yr/Yr

	2023 Actual	2024 Budget	2024 Forecast*	2025 ACE Plan
General Plant				
Work Vehicles	$8,916,240	$15,780,782	$9,228,355	$19,199,029
Tools and Test Equipment	2,224,651	2,521,586	2,606,810	1,921,927
Telecommunications	1,233,975	1,299,423	1,447,948	1,387,013
Computing Asset Management	1,806,101	3,603,212	3,616,319	4,471,479
Property Improvements and Furniture	1,923,397	3,515,004	3,084,811	4,882,004
Other	1,085,877	1,357,014	1,347,583	1,450,720
	$17,190,240	$28,077,021	$21,331,827	$33,312,172
Total Routine Capital Spending	**$153,272,858**	**$151,858,720**	**$172,045,618**	**$194,599,619**

*The Forecast includes actuals up to July and forecast amounts for the remainder of the year.
Note: The entire routine program totals $195.1 million including Point Aconi routines. The totals presented above and in the following information do not include Point Aconi routines.

10.2 Routine Capital Spending Project Breakdown Yr/Yr

Figure 36: Routine Capital Spending Project Breakdown Yr/Yr

Project #	CI #	Project Title	2023 Actual	2024 Budget	2024 Forecast*	2025 ACE Plan
G001	10634	CT - Routine Equipment Replacements	442,116	299,296	294,849	305,936
H001	11622	HYD - Routine Equipment Replacement	917,481	923,834	632,198	951,549
H004	27867	HYD - Roofing Routine	122,692	127,105	124,124	132,189
	10645	POT - Routine Equipment Replacement	216,781	228,250	237,803	227,451
	10673	TRE - Routine Equipment Replacement	367,697	391,516	352,329	385,427
	43646	PHB - Routine Equipment Replacement	66,742	226,437	243,732	232,603
	10621	TUC - Routine Equipment Replacement	1,889,512	347,549	(565,197)	378,649
	10626	LIN - Routine Equipment Replacement	365,008	398,283	393,157	397,910
S004	27856	TRE - Roofing Routine	48,996	88,653	92,338	269,732
	27855	POT - Roofing Routine	196,010	176,423	89,248	134,857
	27854	TUC - Roofing Routine	(12,145)	52,820	41,706	50,571
	C0068934	PHB - Roofing Routine	-	-	-	125,774
	27857	LIN - Roofing Routine	37,495	177,214	135,593	176,095
W001	41830	Wind - Routine Equipment Replacement	1,276,715	1,270,612	1,389,417	1,548,773
	Generation Equipment Replacements Total		**$5,935,099**	**$4,707,993**	**$3,461,296**	**$5,317,515**

Figure 36: Routine Capital Spending Project Breakdown Yr/Yr

Project #	CI #	Project Title	2023 Actual	2024 Budget	2024 Forecast*	2025 ACE Plan
H005	35583	HYD - Oil Release Risk Assessment	349,746	214,387	599,570	459,164
H006	35584	HYD - Gate Refurbishment	283,553	202,358	226,203	208,428
	C0053718	HYD - Dam Safety Routine	652,226	664,686	410,333	684,627
	Generation Hydro Total		**1,285,525**	**1,081,430**	**1,236,106**	**1,352,219**
S005	C0068935	PHB - Heat Rate Routine	-	-	-	125,023
	33871	TUC - Heat Rate Routine	65,152	86,774	79,045	87,482
	33867	POT - Heat Rate Routine	62,199	108,199	116,457	107,264
	33869	TRE - Heat Rate Routine	92,366	83,086	130,777	79,311
	33863	LIN - Heat Rate Routine	63,467	258,969	208,441	76,863
	Generation Thermal Total		**$283,184**	**$537,028**	**$534,721**	**$475,944**
T003	23120	Provincial - Trans Substation Primary	3,439,246	3,247,486	3,806,895	3,450,150
T004	23121	Provincial - Substation Additions & Replacements	950,692	843,193	1,186,302	925,361
	Transmission Subs Replace, Adds/Mods Total		**$4,389,938**	**$4,090,679**	**$4,993,197**	**$4,375,511**
T018	14973	Primary Equipment Spares	203,758	300,000	197,699	300,000
	Primary Equipment Spares Total		**$203,758**	**$300,000**	**$197,699**	**$300,000**
T016	14841	Protection Modification & Replacement	778,712	966,527	1,057,918	987,791
	Protection Modification & Replacement Total		**$778,712**	**$966,527**	**$1,057,918**	**$987,791**
T001	23115	Provincial Transmission Line Replace	3,869,934	3,300,338	2,803,614	3,274,053
T011	23118	Provincial Planned Trans Line Replacement	5,676,994	5,936,527	5,964,083	6,055,258
	Transmission Line Replacements Total		**$9,546,928**	**$9,236,865**	**$8,767,696**	**$9,329,311**
T010	43827	Transmission Right of Way Widening	699,362	576,360	850,905	2,999,500
	Transmission Right-of-Way Widening Total		**$699,362**	**$576,360**	**$850,905**	**$2,999,500**
D009	26496	Meter Routine	2,631,823	4,720,912	4,332,157	4,876,834
	Meters Total		**$2,631,823**	**$4,720,912**	**$4,332,157**	**$4,876,834**

Figure 36: Routine Capital Spending Project Breakdown Yr/Yr

Project #	CI #	Project Title	2023 Actual	2024 Budget	2024 Forecast*	2025 ACE Plan
D005	23158	Unplanned Replace Deteriorated	24,214,193	19,444,842	24,784,738	21,246,256
D006	23135	Regulatory Replacements - Province	3,078,062	2,351,404	2,649,998	4,124,211
D008	23361	Provincial Storm	8,549,877	7,698,207	5,365,151	8,023,575
D051	29038	System Performance Improvement Routine	691,625	333,023	550,909	729,719
D055	23137	Planned Replacement Of Distribution	9,797,413	8,790,476	9,015,941	10,620,862
	Distribution Upgrades and Replacement Total		**$46,331,171**	**$38,617,951**	**$42,366,738**	**$44,744,622**
D004	26716	New Customer Upgrades	12,535,186	8,563,623	17,176,783	17,342,537
D018	23511	Primary Equipment Spares - Distribution	28,987	153,000	162,662	160,000
D061	39766	New Customers - Residential	33,133,106	26,934,397	39,105,670	39,490,277
D062	39770	New Customers - Commercial	8,382,745	7,444,198	12,345,009	12,451,243
	New Customers Total		**$54,080,024**	**$43,095,218**	**$68,790,124**	**$69,444,057**
D007	23136	Contractual Replacements (Joint Use)	9,036,334	5,941,032	4,376,272	4,581,202
	Joint Use Total		**$9,036,334**	**$5,941,032**	**$4,376,272**	**$4,581,202**
D010	23127	Provincial Widening	880,758	9,909,703	9,748,963	12,502,942
	Right of Way Widening Total		**$880,758**	**$9,909,703**	**$9,748,963**	**$12,502,942**
P006	20945	Replacement and Additional Work Vehicles	166,493	300,000	277,672	1,098,000
P063	39304	Class 3 Work Vehicle Replacements	-	300,000	303,831	300,000
P062	39305	Work Vehicle Replacements	6,673,940	9,781,782	3,029,209	11,590,824
P061	40236	Transportation Vehicle Replacements	2,075,807	5,399,000	5,617,643	6,210,205
	Work Vehicles Total		**8,916,240**	**$15,780,782**	**$9,228,355**	**$19,199,029**
P002/P016		Meter Shop - Tools and Equipment	2,102,008	2,400,141	2,490,593	1,794,409
P015	11611	Hydro Production Tools, Test Equipment	122,643	121,445	116,217	127,517
	Tools and Test Equipment Total		**2,224,651**	**$2,521,586**	**$2,606,810**	**$1,921,927**
P025	16365	Mobile Radio Routine	181,247	238,819	218,261	238,819
P027	16551	Telecommunication Radio and Fibre Optics	165,101	201,971	201,674	222,168
P028	16550	Telecommunication Systems Replace & Modifications	699,069	673,933	843,223	741,326
P814	38243	Telecommunications Spares	188,558	184,700	184,789	184,700
	Telecommunications Total		**1,233,975**	**$1,299,423**	**$1,447,948**	**$1,387,013**

Figure 36: Routine Capital Spending Project Breakdown Yr/Yr

Project #	CI #	Project Title	2023 Actual	2024 Budget	2024 Forecast*	2025 ACE Plan
P010	16073	SCADA Improvements Routine	49,604	94,250	51,664	50,596
P031	29114	NS Power IT Infrastructure	1,614,836	1,700,000	1,678,013	2,568,500
	C0061443	IT - WAM Capital Enhancement Routine	-	1,625,040	1,660,160	1,677,413
P040	28522	CT's DCMS Routine	27,263	20,922	20,838	20,229
	25667	POT - DCMS Equipment Replacement Routine	3,437	35,000	67,383	35,000
	25626	TRE - DCMS Equipment Replacement Routine	11,122	32,000	39,737	28,750
	25646	TUC - DCMS Equipment Replacement Routine	76,258	61,000	61,000	56,000
	25668	LIN - DCMS Equipment Replacement Routine	23,581	35,000	37,524	34,992
	Computing Asset Management Total		**$1,806,101**	**$3,603,212**	**$3,616,319**	**$4,471,479**
P001/P030		Property Improvement and Furniture	1,923,397	3,515,004	3,084,811	4,882,004
	Property Improvement and Furniture Total		**$1,923,397**	**$3,515,004**	**$3,084,811**	**$4,882,004**
P012/P041		Other (HYD - Security Improvement & FAC - Land Acquisition)	334,273	584,680	547,560	600,720
P018	48158	Environment Equipment Replacement Routine	149,914	100,000	64,885	100,000
P816	38897	FAC Enviro Property Remed Routine	179,385	325,000	325,000	325,000
P815	38896	FAC Environment Site Assess Routine	247,030	325,000	325,000	325,000
P032	38848	Purchasing Equip & Warehouse Routine	175,275	22,334	85,139	100,000
	Other Total		**1,085,877**	**$1,357,014**	**$1,347,583**	**$1,450,720**
	Routine Capital Spending		**$153,272,858**	**$151,858,720**	**$172,045,618**	**$194,599,619**

Note: Point Aconi amounts have been removed to represent the spend amount that requires NSUARB approval.
*The 2024 Forecast includes actuals up to July and forecast amounts for the remainder of the year.

10.3 Like-for-Like Routine Replacements

The NSUARB's 2013 ACE Plan Order Directive 2 provided as follows:

> The Board directs NSPI, in the next ACE Plan application, to analyze the routine expenditures to determine what are the "like-for-like" totals. NSPI is further

directed to explain why those totals, if they are similar in magnitude to the Board's analysis, are growing at an annual rate in excess of inflation.[17]

A summary of NS Power's total routine and like-for-like routine spending is provided in **Figure 37** below.

Figure 37: Annual Cost of Like-for-Like Routine Replacements

NOVA SCOTIA POWER ($M)	2021 Actuals	2022 Actuals	2023 Actuals	2024 Forecast	2025 ACE
Total Routine Spending	$116.6	$230.0	$153.3	$172.0	$194.6
Less:					
New Customers	36.5	40.8	54.1	68.8	69.4
System Growth and Performance	2.4	1.9	3.4	12.8	17.5
Other	1.5	1.7	1.3	1.9	1.8
Like-for-Like	$76.3	$185.6	$94.5	$88.6	$105.8
Work Vehicles (Like-for-like)	10.8	10.2	8.9	9.2	19.2
Net (Like-for-like)	$65.5	$175.4	$85.6	$79.4	$86.6

Routine classifications are determined by the primary classification of each routine project. If the majority of the work completed under the routine is like-for-like replacements, the routine is classified as like-for-like. New Customer routines, System Growth and Performance routines (such as heat rate, system improvement, and right-of-way widening routines), and other routines (such as environmental assessment routines) are not included in the like-for-like totals.

[17] NSUARB-P-128.13, 2013 Annual Capital Expenditure Plan, NSUARB Order, June 4, 2013.

10.4 2025 Routine Capital Spending Project Details

Transmission

Figure 38: Transmission Substation Replacements, Additions and Modifications	2025 ACE Plan Forecast
T003 Provincial: Transmission Substation Primary Equipment	
Unplanned Replacements	$2,575,150
Lightning Arrestor Replacements	200,000
Transformer Regaskets	200,000
Breaker Regaskets	75,000
Insulating Fluids Replacements	200,000
Battery Bank Replacements	200,000
Total T003 Provincial: Transmission Substation Primary Equipment	**$3,450,150**
T004 Provincial: Substation Additions & Replacements	
Unknown Additions	175,361
Oil Containment Additions	750,000
Total T004 Provincial: Substation Additions & Replacements	**$925,361**
Total Transmission Substation Replacements, Additions and Modifications	**$4,375,511**

Figure 39: Primary Equipment Spares

T018 Primary Equipment Spares	2025 ACE Plan Forecast
Online DGA Monitors	$120,000
Tap Changer Components	120,000
Transformer Auxiliary Devices	60,000
Total Primary Equipment Spares	**$300,000**

Figure 40: Protection Modification and Replacement

T016 Protection Modification & Replacement	2025 ACE Plan Forecast
This routine is budgeted based on historical T016 investment.	**$987,791**

Figure 41: Transmission Line Replacement, Additions, Modifications

		2025 ACE Plan Forecast
T001 Provincial Transmission Line Replacement (Unplanned)		
This routine is budgeted based on historical T001 investment		**$3,274,053**
T011 Provincial- Planned Transmission Line Replacement		
LINE #	**Description**	
L5019	Canaan Rd. 43V to Hollow Bridge Hydro 6V	482,000
L5020	Hollow Bridge Hydro 6V to Methals Hydro 7V	455,000
L5021	Canaan Rd. 43V to Klondike 50V	402,000
L5026	Gulch Hydro 13V to Paradise Hydro 11V	598,000
L5530A	Milton 50W to Souriquois 30W	470,000
L6003	Sackville 90H to Tufts Cove 91H	120,000
L6009	Sackville 90H to Burnside 108H	105,000
L6517	Port Hastings 2C to Point Tupper 1C	286,000
L6518	Port Hastings 2C to STORA 47C	257,000
L6533	Victoria Jct. 2S to Lingan 88S	197,000
L6538	Glen Tosh 5S to Gannon Rd. 3S	252,000
L7014	Lingan 88S to Woodbine 101S	654,000
Various	1-6 Month Inspection Driven Work	1,777,258
T011 Provincial- Planned Transmission Line Replacement		**$6,055,258**
	Transmission Line Replacement Total	**$9,329,311**

1

T010 – Provincial: Transmission Right of Way Widening

In its 2017 ACE Plan Order, the Board directed NS Power as follows:

> The Board directs NSPI to update the cost estimates for vegetation management and right-of-way widening projects in the 2018 ACE Plan (and future years) based on actual historical costs incurred for this project.[18]

NS Power confirms that the cost estimates for vegetation management and right-of-way widening projects in the 2025 ACE Plan are based on actual historical costs incurred. This forecast is also developed based on the known level of widening in the current year as set out in **Figure 42** below:

Figure 42: T010 Forecast by Line

> 69 kV	
L-6511	$500,000
L-7003	725,000
L-7004	600,000
L-7005	450,000
L-7008	374,500
L-7009	350,000
Total T010	$2,999,500

The Board's 2016 ACE Plan Order provided the following directive:

> The Board directs that the Routine for Transmission widening be treated as a separate project, and not a routine, in future ACE Plan Applications. NSPI is to provide an annual progress report on the expenditure, works undertaken, results achieved and future plans as part of the annual ACE Plan submissions.[19]

[18] M07745, NS Power 2017 Annual Capital Expenditure Plan, NSUARB Order, April 4, 2017.
[19] M07176, NS Power 2016 Annual Capital Expenditure Plan, NSUARB Order, June 8, 2016, page 2. NS Power's annual progress report on the expenditure, works undertaken, results achieved and future plans can be found in the 2025 ACE Plan Reliability Directive in **Section 11.1.5**.

CI C0052055 - 2023/2024 Transmission Right-of-Way Widening 69 kV was approved by the Board on March 6, 2023. This was the last phase of the 69 kV widening program, which will be completed in 2024. The addition of a separate capital work order for transmission Right-of-Way widening since 2016 has led to the transmission vegetation management program being carried-out under three broad initiatives:

1. Operating activities for transmission vegetation management;
2. Capital routine T010 - Transmission Right-of-Way Widening (for 138 kV, 230 kV and 345 kV ROWs); and
3. New transmission rights-of-way widening individual capital projects (i.e. CI C0052055 for 69 kV ROWs and prior phases).

With the conclusion of the 69 kV Widening program, the transmission vegetation management program will only include items 1 and 2 listed above going forward. NS Power continuously assesses the potential of increasing the width of certain rights-of-way on its 138 kV system in areas where additional width is warranted. This is reflected in the increased T010 Transmission ROW Widening routine which has increased from a historical budget of $600,000 to the $3 million investment included in the 2025 Routine Capital Program. This work will continue to improve the transmission system's ability to withstand significant weather events where tree fall ins from the edge of the ROW can pose a risk to NS Power's infrastructure. Widening these ROWs mitigates the risk of these tree fall ins for the vast majority of trees on the edge of the ROW.

The increased investment in T010 for the widening of 138 kV, 230 kV, and 345 kV rights-of-way remains consistent with the 2016 directive. While the 69 kV widening program is substantially complete, there were areas where permission or easements from landowners could not be acquired. In the event that permission or an easement is received, this work is still valuable to be completed and therefore could be included in T010 in the future, as opposed to keeping the last phase of the 69kV program open for an indeterminate amount of time.

Distribution

In its Decision relating to the 2021 Distribution Routines ATO, the Board directed NS Power to include information in the 2024 ACE Plan as follows:

> 7. To report in the 2024 ACE Plan on the findings and actions taken as a result of the review of each individual routine. NS Power should consider these routines respective increase drivers when budgeting for their costs.

Although this directive was specific to the 2024 ACE Plan, NS Power believes that this information remains helpful. Please refer to **Figure 43** below for a summary of the forecasting methodology used in each Distribution Routine.

Figure 43: Summary of Forecasting Methodology for Distribution Routines

Distribution Routines	Forecasting Methodology
D004 New Customer Upgrades	2024 Q3 Forecast Plus Inflation
D005 Unplanned Replacement Deteriorated Equipment	5 Year Average Plus Inflation
D006 Regulatory Replacements - Province	Estimates based on past experience and project estimates
D007 Joint Use	3 Year Average Plus Inflation (excluding 2023 actuals)
D008 Provincial Storm	5 Year Average Plus Inflation (excluding Extreme Events)
D051 System Performance Improvement Routine	Based on project estimates
D055 Planned Replacement Deteriorated Equipment	Partially based on 2024 Q3F Plus Inflation for Bin work, streetlight/service installation and removal and Field Driven Work and individual project estimates
D061 New Customers - Residential	2024 Q3 Forecast Plus Inflation
D062 New Customers - Commercial	2024 Q3 Forecast Plus Inflation

Figure 44: Meters - D009 Meter Routine

Item#	Prg#	Meter Type	Meter Style	Description	2025 Forecast	Current Unit Cost ($)	Capital for meters ($)
1.0 Element, 120-240 volt							
	103	Form 3S (5 Jaw)	3450560	CP3SRA (HW4.1) 3S CL20 OPENWAY RIVA CENTRON POLYPHASE METER. 120V-277V. BID	672	166.18	111,673
	104	Form 3S (5 Jaw)	3450564	CP3SRA (HW4.1) 3S CL20 OPENWAY RIVA CENTRON POLYPHASE METER. 120V-277V. (TOU)BID	192	166.18	31,907
1.5 Element, 120-240 volt							
	101	C2SRD	3450510	C2SRD (HW 4.1) 2S CL200 OPENWAY RIVA CENTRON W/ DISCONNECT.	2160	118.00	254,880
	102	C2SRD TOU/BID	3450512	C2SRD (HW 4.1) 2S CL200 OPENWAY RIVA CENTRON W/ DISCONNECT (TOU)BID	6840	118.00	807,120
	102	C2SR	3450569	C2SR (HW4.1) 2S CL200 OPENWAY RIVA CENTRON "NO DISCONNECT"	120	118.00	14,160
	0	C2SR 320	3450570	C2SR (HW 4.1) 2S CL320 OPENWAY RIVA CENTRON no DISCONNECT.	360	225.04	81,014
	0	0	adder	Cellular Adder single phase	50	136.75	6,838
2.0 Element, 120-480 volt							
	101		3450511	CN2SRD (HW 4.1) 12S CL200 OPENWAY RIVA CENTRON W/ DISCONNECT	6960	132.00	918,720
	102		3450513	CN2SRD (HW 4.1) 12S CL200 OPENWAY RIVA CENTRON W/ DISCONNECT (TOU)	120	132.00	15,840
	0		3450559	CP3SRA (HW4.1), 12S CL200 OPENWAY RIVA CENTRON POLYPHASE METER. 120V-277V	96	204.97	19,677
	103		3450565	CP3SRA (HW4.1) 45S CL20 OPENWAY RIVA CENTRON POLYPHASE METER. 120V-277V	192	204.97	39,354
3.0 Element, 120-347 volt							
	103	9s	3450561	CP3SRA (HW4.1) 9S/36S CL20 OPENWAY RIVA CENTRON POLYPHASE METER. 120V-277V	576	198.00	114,048
	103	16s	3450562	CP3SRA (HW4.1) 16S CL200 OPENWAY RIVA CENTRON POLYPHASE METER. 120V-277V	576	198.00	114,048
	103	16s	3450563	CP3SRA (HW4.1) 16S CL200 OPENWAY RIVA CENTRON POLYPHASE METER. 240V-480V	672	198.00	133,056
	0	0	adder	Cellular adder, 3 phase	20	421.39	8,428

Figure 44: Meters - D009 Meter Routine

Item#	Prg#	Meter Type	Meter Style	Description	2025 Forecast	Current Unit Cost ($)	Capital for meters ($)
				Total Meters	**19,606**		**2,670,763**
				Misc Meters "ION"	6	9,500	57,000
				Cellular Meters	12	1,000	12,000
				CT and PT requirements			450,000
				Wire, Adapters and switches			195,000
				CGR Batteries			100,000
				Total Materials			**3,484,763**
				Freight			**127,439**
				Applied Overhead			**652,261**
				Labour			**612,371**
				D009 Meters Total			**4,876,834**

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Distribution Upgrades and Replacement

Figure 45: Distribution Upgrades and Replacement	2025 ACE Plan Forecast
D005 Unplanned Replacement Deteriorated Equipment	
This forecast is developed based on a five-year historical average of prior spending levels with an annual inflation of 2.2%, resulting in an estimated 8,655 persondays of work at a unit cost of $2,455/persondays.	**$21,246,256**
D006 Regulatory Replacements	
This forecast is developed based on past experience and information from various government agencies. This amount could vary based on current year decisions by these agencies.	**$4,124,211**
D008 Provincial Storm	
This forecast is developed based on a five-year historical average of prior spending levels with Extreme Event Day storms removed and an annual inflation of 2.2%. There can be significant variation in this amount based on yearly storm activity.	**$8,023,575**
D051 System Performance Improvement	
16N-301 2878 Hwy 2 Shubenacadie River	148,003
113H-433G West Lawrencetown Stepdown	173,982
6W-201 - Offload to 50W	82,734
15S-301-Targeted Replacement	45,000
62N-413 Protection Study	60,000
2025 Protection Study Upgrades	150,000
2H-423-Off-Peninsula 2H Feeder Reconfiguration	70,000
Total D051 System Performance Improvement	**$729,719**
D055 Planned Replacement of Distribution Equipment	
Bin Work (Work resulting from NS Power's distribution line inspection program that has been identified as requiring follow up within one year.)	1,839,350
Streetlight/service installation & removal (This funding is to support system upgrades required for streetlight installations and upgrades. This includes transformer installs, service upgrades and/or new pole installations.)	1,720,778
Field Driven Work	3,700,926
568C-311-Egypt road rebuild	150,000
11S-301 -Campbell Road Water Crossing	342,000
113H-441G Colby Drive Rebuild	115,684
126H-312G-Murphy Rd Rebuild	87,503
20H-303 Essex Dr Framing Replace	12,822
82V-403 Carroll's Corner Bridge	76,728
82V-403 Highway 277 Pole Replace	66,013

Distribution Upgrades and Replacement

Figure 45: Distribution Upgrades and Replacement	2025 ACE Plan Forecast
48H-301-Sinclair St Pole Replacements	50,539
20N-203-Church St-Rebuild	188,063
581C-311 - Ballantynes Cove BTR	125,329
584N-301 Irwin Lake Rd Upgrades	137,025
665H-311 Malay Falls Rd Rebuild	55,428
33N-201 Canaan Rd Conversion	428,808
585C-311 Antigonish Harbor Rebuild	224,961
26N-211 Joggins Stepdown Retirement	240,434
513N-301 Caribou Overloaded Stepdown	108,146
2024 Manhole Cover Replacement	5,000
2024 Padmount Switch Replacement	10,000
2023 Manhole Equipment Replacement	127,855
2024 Switching Cubicle Replacement	185,970
2025 Manhole Covers Replacement	194,023
92W-302 Valley Crescent Rebuild	189,497
16W-301H Pembroke Rd Rebuild	237,980
Total D055 Planned Replacement of Distribution Equipment	**$10,620,862**
Distribution Upgrades and Replacement Total	**$44,744,623**

D005 Forecasting Approach

In its Decision relating to the 2019 Distribution Routines ATO, the Board directed NS Power as follows:

1. NS Power is to provide further breakdown of forecasting and overtime within future ACE/ATO filings in order to improve the transparency of reporting provided for the D005 Routine.

2. NS Power is to improve transparency in future ACE/ATO filings by including further information on how the historical large storm events have been incorporated into this Routine, and how they affect the ongoing forecast.[20]

[20] M09656, NS Power 2019 Distribution Routines ATO, NSUARB Decision, October 21, 2020.

In its Decision relating to the 2020 Distribution Routines ATO, regarding the D005 Routine, the Board directed NS Power to "provide further details on failed and damaged devices in future ACE Plan and ATO filings, including current and historical operational and financial data"[21].

The forecast for D005 for 2025 was developed based on the previous 5-year average for spending from 2020-2024 plus an annual inflation of 2.20 percent. This forecast resulted in an estimated 8,655 person days of work at a unit cost of $2,455/person day. The unplanned asset failures included in this routine can occur at any time of day, including outside of normal business hours. Failures necessitating a reactive response at such times results in crews responding to replace the failed asset and restore service on an overtime basis as needed. Accordingly, the contribution from overtime labour is specifically included in the development of D005 forecasts. Historical details on failed equipment are provided in **Section 11.1.5**, **Figure 75**. While this information is not broken down by sub-routine (and therefore does not provide specific details for D005), it provides a directional view of the most impactful equipment failures the Company is experiencing. Further detail will be provided as part of future ATO filings, as required. The following breakdown of annual regular labour and overtime labour spend are both inputs into the 5-year average forecast.

Figure 46: 2020-2024 Spend in D005

Year	Regular Labour (PH)	Regular Labour $/PH	Overtime Labour (PH)	Overtime Labour $/PH
2020	48,077	$ 48.42	25,789	$ 96.83
2021	47,611	$ 49.38	28,394	$ 98.77
2022	38,170	$ 49.19	27,966	$ 98.38
2023	48,741	$ 52.04	28,066	$ 104.08
2024*	45,309	$ 54.16	30,819	$ 108.32

PH = Personhours
*This value includes Actuals to the end of July 2024 and forecast for the remainder of the year.

[21] M10182, NS Power 2020 Distribution Routines ATO, NSUARB Decision, December 13, 2021.

Using the 5-year average and an annual inflation factor of 2.20 percent results in a forecast 2025 spend in D005 of the following:

Figure 47: Forecast 2025 Spend in D005

Year	Regular Labour (PH)	Regular Labour $/PH	Overtime Labour (PH)	Overtime Labour $/PH
2025	42,570	$ 56.32	26,670	$ 112.64

This forecasting approach inherently includes an accounting for the impacts of previous years' events, such as an increase of extreme event days, through the influence on the overall D005 spending in each previous reference year detailed above. This ultimately results in budgeted amounts for D005 that reflect the overall trend of impacts from the individual reference years from 2020-2024. The resulting forecast D005 spend is dynamically adjusted as the number of impacts increase (or decrease) in the previous reference years. This supports an evolving response to cumulative effects as the associated trends emerge. The nature of individual replacements undertaken in a reactive manner under D005 does not support clear attribution specifically to the cumulative effects from previous years but result in work in the current year as opposed to in-year effects. However, NS Power believes that the 5-year budgeting methodology presented above is a reasonable approach to account for the overall effects on D005 from storm activity in prior years.

New Customers

Figure 48: New Customers	2025 ACE Plan Forecast
D004 New Customer Upgrades This forecast is developed based on forecasted spending levels in 2024 for New Customer Upgrades with an annual inflation of 2.2%.	**$17,342,537**
D018 Primary Equipment Spares Distribution This forecast is developed based on the probable amount of distribution spare equipment required during the year.	**$160,000**
D061 New Customers - Residential This forecast is for the costs associated with new residential customers net of capital contributions. Costs include metered services, unmetered services, line extensions and underground services. This forecast is developed based on forecasted spending levels in 2024 with an annual inflation of 2.2%.	**$39,490,277**
D062 New Customers - Commercial This forecast is for the costs associated with new commercial customers net of capital contributions. Costs include metered services, unmetered services, line extensions and underground services. This forecast is developed based on forecasted spending levels in 2024 with an annual inflation of 2.2%.	**$12,451,243**
Total New Customers	**$69,444,057**

New Customer Routines

In its Decision relating to the 2023 Distribution Routines ATO (D004, D061, D062), the Board directed NS Power as follows:

> In response to Board staff IRs, NS Power noted that the factors leading to cost growth for Routine D062 is interrelated with Routines D004 and D061. NS Power stated that population growth and economic growth in Nova Scotia were the primary causes of these Routines exceeding their budgets. Based on recent increased growth, the Company noted that an alternative methodology will be reviewed for forecasting the routine budgets, which will incorporate new housing start trends, population growth forecasts and electrification growth forecasts. In the 2025 ACE Plan application, the Board directs NS Power to provide details on changes to the D004, D061 and D062 Routine budget estimation methods that were assessed and provide explanations as to why they were, or were not, applied.
>
> The Board notes that an increase in the costs for Materials played a reoccurring role in the overspending for each of these Routines. It is expected that an increase in customer upgrades and service connections will result in an increase in materials,

> but it appears that the cost of the materials is also a factor that was not sufficiently budgeted. Although expenses for materials as a proportion of total budget spending increased between 3% and 7%, materials represented a significant proportion of the variance in expenditures. The Board directs NS Power to examine changes in costs for materials in addition to housing starts, population growth and electrification when examining alternate budget forecasting methodologies for these routines.[22]

Since 2020, NS Power has seen a significant increase in the total number of new customer connections, and therefore the cost of the new customer routines, after many years of relatively consistent spend. NS Power previously adjusted the forecasting methodology for D061 from using a five-year average to a three-year average in response to increasing customer growth. However, with ongoing consistent growth in that routine since 2020, this methodology has resulted in significant under budgeting of this routine. D004 and D062 have continued to utilize five-year averages for budgeting purposes, but with recent growth in those routines as well, this has similarly resulted in consistent under budgeting in these routines.

As a result, NS Power is evaluating alternative forecasting methods. NS Power has begun analyzing potential leading indicators such as forecasted housing completions for D061, and forecasts for employment levels in major industrial sectors for D062 from the Conference Board of Canada (CBoC) and, thus far, they have not proven to be useful leading indicators of upcoming new customer connections as there is no correlation between the change in employment levels and the spend in any of the new customer routines. The CBoC forecasts are a valuable input to the load forecast which is considering a larger time horizon; however, on a year-to-year basis it has limited value in forecasting the costs associated with connecting new customers. Over the last six years, the CBoC has forecasted a decrease of between -15 percent and -28 percent each year. Therefore, NS Power will not use the CBoC forecast as an input to the new customer routine forecasts, but will monitor any significant deviations in that forecast and adjust forecasting methodologies if appropriate. Similarly, forecast EV sales and heat pump sales have not been useful leading indicators of new customer upgrade costs as the uptake rate has had no correlation with the work in this routine in recent years. Although many heat pumps and electric vehicle charger installations

[22] M11783, NS Power 2023 Distribution Routines ATO (D004, D061, D062), NSUARB Decision, August 19, 2024.

do result in electrical upgrades, not all do, which is why there is not necessarily a correlation between that activity and D004 costs.

In the absence of new leading indicators, NS Power will employ a revised forecasting methodology to better reflect rapid customer growth over the last 5 years. **Figure 49** below shows that with the exception of D004 and D062 in 2023, using the previous year's actuals rather than a three-year or five-year average would have yielded a more accurate budget for all three new customer routines (D004, D061 and D062). Therefore NS Power has utilized this methodology for its 2025 ACE Plan forecast, and will continue to monitor its effectiveness while evaluating the effectiveness of incorporating other leading indicators. The material costs will be forecasted using the same methodology which will provide a sufficient budget for materials in 2025.

Figure 49: New Customer Routines Forecast Methodology Change

Year	D004 Actuals ($)	D004 Budget ($)	1-Year Forecast ($)	Forecast Improvement ($)
2017	7,127,636	7,740,351		
2018	7,163,732	7,162,551		
2019	6,775,603	7,114,373		
2020	7,346,941	6,466,602	6,911,115	444,513
2021	7,636,889	7,267,545	7,493,880	226,335
2022	7,695,167	7,700,269	7,789,627	89,358
2023	12,535,186	8,232,273	7,849,071	(383,202)
2024 Q3F	17,176,783	9,424,783	12,785,890	3,361,107

Year	D061 Actuals ($)	D061 Budget ($)	1-Year Forecast ($)	Forecast Improvement ($)
2017	9,523,326	8,422,167		
2018	11,119,021	8,597,052		
2019	10,957,250	8,684,813		
2020	14,657,919	8,953,148	11,176,395	2,223,247
2021	20,782,377	10,591,919	14,951,077	4,359,158
2022	26,053,860	16,353,992	21,198,024	4,844,032
2023	33,133,106	22,121,750	26,574,937	4,453,187
2024 Q3F	39,105,670	26,934,397	33,795,768	6,861,371

Year	D062 Actuals ($)	D062 Budget ($)	1-Year Forecast ($)	Forecast Improvement ($)
2017	5,722,009	6,045,087		
2018	7,290,426	5,527,804		
2019	6,126,859	5,591,403		
2020	7,079,301	5,788,784	6,249,396	460,612
2021	7,878,034	6,501,387	7,220,887	719,500
2022	7,074,222	7,035,373	8,035,594	1,000,221
2023	8,382,745	7,956,975	7,215,707	(741,268)
2024 Q3F	12,345,009	7,444,198	8,550,400	1,106,202

Joint Use

Figure 50: Joint Use

D007 Joint Use	2025 ACE Plan Forecast
This forecast is developed based on prior spending levels for both Joint Use requests from Nova Scotia Power's Joint Use Partner, Bell and communication utility requests and reflects the continued activities associated with the Internet for NS Program rolled out by the Province of Nova Scotia. This forecast is developed based on a three-year historical average, excluding 2023 actual investment, of prior spending levels with an annual inflation of 2.2%.	**$4,581,202**
Distribution Total	**$136,149,656**

Distribution Right-of-Way Widening

In its 2017 ACE Plan Order, the Board directed NS Power as follows:

> The Board directs NSPI to update the cost estimates for vegetation management and right-of-way widening projects in the 2018 ACE Plan (and future years) based on actual historical costs incurred for this project.[23]

NS Power confirms that the cost estimates for vegetation management and right-of-way widening projects in the 2025 ACE Plan are based on actual historical costs incurred. This forecast is also developed based on the known level of widening in the current year. The 2025 ACE Plan forecast

[23] M07745, NS Power 2017 Annual Capital Expenditure Plan, NSUARB Order, April 4, 2017.

for D010 ROW Widening is consistent with the approach used in 2024, which included a step change in investment under this routine. This step change represents a continuation of the New Distribution ROW where areas with no discernable ROW are being cleared to create a ROW with a clearance of 20 feet on the forested side of the line. That program only focuses on areas with no ROW currently, while prior to 2024, D010 historically widened already defined ROWs from 10 feet to 15-20 feet. With the success of the New Distribution ROW program and the benefits seen from the additional clearance, NS Power is applying the goal of 20 feet of clearance to all areas of NS Power's Distribution system where that is achievable.

The spend in this routine reflects the work that will be required to widen the rights-of-way to 20 feet on the forested side of the line is noted in **Figure 51**.

Figure 51: Distribution Right-of-Way Widening

Feeder Section	Geographic Location	Length (Km)	Managed Length (Km)	Avg Cost per Km	Cost	Contract Overhead	Total Segment Cost
100C-421	Havre Boucher	10.00	10.00	35,000	350,000	50,617	400,617
113H-433	Upper Lawrencetown	15.00	15.00	35,000	525,000	75,926	600,926
11S-411	Eskasoni	15.00	15.00	35,000	525,000	75,926	600,926
16N-301	Stewiacke	10.00	10.00	35,000	350,000	50,617	400,617
16W-301	Hebron	5.00	5.00	35,000	175,000	25,309	200,309
16W-302	Lake George	5.00	5.00	35,000	175,000	25,309	200,309
25W-301	Upper Ohio	10.00	10.00	35,000	350,000	50,617	400,617
30N-412	River Herbert	10.00	10.00	35,000	350,000	50,617	400,617
37N-411	Economy	10.00	10.00	35,000	350,000	50,617	400,617
37N-412	Dilligent River, Parrsboro	5.00	5.00	35,000	175,000	25,309	200,309
3S-403	Boularderie/Pt. Aconi	5.00	5.00	35,000	175,000	25,309	200,309
46W-303	White Point	5.00	5.00	35,000	175,000	25,309	200,309
4C-430	Cape George	10.00	10.00	35,000	350,000	50,617	400,617
50N-410	French River	10.00	10.00	35,000	350,000	50,617	400,617
55V-314	Aylesford Mountain	10.00	10.00	35,000	350,000	50,617	400,617
56N-414	Scotsburn	5.00	5.00	35,000	175,000	25,309	200,309
57S-401	Little Lorraine	5.00	5.00	35,000	175,000	25,309	200,309
57S-402	Trout Brook	10.00	10.00	35,000	350,000	50,617	400,617

Figure 51: Distribution Right-of-Way Widening

Feeder Section	Geographic Location	Length (Km)	Managed Length (Km)	Avg Cost per Km	Cost	Contract Overhead	Total Segment Cost
57W-401	South Brookfield	10.00	10.00	35,000	350,000	50,617	400,617
57W-402	Caledonia	5.00	5.00	35,000	175,000	25,309	200,309
58C-403	Inverness	5.00	5.00	35,000	175,000	25,309	200,309
59C-402	Lake Uist	5.00	5.00	35,000	175,000	25,309	200,309
62N-413	Sherbrooke	12.00	12.00	35,000	420,000	60,740	480,740
70V-311	Bridgetown	10.00	10.00	35,000	350,000	50,617	400,617
70W-311	Conquerall Mills	10.00	10.00	35,000	350,000	50,617	400,617
70W-313	Highway 332	10.00	10.00	35,000	350,000	50,617	400,617
73W-411	Stanburne	10.00	10.00	35,000	350,000	50,617	400,617
76V-301	Maitland Bridge	10.00	10.00	35,000	350,000	50,617	400,617
78W-301	Mader's Cove	5.00	5.00	35,000	175,000	25,309	200,309
78W-302	Lilydale	5.00	5.00	35,000	175,000	25,309	200,309
80W-301	Feltzen South	5.00	5.00	35,000	175,000	25,309	200,309
81N-412	Wentworth	5.00	5.00	35,000	175,000	25,309	200,309
82V-401	Shubenacadie/Milford	5.00	5.00	35,000	175,000	25,309	200,309
87W-312	Fox Point (Hwy 329)	5.00	5.00	35,000	175,000	25,309	200,309
91W-411	Molega Lake	5.00	5.00	35,000	175,000	25,309	200,309
93V-312	Saunierville	5.00	5.00	35,000	175,000	25,309	200,309
93V-313	Meteghan Station/Mavillette	5.00	5.00	35,000	175,000	25,309	200,309
96H-411	Sheet Harbour	5.00	5.00	35,000	175,000	25,309	200,309
96H-412	Sheet Harbour/Liscomb	5.00	5.00	35,000	175,000	25,309	200,309
0	Satellite Imagery	0.00	0.00	0	0	0	604,617
Total Distribution Right-of-Way Widening							**$12,502,942**

Pursuant to CI 49611 - New Distribution Rights-of-Way Phase I, submitted to the NSUARB on November 1, 2016, Liberty Consulting Group's report on its review of NS Power's response to Post Tropical Storm Arthur (PTSA) included a recommendation that for distribution rights-of-way NS Power should "develop a comprehensive plan for reclaiming and/or widening the overgrown

ROW corridors".[24] In its Supplemental Decision on September 21, 2015, the Board directed NS Power as follows:

> [36] A circumstance where it will take 32 years for the distribution vegetation management program to become sustainable causes the Board significant concern.
>
> //
>
> [38] The Board is intrigued by the stakeholder discussion concerning innovative financing options and directs NSPI to pursue that issue and report back to the Board the results of those discussions.[25]

In response to the Board's concerns, and in order to further reduce the likelihood of tree contact related outages like those during the PTSA event, NS Power increased the budget for the 2016 ACE Plan. NS Power's 2016 ACE Plan provided the following:

> NS Power is seeking approval as part of the 2016 ACE Plan of $3 million for the distribution widening routine, D010, in 2016. The $3 million comes from the portion of the annual $10.4 million that is spent on managing the vegetation in distribution ROWs to a sustainable state.[26]

In its 2016 ACE Plan Decision regarding D010, the Board directed NS Power as follows:

> …the Board assumes that NSPI has increased the distribution Routine budget by an amount of $2.4 million from the operating budget over the $600,000 in the 2015 ACE Plan. This means that NSPI is reducing its operating expenses by $2.4 million in 2016, thus increasing profits, with a corresponding increase in its rate base. This action will only increase rates which the Board does not approve. Accordingly, the Board reduces the routine budget for D010 to $600,000, to be in line with the 2015 ACE Plan amount.[27]

[24] M06321, Review of Nova Scotia Power Inc.'s (NSPI) state of preparedness and response to Post-Tropical Storm Arthur, Liberty Consulting Group, Comments on Review of NS Power's Storm Response, Exhibit A-4, September 9, 2014, page 7.
[25] M06321, Review of Nova Scotia Power Inc.'s (NSPI) state of preparedness and response to Post-Tropical Storm Arthur, NSUARB Supplemental Decision, September 21, 2015, page 14. NS Power responded with its proposal to increase spend in D010 in the 2016 ACE Plan.
[26] M07176, NS Power 2016 Annual Capital Expenditure Plan, November 12, 2015, page 72.
[27] M07176, NS Power 2016 Annual Capital Expenditure Plan, NSUARB Decision, June 8, 2016, page 18.

Consistent with prior ACE Plans, for the 2025 ACE Plan, New Distribution ROW spending is not included in the budget for D010. However, as discussed above, the D010 budget has been increased, consistent with the approach used in 2024, to allow for the new standard ROW width to be applied to areas of the Distribution system that already have defined ROWs. Investment to establish new distribution rights-of-way where none have previously existed remains with the New Distribution ROW program.

General Plant

Figure 52: Work Vehicles

P006 Replacement and Additional Work Vehicles	Quantity	Avg Unit Price	2025 ACE Plan Forecast
Reel and Pole Trailers	8	29,000	232,000
UTV / RTV	20	44,500	890,000
		Salvage	(24,000)
Total P006 Replacement and Additional Work Vehicles			**$1,098,000**
P061 Transportation Vehicle Replacements	110	60,456	6,650,205
		Salvage	(440,000)
			$6,210,205
P062 Work Vehicle Replacements	22	548,856	12,074,824
		Salvage	(484,000)
			$11,590,824
P063 Class 3 Work Vehicle Replacements	3	107,000	321,000
		Salvage	(21,000)
			$300,000
	Total Work Vehicles		**$19,199,029**

Figure 53: Tools and Test Equipment	2025 ACE Plan Forecast
Meter Shop Tools and Equipment	**$150,000**
Provincial Line Tools & Equipment	
Western Territory	127,750
North Eastern Territory	127,750
Cape Breton Territory	158,410
Central Territory	127,750
T&D Asset	300,221
System Maintenance	430,000
P002 Tools and Equipment Total	**$1,421,881**
P015 Hydro Production Tools & Test Equipment	**$127,517**
P016 Thermal Production Tools & Test Equipment	
POT Tools & Equipment	54,540
TUC Tools & Equipment	94,992
TRE Tools & Equipment	69,000
LIN Tools & Equipment	75,000
CT Tools & Equipment	24,996
PHB Tools & Equipment	54,000
P016 Thermal Production Tools & Test Equipment Total	**$372,528**
Tools and Test Equipment Total	**$1,921,927**

1

Figure 54: Telecommunication	2025 ACE Plan Forecast
P025 Mobile Radio	
Replacement radio equipment hardware and upgrades	109,500
Equipment repairs, antenna replacements and repairs	49,500
Mobile radio servers repairs and upgrades	28,000
Miscellaneous support for system	51,819
	$238,819
P027 Telecommunication Radio & Fibre Ops	
HVAC & Generator Upgrades	118,800
Radio Site repairs - Miscellaneous	58,268
Add Generator Alarms and Controls	18,700
Miscellaneous Upgrades and Replacements	26,400
	$222,168
P028 Telecommunication Systems Replace & Modifications	
Miscellaneous teleprotection equipment upgrades (as required)	29,700
Upgrade miscellaneous radio links (as required)	34,100
Misc. Telecom Equipment (as required)	42,350
Nokia Equipment Repairs and Support	23,100
Telecom engineering services	59,488
Telecom engineering support services	28,710
Battery Replacements	82,495
Replace Miscellaneous Power Supplies	8,800
UPS Replacements Various Sites	8,800
Network standardization documentation	28,600
Cable & Entrance Protection - Positron	17,600
Switched Communications - System Operations Phones	6,600
Replace Fibre Optic Equipment (NEC & ADC)	37,125
Install Fibre Links for telecom sites	127,059
Network Monitoring Upgrades	60,500
Alarm Commissioning for new sites into SCADA	61,050
Review and Update System Drawings and Records	33,495
Support Services for Nokia/ALU	29,920
Tower Lighting Upgrades	21,835
	$741,326

Figure 54: Telecommunication	2025 ACE Plan Forecast
P814 Telecommunications Spares	
Alcatel-Lucent MPR9500 Microwave Radio	50,500
Net Guardian Alarm Monitoring Equipment	15,000
7705 MPLS Router Spares	25,000
Ethernet Spares	4,200
MDS SD9, Transnet, INet	10,000
SEL 2505, 2506 Spares	10,000
RFL IMUX and 9745 Spares	10,000
Battery Charger Spare	10,000
RTU and Misc. Spares	50,000
	$184,700
Telecommunications Total	**$1,387,013**

1

Figure 55: Computing Asset Management		2025 ACE Plan Forecast
P010 SCADA Improvements		
	This forecast is developed based on SCADA equipment/operator interfaces failures or modifications	
P010 SCADA Improvements Total		**$50,596**

Figure 55: Computing Asset Management

Infrastructure Component	Asset Management Plan	Volume to be Refreshed	2025 ACE Plan Forecast
P031 NS Power IT Infrastructure			
Voice and Data Network	Network Infrastructure & Equipment		100,000
Physical Security	Physical Security technology (Cameras, DVRs, Controllers)		70,000
	Physical Security Devices		382,000
	Kantech Physical Security Access Control Systems		86,500
	Servers, OS Licenses & Storage		100,000
Power Supplies	UPS units in branch offices		50,000
Laptop and Desktop Computers, Personal Devices	Computers that have or will reach four (4) years old	500	900,000
	New laptops or desktop computers	100	200,000
	Mobile Devices	250	400,000
	Accessories for end user equipment		150,000
	Software		30,000
	Application enhancements/development		100,000
P031 NS Power IT Infrastructure Total			**2,568,500**
P040 DCMS Equipment Replacement			
	CT's DCMS Equipment Replacement		20,229
	POT DCMS Equipment Replacement		35,000
	TRE DCMS Equipment Replacement		28,750
	TUC DCMS Equipment Replacement		56,000
	LIN DCMS Equipment Replacement		34,992
			$174,971
C0061443 IT - WAM Capital Enhancement Routine			**$1,677,413**
	Computing and Asset Management Total		**$4,471,479**

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Figure 56: Property Improvement and Furniture

		2025 ACE Plan Forecast
Property Improvement and Furniture		
P001	Building Envelope Work	25,000
	Roofing & Emergency Repairs	125,000
	Grading/Drainage Investigation and Repairs	96,000
	Fencing Improvements	114,000
	GC Work	477,000
	Asphalt Replacement	80,000
	Consultant Services	190,004
	HVAC, Generator & Electrical	237,000
	Substations	100,000
	Transformer Dock Improvements	70,000
	Pole Brow	100,000
	Depot Renovation	300,000
	STE Structural	200,000
	PCB Program	200,000
	Lak BMS Replacement	275,000
	Generator Project	827,000
	MCC UPS & Battery Bank Replacements	795,000
	Security Improvements	300,000
	1H General Refurbishments	371,000
	Property Improvement and Furniture Total	**$4,882,004**

Figure 57: Other

	Other	2025 ACE Plan Forecast
P012	HYD - Security Improvements	550,720
P018	Environmental Equipment Replacement	100,000
P041	FAC - Land Acquisition Routine	50,000
P816	FAC - Environment Property Remediation	325,000
P815	FAC - Environment Site Assessment	325,000
P032	FAC - Equipment & Warehouse	100,000
	Other Total	**$1,450,720**
	General Plant Total	**$33,312,172**

11.0 DIRECTIVES AND MISCELLANEOUS

11.1 NSUARB ACE Plan Directives and Stakeholder Commitments

NS Power has received a number of Directives from prior ACE Plan Decisions. The Company has also made a number of commitments to stakeholders. Responses to each of these Directives and commitments are provided below.

11.1.1 Sustaining Capital – 2025 ACE Plan Alignment with the Evergreen Integrated Resource Plan (IRP)

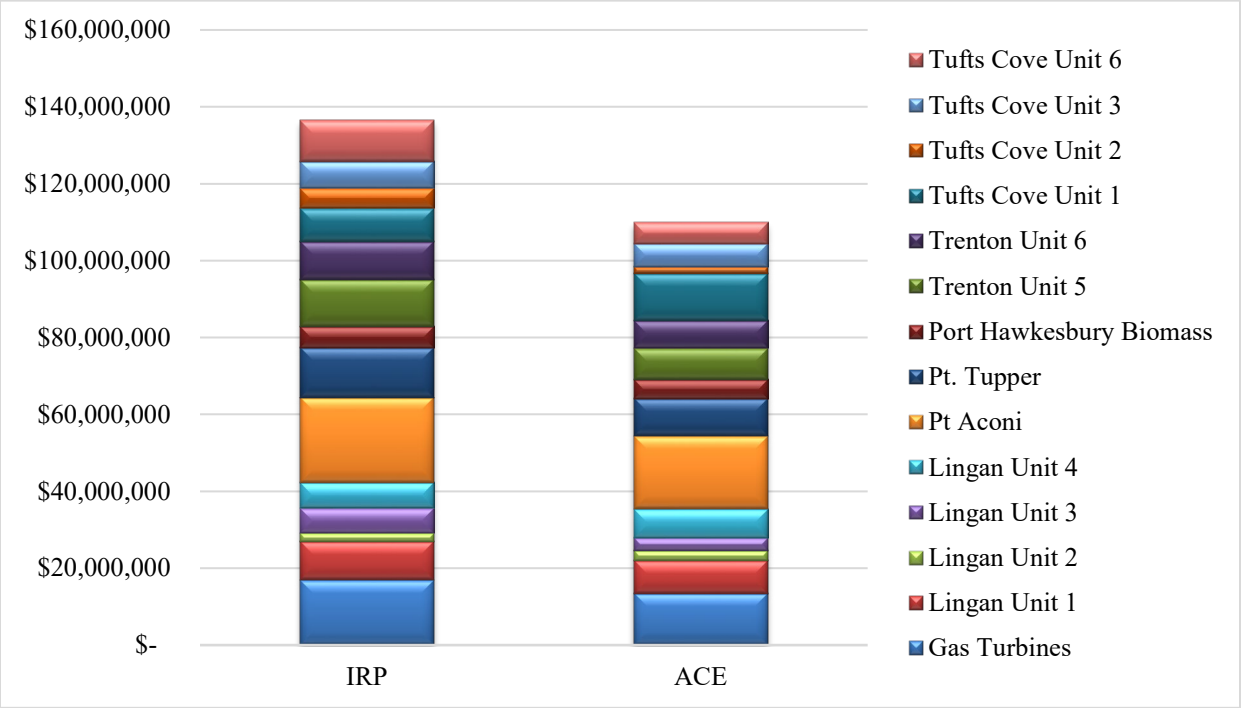
As the Nova Scotia generation mix transitions to meet the Province's decarbonization goals, a lower utilization profile is planned for the remaining emitting generation fleet. The sustaining capital investment for the emitting fleet in the 2025 ACE Plan reflects the level of investment necessary to continue to reliably operate these units into the future at utilization levels reflected in NS Power's 2023 Evergreen IRP and 2024 10-Year System Outlook.

Since the release of the 2023 Evergreen IRP Updated Action Plan and Roadmap report, the Province of Nova Scotia released the 2030 Clean Power Plan in October of 2023, providing a comprehensive path forward for the province, including NS Power, to achieve 80 percent electricity sales from renewable resources and to phase out coal generation. In December 2023, NS Power filed the Path to 2030 report, providing specific information on how the Company will achieve its 2030 obligations. An update to the Path to 2030 has been provided as **Appendix H**, as directed by the Board in its 2024 ACE Plan Decision. Each of these documents highlights the need for adding and integrating renewable energy resources, while phasing out coal and decreasing total emissions from the emitting fleet.

Figure 58 compares the capital investment forecast in the 2025 ACE Plan for NS Power's thermal, natural gas, and biomass generation units to the Evergreen IRP capital investment forecast. When comparing a single year, or subset of years, from an ACE Plan to a long term planning exercise

such as the IRP, it is important to take into consideration the leveling of investment used for the 25-year capital forecast used within the IRP. With respect to investment profile, it should be expected that the timing of investments will change from long term projections as annual assessments using the latest operational information are essential to optimizing investment. There will be differences in unit investment profiles in future years based on actual utilization and present conditions, which drives the timing of major refurbishment intervals, causing the investment to be lower or higher than the long-term IRP projection in a given year.

Figure 58: Evergreen IRP vs. 2025 ACE Plan Forecast Comparison by Unit



11.1.2 Annual Rating/Prioritization of Capital Projects

In accordance with the NSUARB's 2011 ACE Plan Directive 11 and 2013 ACE Plan Directive 7, below is NS Power's capital project rating criteria.

Pursuant to Section 6.1 of the CEJC, NS Power's generation, transmission and distribution capital projects are rated according to the following criteria:

- Health and Safety: Regulatory Requirements, Operating Permits, Protection of Equipment and Personnel Safety, and JOHSC actions.

- Environment/Regulatory Compliance: Renewable Energy Standards, Greenhouse Gas (GHG) Regulations, or Air Emission Regulations.

- Business Sustainability: SAIDI, SAIFI, CAIDI; unit reliability; system upgrade requirements; code requirements; NERC/NPCC Requirements, or economics (based on payback period, and revenue requirement); requirement to serve.

Technically justified IT projects are broadly rated using the following criteria:

- Customer: service impacts to customers as a result of technical failure

- Finance: financial impacts to the Company as a result of technical failure

- Compliance: safety, environmental, security, legal or regulatory requirements (e.g. NERC/CIP and NI-52 compliance).

- Operating Sustainability: ability for NS Power staff or contractor to perform critical functions of the business.

NS Power's project rating methodology is described in **Section 3.0** above and Section 6.2 of the CEJC. This methodology uses a rating matrix which results in a final rating of 1 to 25. The rating (also termed risk) is developed by determining the "Criticality" (ranked 1 to 5) and "Condition" (ranked 1 to 5) of each asset and multiplying the two to determine the overall risk.

Criticality and Condition values are typically influenced predominantly by the factors discussed above and assigned accordingly. However, other factors may also influence the rating of a project.

Multiple influencing factors, asset risk ratings, and the prioritization of projects ahead of others are subject to the evaluation and professional judgment of NS Power staff and third-party industry experts as appropriate.

Please refer to **Appendix B**, tab 'Risk Rating', which identifies the new projects included in the 2025 ACE Plan, their rating categories and rating values, where applicable.

11.1.3 2025 to 2029 Forecast ACE Plan Expenditures by Functional Class and Spending Program

Pursuant to 2011 ACE Plan Directive 12, NS Power provides its forecast investments by functional class and spending program. Justifications for projects determined as capital investments are prepared on an annual basis. Capital investment on the basis of health and safety, environmental compliance, and requirement to serve remains non-discretionary. **Figure 59** below identifies anticipated sustaining capital by function and specific notable investments included in this ACE Plan. Investment levels from 2025 to 2029 are subject to change based on operating conditions, updated asset assessments, regulatory directives, identification of emerging and/or accelerating risks (such as climate change, or cyber security) or legislation/regulations.

Sustaining capital funding levels represent typical annual investment by function in a given year to sustain the integrity of existing assets. Notable capital projections reflect specific projects. Included in these specific projects are transformative multi-year program investments and asset growth.

Figure 59: Forecast ACE Plan Expenditures by Functional Class and Spending Program
(Millions of dollars)

	2025 ACE	2026	2027	2028	2029
Base Capital Investment					
Thermal Generation	102.0	136.4	117.2	140.1	75.1
Combustion Turbines	13.9	21.9	22.4	10.2	20.1
Hydro Generation	51.3	96.4	116.8	65.2	35.2
Wind Generation	4.5	2.2	2.6	2.8	2.9
Transmission	72.1	104.1	121.0	103.3	99.1
Distribution	153.7	156.0	156.5	157.0	194.8
General Plant	65.1	85.9	80.1	81.7	66.2
Total Base Capital Expenditure	**462.6**	**602.9**	**616.6**	**560.3**	**493.4**
Distribution:					
Distribution R.O.W Widening	28.9	30.6	31.2	31.8	32.0
Transmission:					
Transmission R.O.W Widening	3.0	3.0	3.0	3.0	3.0
ECEI - Reliability Tie	20.6	188.5	247.7	234.3	92.8
ECEI - Energy Storage	133.6	53.8	(3.3)	-	-
ECEI - Synchronous Condenser	27.2	118.2	98.4	-	-
Generation:					
Hydro Infrastructure Renewal					
Wreck Cove LEM	16.5	0.7	-	-	-
Total Notable Capital	**229.8**	**394.8**	**378.5**	**268.9**	**127.8**
Total Annual Capital Investment	**692.4**	**997.7**	**993.6**	**829.5**	**621.2**

11.1.4 Cost Minimization

The Board's 2019 ACE Plan Decision directed NS Power to provide specific examples of the Company's cost minimization efforts for the prior year in its ACE Plan applications. The Board's most recent directive from the 2023 ACE Plan Order provided as follows:

> Continue to provide examples of cost minimization efforts over the previous year in future ACE Plan applications as directed in Paragraph [122] of the decision.

Paragraph 122 the Board's 2023 ACE Plan Decision provided as follows:

> [122] In its application, NS Power noted that as its cost minimization efforts are shared, considered, and actively included in the budgeting process for future capital projects, this will likely result in diminishing opportunities to further reduce costs for similar projects going forward. As such, this may result in fewer or less impactful examples of cost minimization as the Company continues to track this information. The Board agrees with this assertion. However, the Board continues to find the cost minimization examples and related supporting information provided by NS Power to be useful and informative, and it remains important to track. As such, the Board directs NS Power to continue to provide such information in subsequent ACE Plan applications, per Directive 3 of the Board's 2022 ACE Plan Order. Further, the Board encourages NS Power to incorporate its cost minimization successes into future capital project planning to ensure improvements in cost minimization, schedule adherence, and risk management.

The Board's 2024 ACE Plan Decision provided the following:

> …the Board continues to find the cost minimization examples and related supporting information provided by NS Power to be useful and informative, and it remains important to track. As such, the Board directs NS Power to continue to provide such information in subsequent ACE Plan applications, per Directive 7 of the Board's 2023 ACE Plan Order. Further, the Board continues to encourage NS Power to incorporate its cost minimization successes into future capital project planning to ensure improvements in cost minimization, schedule adherence, and risk management.

Cost minimization is embedded into all stages of capital project development and execution. NS Power continues to follow its processes through project development and execution, and leverages resources and procurement across multiple projects to minimize costs. These practices continue to be the primary means of achieving cost minimization with the largest benefit of these achieved in the early stages of project planning.

In response to the Board's directive, NS Power has identified a number of areas where costs were minimized and has categorized specific cost savings into the three categories outlined in **Figure 60** below. While not included in the table below, NS Power has been successful in pursuing government related funding for multiple projects (such as ECEI – Energy Storage, ECC – Dynamic

Line Ratings, and ECC – Optimization Tools, for example) leading to savings in excess of $125 million.

Figure 60: Cost Minimization Savings

Savings Category	Savings ($M)
A: Design & Project Scoping	0.6
B: Procurement Process/Negotiated Savings	2.3
C: Project Execution/Construction Efficiencies	1.0
Total	**3.9**

The items in **Figure 60** are presented in the order in which they occur over the course of completing capital projects. In accordance with the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK), "the ability to influence cost is greatest at the early stages of the project, and this is why early scope definition is critical".[28] Cost minimization efforts are embedded into NS Power's processes at the early scope definition and design phases of projects. Consistent with the PMI's PMBOK, NS Power's ability to influence cost outcomes for its projects is greatest at these early stages of the project.

As cost minimization efforts through all phases of a project are shared, considered, and actively included in the budgeting process for future capital projects, opportunities to further reduce costs for similar projects diminish going forward. As such, this will likely result in fewer, or less impactful, examples of cost minimization as the Company continues to track this information.

In accordance with the Board's direction in the 2023 ACE Plan Order and 2024 ACE Plan Decision, please refer to **Appendix E** for specific examples of cost minimization efforts with savings categories identified as summarized in **Figure 60**.

[28] A Guide to the Project Management Body of Knowledge (PMBOK) Sixth Edition, page 231.

11.1.5 Impact of Reliability Projects

The NSUARB's 2013 ACE Plan Decision provided the following directive:

> …the Board expects NSPI to monitor the impact of the deferral of reliability projects in the original 2013 ACE Plan closely and to provide a report on the results in the next ACE Plan.[29]

Pursuant to NS Power's commitment noted in the 2015 ACE Plan Terms of Consensus, this directive is expanded to include additional information regarding continued sustaining capital investments and maintaining reliability performance.

The NSUARB's 2017 ACE Plan Order provided the following directive:

> The Board directs NSPI to identify and list any proposed capital investments related to performance standards established by the Board in future ACE Plan applications.[30]

The majority of T&D projects in the 2025 ACE Plan will contribute to having a net positive impact on the metrics tracked under performance standards. The projects are selected based on the asset management methodology described in **Section 3.0** and pursuant to Section 6.2 of the CEJC, guiding investments to where they are needed most.

The NSUARB directed NS Power to continue providing the same information with respect to reliability and severe weather events notwithstanding the NSUARB's approval of the performance standards in 2017 and the Company's obligations to report on those standards:

> …[T]o what extent, if any, certain aspects of the information set out in Section 8.1.7 of the 2017 ACE Plan will be reproduced in the report required by the Performance Standards Decision remains to be seen.

[29] M05339, NS Power 2013 Annual Capital Expenditure Plan, NSUARB Decision, May 27, 2013, page 44, line 174.
[30] M07745, NS Power 2017 Annual Capital Expenditure Plan, NSUARB Order, April 4, 2017.

> It is not clear such items as, for example, plans for replacement of aging transmission and distribution equipment, and storm performance information, beyond the 48-hour restoration metric, will be fully explored in the context of performance standard metrics reporting.
>
> As there is some uncertainty, and a part of the information provided in Section 8.1.7 is derived from an agreement between stakeholders, as part of the 2015 ACE Plan process, the Board will not direct any changes to the current ACE Plan reporting related to reliability at this time. The Board will monitor the ongoing relevancy of this part of the ACE Plan.
>
> The first report arising from the Performance Standards Decision is due March 31, 2018. Once that report has been filed and analyzed, the matter should be revisited in the context of a future ACE Plan. [31]

The NSUARB's Order pertaining to the Property and Assets Inquiry provided the following directive:

> To develop and implement a process that reviews actions resulting from risks and opportunities to determine whether they have been effective or could be improved. [32]

In NS Power's subsequently-filed Action Plan Update, [33] the Company noted that it would address this through the ACE Plan, and initiate this effort via the 2025 ACE Plan. Specifically:

> For reliability-focused distribution projects > $1 million, NS Power commits to providing the circuit-level risk rating which led to the project being planned and the subsequent post-project rating. As the risk ratings have multiple inputs, NS Power will define which of the inputs are anticipated to be improved through project execution. NS Power will provide an update for circuits which meet these criteria for the five years after the project is put into service. [34]

The risk rating for a feeder follows the methodology described in **Section 3.0** – utilizing both criticality and condition inputs. Specifically for distribution feeders, the criticality assessment

[31] M07745, NS Power 2017 Annual Capital Expenditure Plan, NSUARB Decision, April 4, 2017, paragraphs 98 to 101.
[32] M11067, Property and Assets Inquiry, NSUARB Order, March 25, 2024.
[33] M11067, Property and Assets Inquiry, NS Power Action Plan Update, September 26, 2024.
[34] Ibid.

includes factors such as usage (kWh sales), regulatory consequences, customer count, redundancy, and ease of access. The condition score includes inputs from performance results, vegetation condition, load conditions, and feeder inspections. Note that subject matter expertise is applied on top of risk rating scores to determine the most appropriate mitigating action to address the resultant risk.

Within the 2025 ACE Plan, the Distribution projects included for approval, and associated risk rating inputs are provided in **Figure 61** below.

Figure 61: 2025 ACE Plan Distribution Projects for Approval with Risk Rating Inputs

Project	Feeder Criticality	Condition Inputs				
		Load & Balance	Outage Frequency (CKAIFI)	Outage Duration (CKAIDI)	Feeder Inspection	Vegetation Condition
91W-411 Labelle Road Phase Extension	5	5	4	4	3	3

Note: Projects that are planned for subsequent submittal are not included in this list as scoping and project analysis is not yet completed, therefore these inputs are subject to change.

Updates to the inputs of the condition score for these projects will be provided in subsequent ACE Plans for five years following the in-service date of the project.

The NSUARB's Decision pertaining to the 2023 Performance standards provided the following directive:

> The Board agrees that a comprehensive written version of NS Power's five-year reliability plan is needed to understand how service improvements will be achieved and against which progress in achieving the performance goals can be tracked. This plan must include specific actions and related timing, demonstrate why these specific investments were selected and quantify the level of reliability or resilience improvement expected from each investment. The Board directs NS Power to prepare such a plan, which is to be filed by December 31, 2024.[35]

[35] M11627, NS Power 2023 Annual Performance Standards Report, NSUARB Decision, September 9, 2024, page 15.

In accordance with the Board's directive, NS Power is preparing its Five-Year Reliability Plan that will be filed with with Board by December 31, 2024, and respectfully requests the Board consider it as an exhibit in the 2025 ACE Plan proceeding. NS Power intends to include updates to its reliability plan as an appendix to the ACE Plan in future years.

Reliability Strategy

To meet reliability challenges from severe weather and climate change and achieve reliability improvements on the T&D system, enhanced reliability performance analysis, technological innovation, targeted mitigating measures, and new approaches to the way NS Power executes work are necessary. This approach is driven by and aligned with NS Power's asset management strategy for T&D assets and includes implementation by the Reliability team. In addition to the dedicated areas of scope and responsibilities for the Reliability team (vegetation management, transmission line and distribution feeder inspection, capital project engineering, distribution standards, performance standards reporting, and stakeholder engagement related to reliability), the team works closely with others across the broader Energy Delivery team as well as the Enterprise Asset Management (EAM) team to prioritize and execute work that is aimed at driving reliability improvements for NS Power's customers.

More detail regarding the Company's approach and initiatives to address customer reliability is provided in the Five-Year Reliability Plan.

Reliability Director

The NSUARB's 2023 ACE Plan Order Directive 3 provided as follows:

> 3. Provide an update on the progress of the Director, Reliability Implementation, and his team.

The NSUARB's 2024 ACE Plan Decision provided the following:

> [103] In the Board's 2023 ACE Plan Decision [2023 NSUARB 159], NS Power was directed to provide an update in the 2024 ACE Plan on the progress of the Director, Reliability Implementation and his team. NS Power provided this update and the Board finds it informative. The Board looks forward to additional updates in the 2025 ACE Plan.[36]

The Reliability Team is focused on executing and communicating NS Power's Five-Year Reliability Plan for improving the reliability of the T&D system and making the power system more resilient. The Reliability Team is executing an evergreen Five-Year Reliability plan that is targeting the achievement of performance-based standards while also improving customer satisfaction. More details will be included in the Five-Year Reliability Plan.

Reliability and Resilience Metrics

The NSUARB's 2024 ACE Plan Order provided as follows:

> 2. The Board directs NS Power to consider the issue of developing better metrics and analysis to evaluate the cost-effectiveness of resiliency investments. These should be capable of both quantifying the expected benefits of a resiliency investment and measuring the effectiveness of that specific intervention once it is in place. NS Power is to provide this report to the Board in its 2025 ACE Plan application.
>
> 3. The Board directs NS Power to continue to study the issue of Normalized SAIDI and provide further information about potential alternatives to the manner in which Normalized SAIDI is presented, in the 2025 ACE Plan.
>
> 4. The Board directs NS Power to consider if there are alternative metrics to assess investments to address reliability in the context of proposed capital expenditures, and report back to the Board in the 2025 ACE Plan.[37]

Similarly, the NSUARB's Order pertaining to NS Power's 2022 Distribution Routines ATO provided as follows:

[36] M11458, NS Power 2024 Annual Capital Expenditure Plan, NSUARB Decision, August 13, 2024, page 36.
[37] M11458, NS Power 2024 Annual Capital Expenditure Plan, NSUARB Order, August 13, 2024.

1. NS Power is directed to consider the issue of developing better metrics and analysis to evaluate the cost-effectiveness of resiliency investments. These should be capable of both quantifying the expected benefits of a resiliency investment and measuring the effectiveness of that specific intervention once it is in place. NS Power is to provide this report to the Board in its 2025 ACE Plan application.[38]

Metrics

Over the course of the last year, NS Power has extensively considered various available alternative reliability metrics. The reliability metrics included in NS Power's Performance Standards reporting, including SAIDI, SAIFI, CKAIDI, and CKAIFI, measure reliability effectively and were developed through robust stakeholder engagement. NS Power's position is that these metrics are comprehensive and are standard in the industry. They provide straightforward, quantitative measures of reliability that are easy to communicate to regulators, stakeholders, and customers. These metrics remain foundational for evaluating NS Power's reliability. NS Power will continue to evaluate newer measures that address emerging issues that could be used in conjunction with these foundational metrics in the future.

NS Power has considered the issue of developing metrics to evaluate the cost-effectiveness of resiliency investments. Overall, there has been limited or no adoption of a standard set of industry metrics by other utilities based on research undertaken by NS Power. Some academic analysis has been undertaken and potential approaches have been proposed, with the report "Application of a Standard Approach to Benefit-Cost Analysis for Electric Grid Resilience Investments"[39] providing some insights on this subject.

Many of the metrics proposed in these studies are inputs that are not provided or necessarily in the control of the electric utility, but rather by Government agencies, communities, universities, research institutions, and other stakeholders. However, Table 6 of the report does suggest

[38] M11169, NS Power 2022 Distribution Routine ATO, NSUARB Order, June 27, 2024.
[39] https://www.synapse-energy.com/sites/default/files/Standard_Approach_to_Benefit-Cost_Analysis_for__Electric_Grid_Resilience_Investments_19-007.pdf

potentially applicable metrics focusing on the prudent use of employees during emergency response ("Reducing Emergency Staff Deployment Costs") and reducing infrastructure impacts ("Avoiding Energy Infrastructure Damages"). NS Power is currently investigating whether there is value in applying these metrics to measure resiliency on its system and how they might be calculated and evaluated.

Additionally, NS Power has also identified that the concept of a "Resilience Gap" may be another reference point to measure the cumulative impact of resilience investments over time. As shown in Figures 7 and 9 of the S&C Electric Company report titled "Trends in Reliability and Resilience –the Growing Resilience Gap",[40] they propose that the "Resilience Gap" measures the difference between all-in SAIDI (inclusive of major events) versus SAIDI with these major events excluded. While using such a wide range of utilities for comparison overlooks the inherent differences in operating environment for each utility and the impacts of those differences on SAIDI performance, NS Power believes that the "Resiliency Gap" is a potential complementary measure. As investments are made in the transmission and distribution system over time, a slowing or narrowing of the resilience gap may demonstrate the positive impact of such investment. As outlined in the referenced report, the resilience gap in Canada expanded between 2008 and 2021. As outlined in Figure 7 in the referenced report, the US data shows an even greater resilience gap, which would be more representative of the operating context experienced in Nova Scotia (considering jurisdictions along the eastern seaboard). NS Power is evaluating if "Resilience Gap" could be a potential metric worth further exploration.

Finally, as outlined in the report titled "Resilience for Black Sky Days",[41] some Public Utility Commissions (PUCs) are specifying service restoration requirements during major outage events. For example, Maryland's PSC has established the following requirement:

> During each calendar year, a utility shall restore service within 50 hours, measured from when the utility knew or should have known of the outage to at least 95% of its customers experiencing sustained interruptions during Major Outage Events

[40] Trends in Reliability and Resilience—The Growing Resilience Gap
[41] Structure of the Analysis:

where the total number of sustained interruptions is less than or equal to 400,000 or 40 percent of the utilities total number of customers, whichever is less.

This resilience metric in the state of Maryland is largely similar to the existing Performance Standards metric for customer restored in the first 48 hours of Major Events that NS Power currently reports on in Appendix L of its Annual Performance Standards Report. NS Power considers a Major Event restoration metric such as Customers Restored in 48 Hours to potentially be a useful measure of the Company's resiliency with respect to its investments in storm hardening as well as emergency preparedness and response. NS Power will continue to evaluate how to apply this metric, and potentially further variations on it, in a resiliency context.

While there is certainly value in some recommendations included in available literature, further work is required to fully consider both the applicability and effectiveness of resilience metrics proposed in these studies and other emerging research along with continued engagement with industry to identify appropriate metrics that will yield valuable insights for the benefit of customers. To this end, NS Power continues to participate in industry groups such as CEATI and Electricity Canada which have included resiliency as a key focus for collaboration. In particular CEATI has initiated a Grid Resiliency working group kicking off in Q2 2025 that the Company has signaled its intent to participate in. Through this engagement, and ongoing collaboration, the Company anticipates that a combination of framework and suitable set of metrics can be developed.

In addition to the industry collaboration detailed above, the Company is open to discussing potential approaches with Board staff and stakeholders. However, given the current lack of development and industry adoption to date, it is premature at this stage to suggest specific metrics that would provide clarity and value with respect to resilience without NS Power undertaking further research and development. As discussed above, NS Power is committed to this development with its industry partners.

Normalized SAIDI

NS Power has continued to study the impact of adverse weather on SAIDI and in particular, the hours of wind gusts >80km/h. As discussed in previous ACE Plan proceedings, performance standards reports, as well as other proceedings, it is NS Power's position that the increasing frequency and severity of adverse weather conditions continue to play a role in overall system performance, even when controlling for Major Event Days. NS Power does not propose that this approach is a replacement for traditional metrics, but rather, wind-normalized SAIDI is an additional, complementary reference point to gauge performance trends under changing (worsening) climatic conditions, a perspective that is difficult to present and compare using traditional, un-normalized metrics. With only some exceptions, such as 2023's flooding and lightning severe weather events, wind continues to represent the largest contributor to overall reliability challenges (adverse weather and tree contacts) at NS Power. Consequently, the Company believes that strong consideration of this weather factor provides valuable, although not perfect, insights into the effectiveness of reliability investments and programs. This approach is consistent with the overall necessity to consider the influence of weather understood by industry and illustrated in studies such as EPRI's "Weather Normalization of Reliability Indices".[42]

Using the Normalized SAIDI approach relies on a conservative and consistent measure of wind impact over multiple years, simply the count of hours where a gust equal or greater to 80 km/h is recorded at five Environment and Climate Change Canada (ECCC) weather stations across the province. 80 km/h was chosen as the threshold due to the historically observed increase in outage impacts at and above this level of wind gusts and its use as a warning level for pre-storm planning. This count of hours does not require further interpretation by NS Power and does not overstate the impact of wind gusts by relying only on the lower bound for inclusion for each hour. Per ECCC sampling methodology (MANOPS) it does not assume sustained duration, simply that one gust is recorded during the sampling period. Since only one sampling period occurs each hour, should additional, higher gusts occur, they would not be considered, and the hour would still be counted as a single instance of a gust greater or equal to 80 km/h. This is a more conservative approach

[42] Weather Normalization of Reliability Indices. EPRI, Palo Alto, CA: 2008. 1015857

and would, if anything, potentially underestimate the wind impacts. Since wind for all years considered in the analysis are totaled in this same way under the same methodology, NS Power can make use of a consistent and validated meteorological reference point provided by ECCC that can be compared year over year.

However, NS Power recognizes that improvements to this approach are possible and continues to pursue potential enhancements to its use of Normalized SAIDI as a complementary weather-normalized metric. In particular, NS Power is evaluating the quantification of gusts in excess of 80 km/h, in order to better consider the impacts from more extreme conditions experienced during severe weather events such as hurricanes. The forces experienced by vegetation and overhead equipment from wind increases non-linearly with increasing speed of gusts. All else being equal, a wind gust of 90 km/h, 100 km/h, or higher would deliver proportionally more force to trees and NS Power's equipment, and consequently would be more damaging, than a gust at only 80 km/h. Accounting for this variability in wind gust severity could provide additional value in interpreting performance over a wider range of severe weather events and the relative effectiveness of reliability investments. NS Power is in the process of reviewing historic ECCC weather data to produce a more refined view of these variable forces. The Company anticipates that it can present an updated version of Normalized SAIDI in consideration of this enhancement for the 2024 Performance Standards Report.

Finally, as with the approach to resilience metrics described previously, NS Power continues to engage with its industry colleagues to identify and explore developments in weather normalization of performance metrics where applicable.

Reliability Statistics

As shown in **Figure 62** and **Figure 63** below, with the exception of years with significantly challenging weather conditions, NS Power's annual outage frequency and duration continues to compare favourably with the average of Atlantic Canada utilities. Over the ten year period 2014-2023 NS Power exceeded the Atlantic Canadian utilities average in both frequency and duration

in 2019, 2022 and 2023 due to the significant challenges posed by Hurricane Dorian, Hurricane Fiona, and Hurricane Lee, respectively. These extreme weather events represented the significant outliers from typical performance trends in the region.

Figure 62: Annual Atlantic Canada Outage Frequency

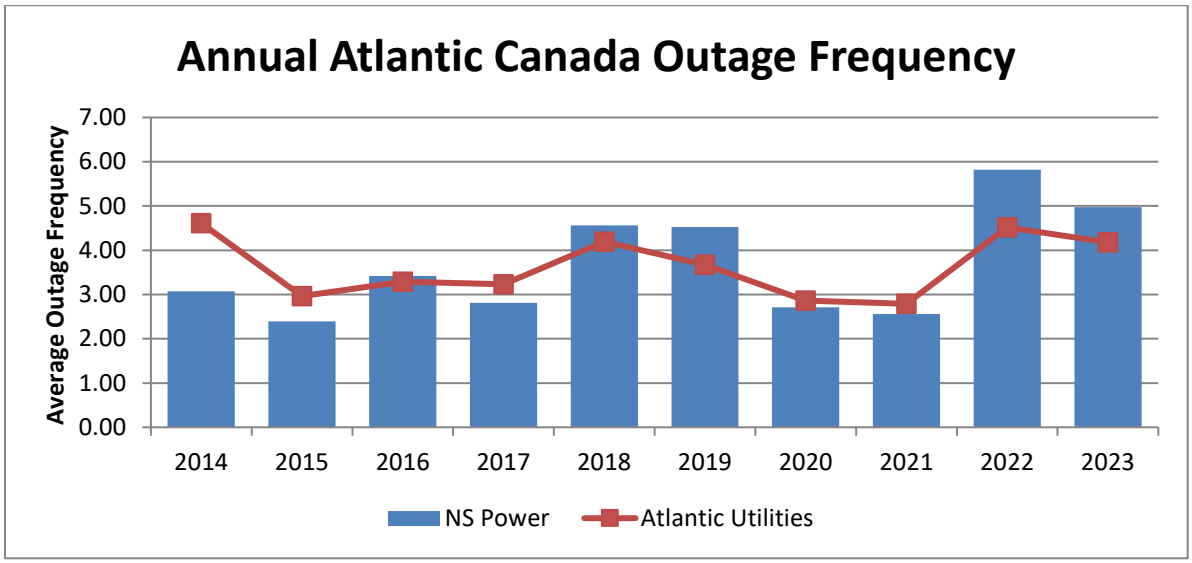


Figure 63: Annual Atlantic Canada Outage Duration

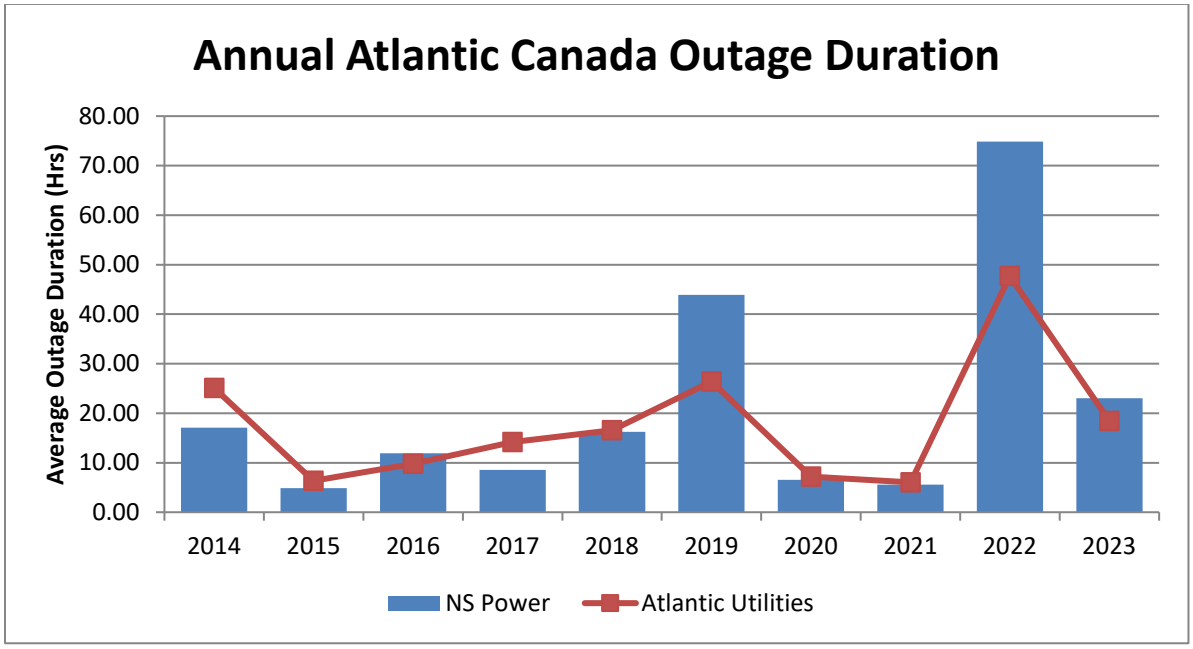


Figure 64 and **Figure 65** below represent NS Power's reliability statistics with Major and Extreme Events (such as Hurricanes Dorian, Fiona, and Lee and as defined by IEEE-1366) removed from the data. This shows a largely normalized comparison between yearly reliability performance. However, performance observed in some years were largely the result of a significant number of localized storm events, that while falling short of the IEEE-1366 standard for a major event, contributed to more frequent and longer outages than would have been experienced in previous years. This in turn led to an increase in both SAIFI and SAIDI. 2024 performance has been similarly influenced by three Significant Event Days (SEDs) leading to above normal outage impacts not excluded by IEEE-1366, as well as lingering impacts from these severe weather events through the year. The 10 year trend shows the impact of SEDs and overall challenging weather conditions in recent years.

Figure 64: NS Power Annual SAIFI (Major/Extreme Events Excluded)

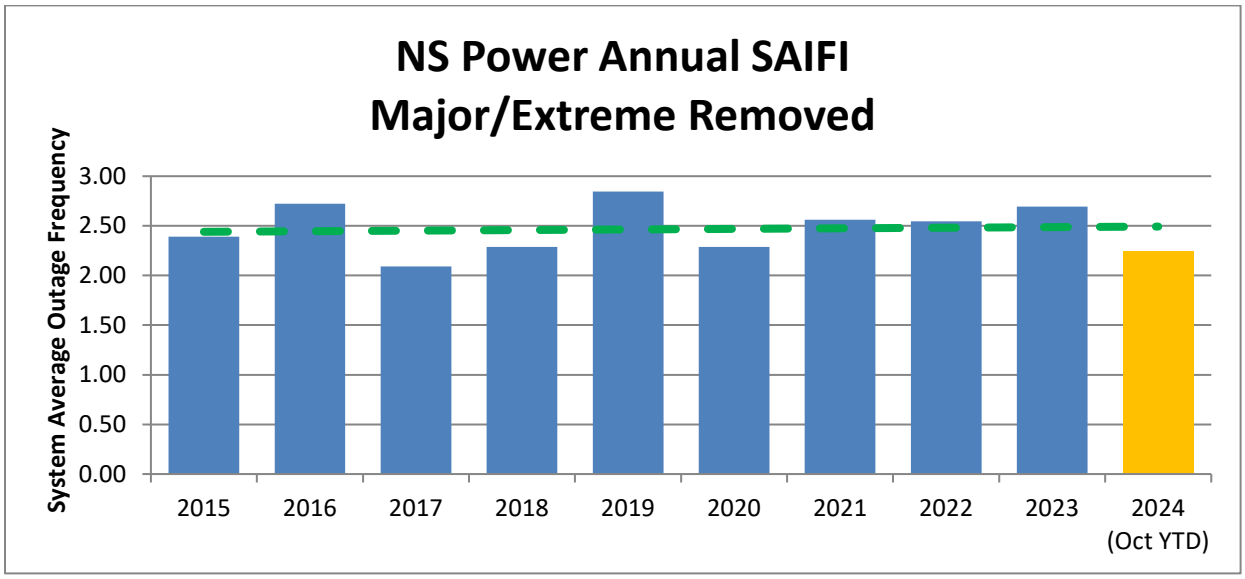


Figure 65: NS Power Annual SAIDI (Major/Extreme Events Excluded)

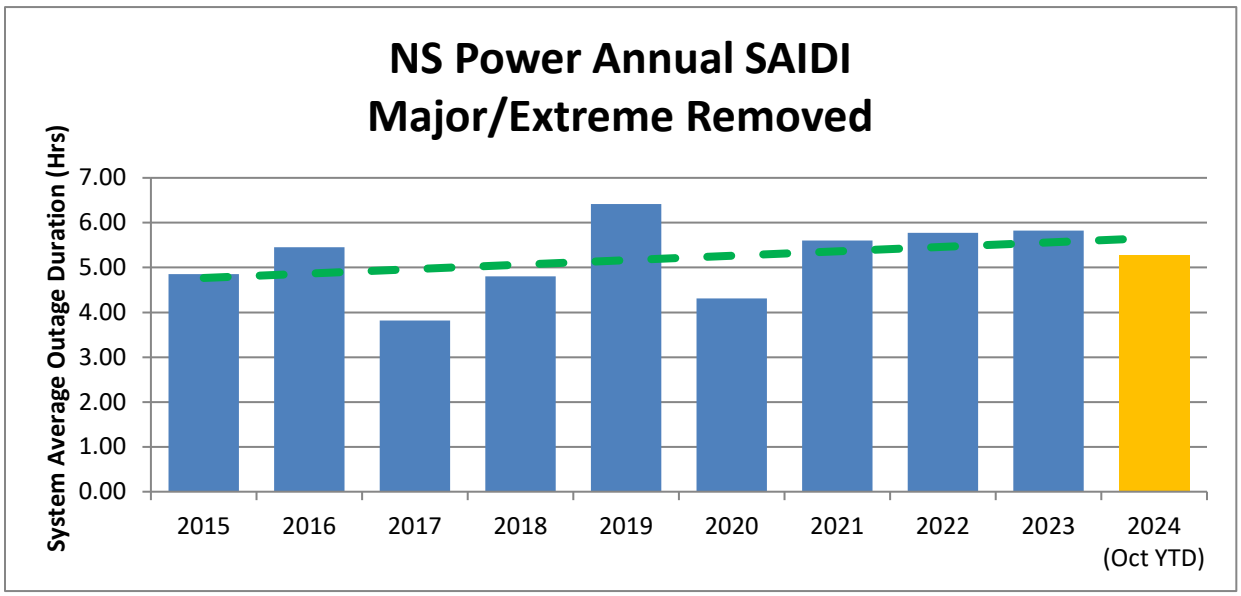


Figure 66 and **Figure 67** below represent NS Power's reliability statistics with Major and Extreme Events included. There have been no Major or Extreme Events between January 1-October 31, 2024. Accordingly, the current 2024 SAIFI and SAIDI values are the same for both Major/Extreme Events Removed and Included.

Figure 66: NS Power Annual SAIFI (Major and Extreme Events Included)

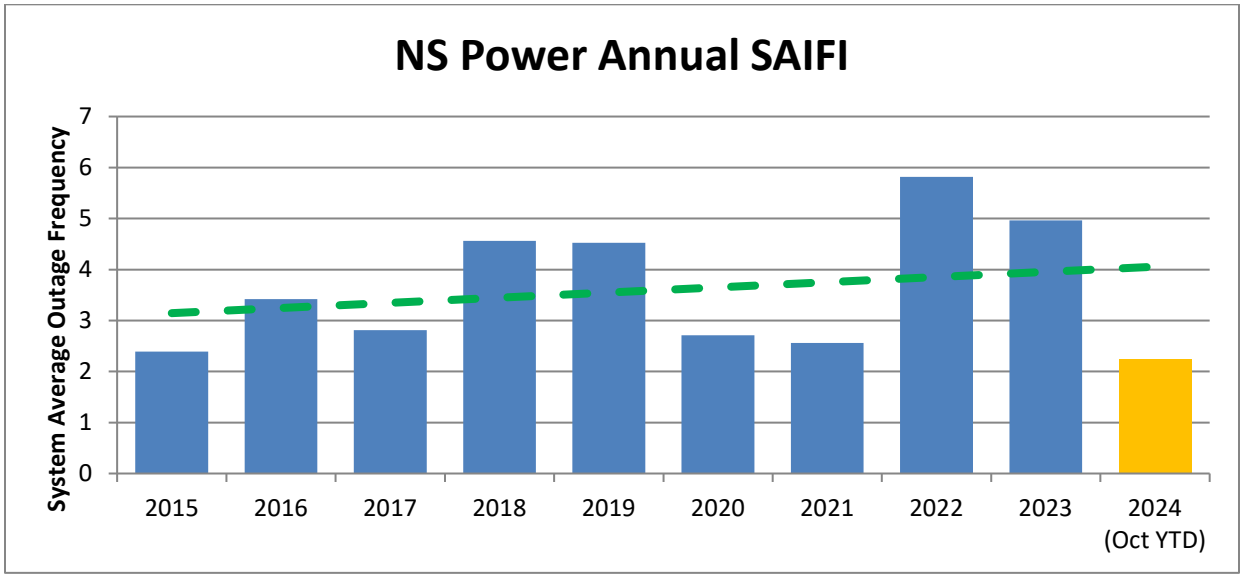
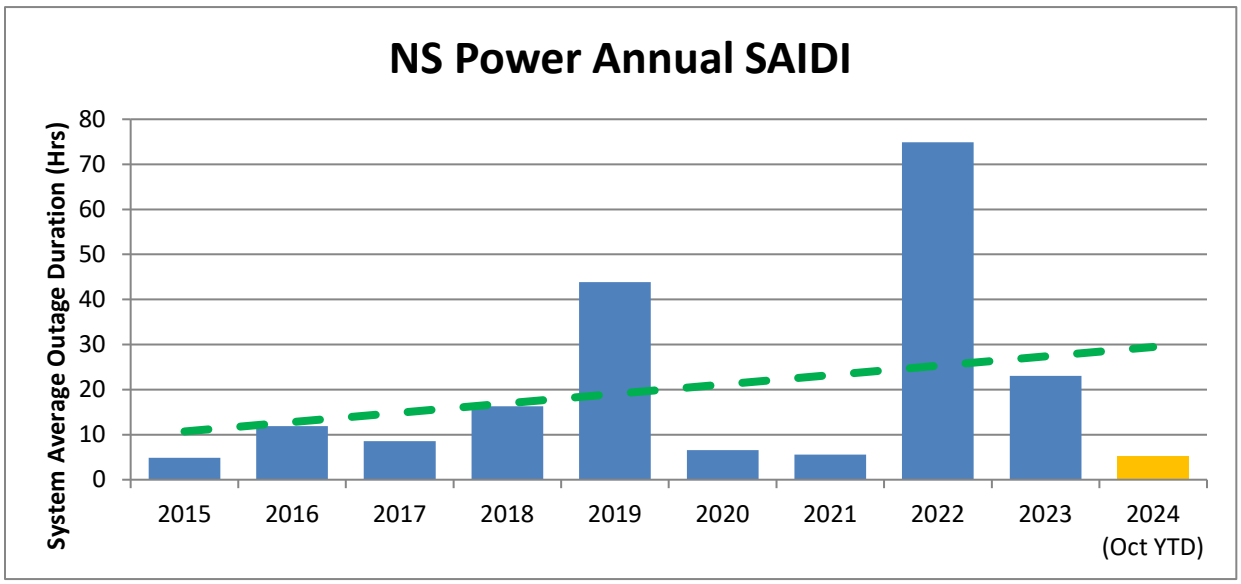


Figure 67: NS Power Annual SAIDI (Major and Extreme Events Included)

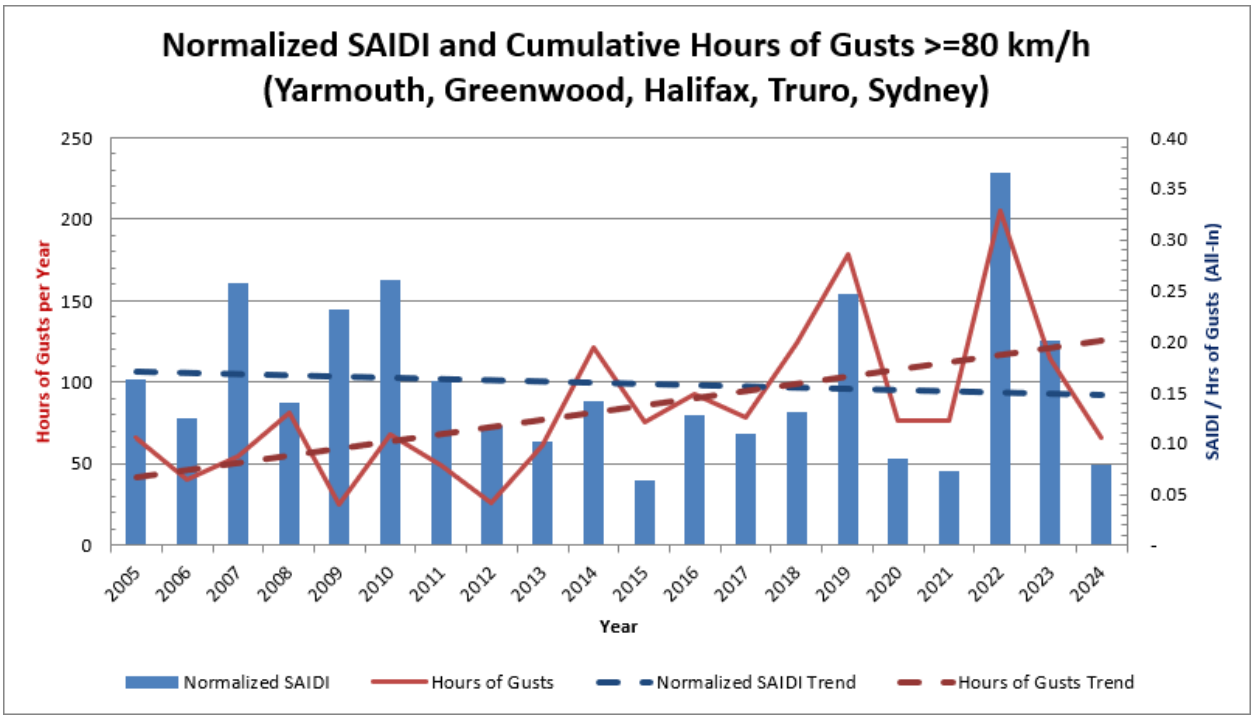


The reliability performance for overall SAIFI and SAIDI are strongly correlated with the number of major and extreme events that occur during the calendar year. NS Power continues to see severe and more frequent weather events (Arthur 2014, Matthew 2016, Dorian 2019, Fiona 2022, Lee 2023) as a trend which is expected to continue into the future. However, NS Power's typical performance compares favourably with the Atlantic Canada outage average for frequency and duration, and the Company continues to see positive indications overall for SAIFI and SAIDI when adjusted for weather. Continued investment in annual rights-of-way vegetation clearing and other capital investment initiatives noted herein are expected to continue to support sustaining reliablity and improving resiliency over the long term.

Figure 68 details the SAIDI performance normalized for hours of wind gusts greater or equal to 80 km/h. Over the 2005-2023 time period, NS Power's normalized SAIDI result has trended downward (i.e. improving) notwithstanding the increasing trend of wind gusts greater or equal to 80 km/h over that same period. This illustrates the positive impact of targeted investments in reliability of the overall transmission and distribution system in response to a changing climate. However, this approach does not account for the significant impact from adverse environment and non-wind related adverse weather such as the significant wildfire, lightning, and flooding events

experienced in the province in 2023. Consequently SAIDI normalized for wind gusts does not follow the same trend in 2023 as it did for 2005-2022. **Figure 68** shows SAIDI and Hours of Gusts to October 31, 2024.

Figure 68: Normalized SAIDI and Cumulative Hours of Gusts >= 80km/hr



Outage Causes

Historically, two of the leading causes of NS Power customer outages for all days (all event days included) are tree contacts and defective equipment. Outage analysis of these causes and NS Power's associated investments are described in more detail below. As elaborated in these sections, both tree contact and defective equipment related outages are influenced by the prevailing weather conditions, further contributing to the overall effects of adverse weather on system performance.

Tree Contacts

Since 2014, tree contacts continue to be one of the largest sources of outage hours for NS Power's customers. **Figure 69** and **Figure 70** below show both customer interruptions and customer hours of interruption due to tree contacts under normal and severe weather conditions.

Figure 69: Annual Tree Contact – Customer Interruptions

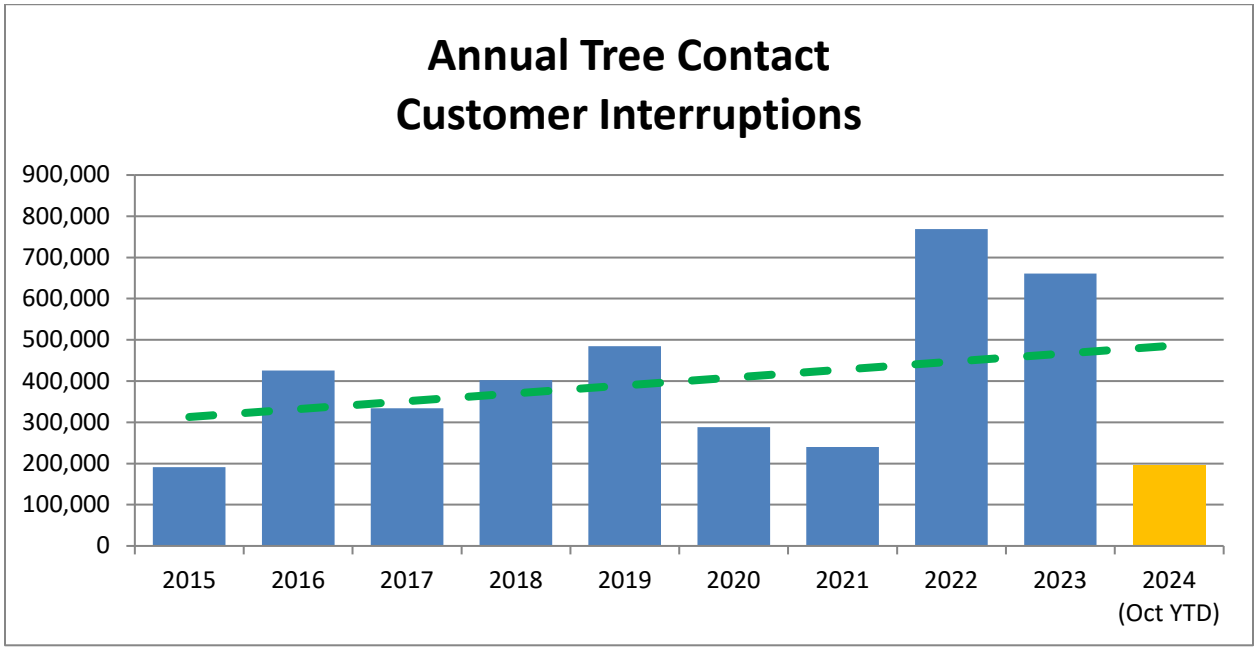


Figure 70: Annual Tree Contact – Customer Hours of Interruption

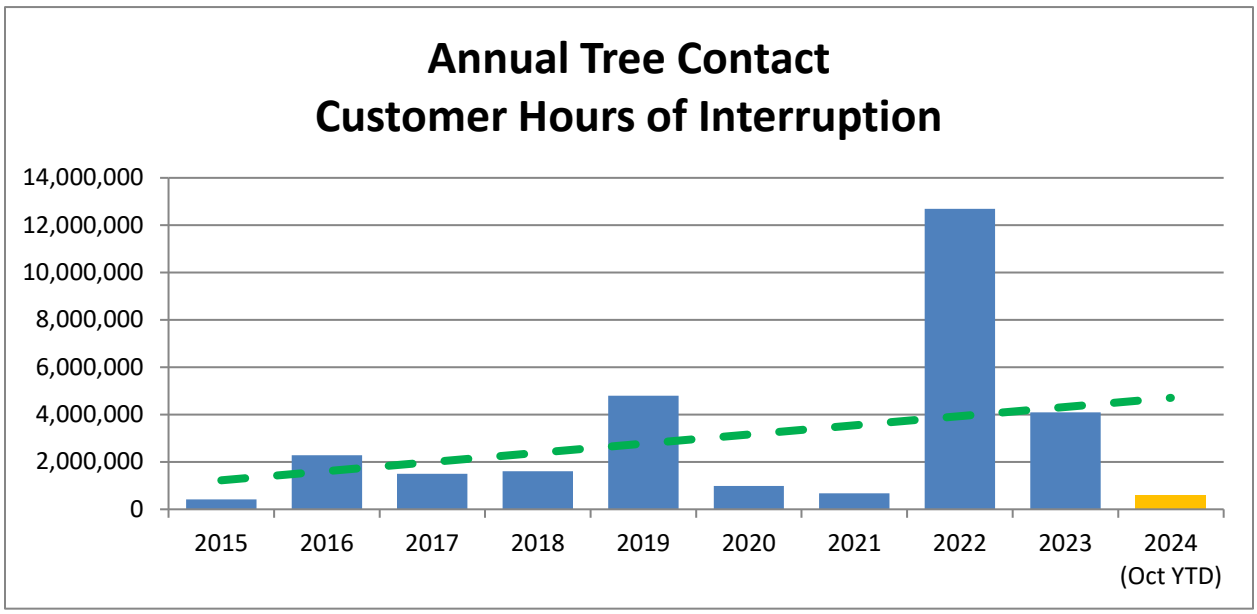


Figure 71 and **Figure 72** below show the tree contact data normalized with Major and Extreme Events removed. With these events removed, the data demonstrates the vegetative effects of major storms and their impact for months following the extreme event.

Figure 71: Annual Tree Contact – Customer Interruptions (Major/Extreme Events Removed)

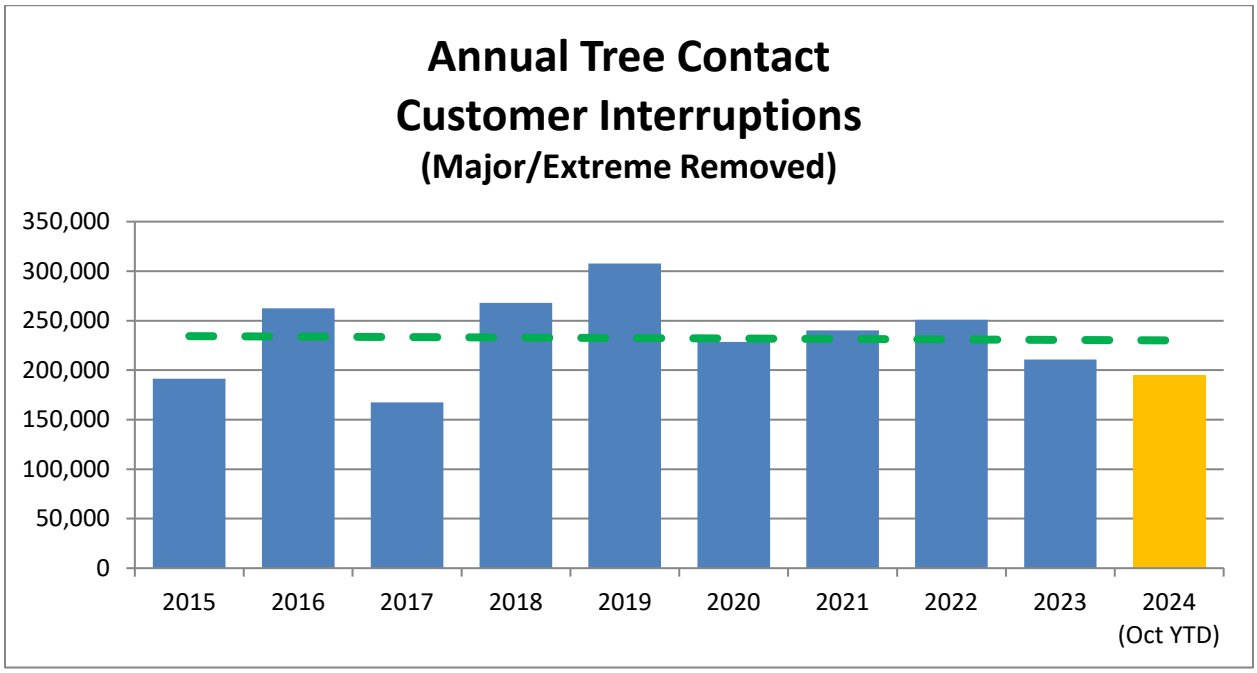
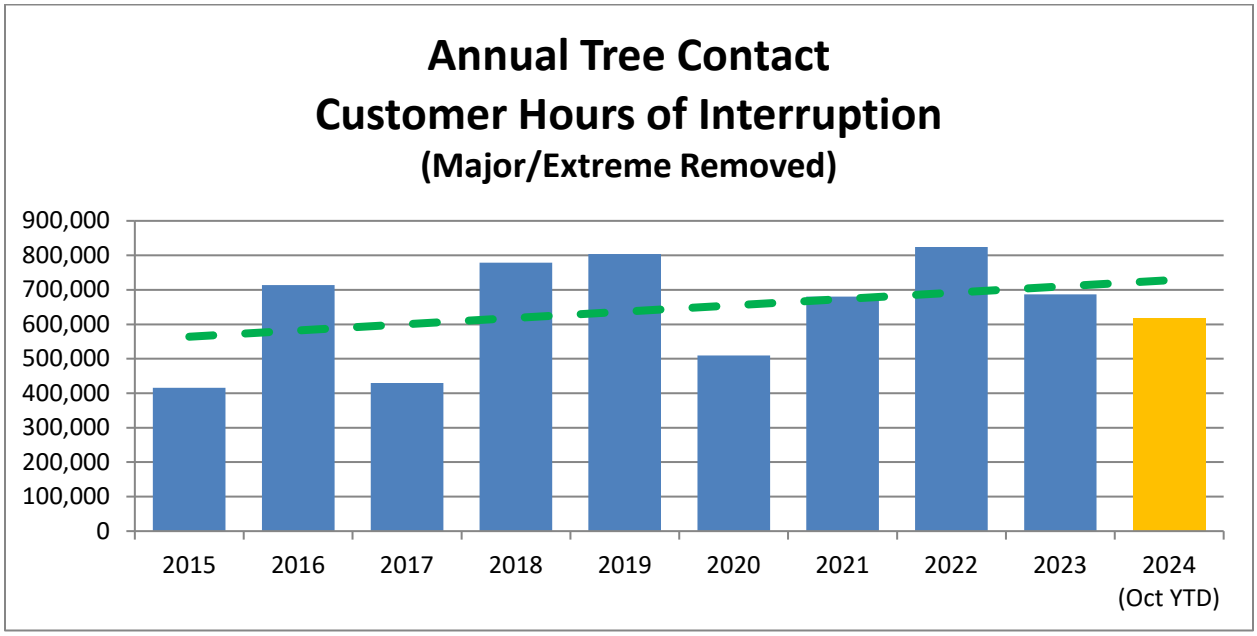


Figure 72: Annual Tree Contact – Customer Hours of Interruption (Major/Extreme Events Removed)



Significant amount of customer hours from non-MED days due to adverse weather in certain years, such as 2021 and 2022 are not excluded above and do contribute to the volume of tree contacts experienced. Despite the increased frequency of severe weather events and higher MED thresholds, there is a positive trend in reducing customer impact compared to the last 5 years (2019 - 2023). This demonstrates that effective measures are in place, successfully preventing tree contact outages and maintaining stable outage durations, even under increasingly challenging conditions.

In a continued effort to minimize storm effects on overall reliability, the following investments are included in NS Power's 2025 ACE Plan for transmission and distribution vegetation management. These targeted investments for managing vegetation aim to mitigate outage frequency and duration, while seeking to improve access to the system for restoration crews.

- CI C0061521 – New Distribution Rights-of-Way Phase 10
- D010 Distribution Right-of-Way Routine
- T010 Transmission Right-of-Way Routine

Defective Equipment

Figure 73 and **Figure 74** below show both the reliability results realized through upgrades and replacements of targeted distribution equipment as well as the significant impact of adverse weather on equipment.

Asset Reliability teams are continuing to investigate improvements in maintenance strategies through identification of failure modes for asset classes with the highest contributions to customer impacts. In 2018 and 2019, NS Power experienced an increase of primary aerial conductor failures leading to a higher than typical contribution to frequency and duration of outages caused by failed equipment when compared to recent history. These years were also the most challenging years for severe weather events. The increase in failed primary aerial conductors is believed to be attributed in large part to the added stress on existing infrastructure due to the high number of hours that

winds have exceeded warning levels. The Company observed similar trends in 2022 and 2023, aligned with the severe weather events experienced during these years, including the most significant adverse weather event in Nova Scotia's history, Hurricane Fiona in September 2022, and Post Tropical Storm Lee in September 2023. As anticipated, NS Power's approach to targeted asset investments has contributed to overall improved equipment reliability performance. In 2024, the impact of equipment failures is trending toward one of the better years for minimizing customer impact, with noticeable improvements compared to the last five years (2019 - 2023) and fewer interruptions for customers.

Figure 73: Annual Defective Equipment – Customer Interruptions

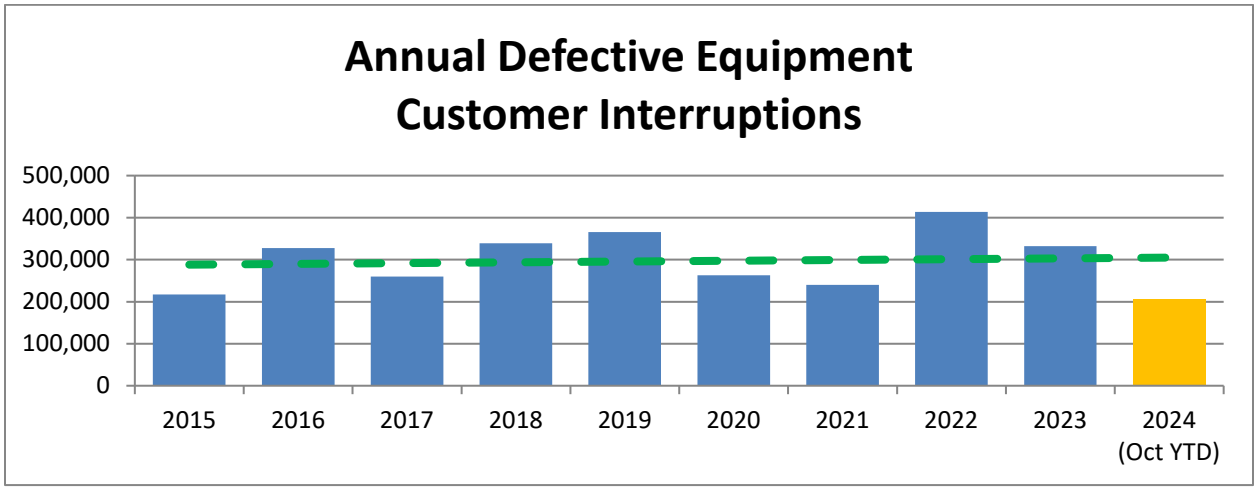
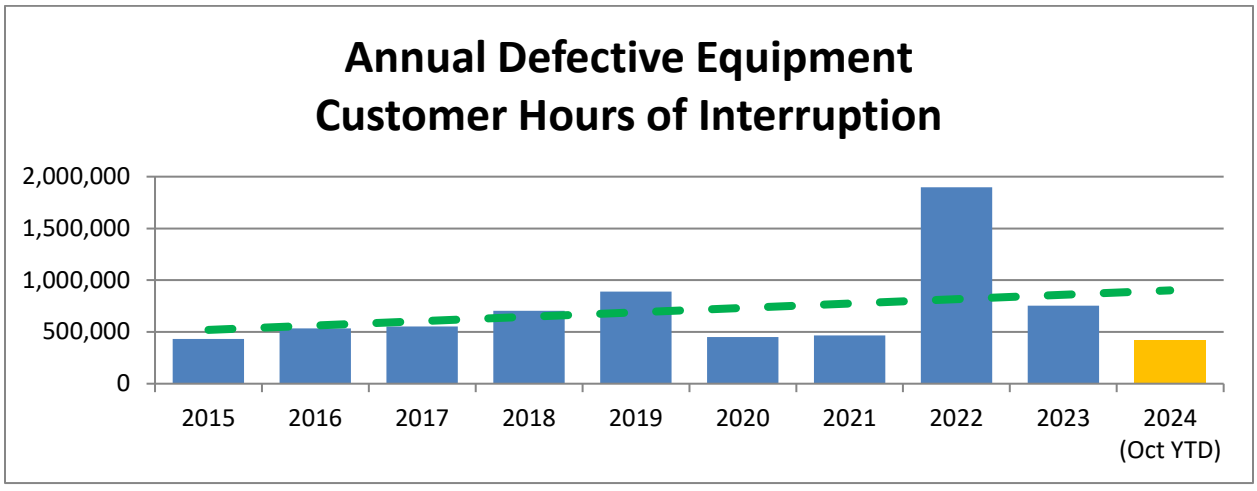


Figure 74: Annual Defective Equipment – Customer Hours of Interruption



Taking a further look into the 2024 reliability data, outages caused by equipment failure can be classified by device type. This is shown in **Figure 75** below.

Figure 75: Customer Hours of Interruption

Customer Hours of Interruption		
Device Type	**Oct 2024 YTD**	**% of Hours**
Primary Aerial Conductor	78,395	18.48%
Pin Insulator	73,519	17.33%
Tie Wire	43,251	10.20%
Recloser	34,612	8.16%
Wood Pole	31,895	7.52%
Jumper	22,316	5.26%
Cutout	21,103	4.97%
Crossarm	18,716	4.41%
Lead	13,601	3.21%
Fuse Link	13,114	3.09%

All distribution capital projects and routines that replace deteriorated equipment are aimed at sustaining or improving system reliability and contribute to the reduction of customer impacts due to device failures referenced in the table above.

Update on storm performance and related capital investments

The effect of storms and storm response varies storm-to-storm and year-to-year. The wind speeds and direction, ice, snow, lightning, rainfalls, time of year, time of day, and weather forecast accuracy all contribute to a storm's impact. NS Power anticipates that the impacts of a changing climate over the medium and long term will result in increasing weather risks for the power system that must be mitigated. Recent years have been particularly challenging in this respect. Wind gusts at or above warning levels in 2024 year to date have been below the previous 5-year average, but still higher than historical averages 2013 and prior. Furthermore, NS Power has also been challenged by non-wind related events including ice and wet snow conditions that have impacted response and customer reliability. As previously stated, NS Power SAIDI and SAIFI performance

have shown a positive trend in comparison to previous years. Targeted investments in traditional reliability-focused projects, innovative technologies, and increased forecast investment in vegetation management are designed to strengthen both grid resilience and reliability, positioning NS Power to meet the challenges of a changing climate.

NS Power uses the 2.5 Beta Method (IEEE-3366 Standard) to classify Major Event Days. The same methodology is applied to further classify Significant Event Days (2.0 Beta) and Extreme Event Days (3.5 Beta).

As of October 31, 2024, NS Power has experienced three significant event days and no major event days or extreme event days in 2024.

Consistent with prior years, NS Power has the following capital programs for storm response and reactive work for 2025:

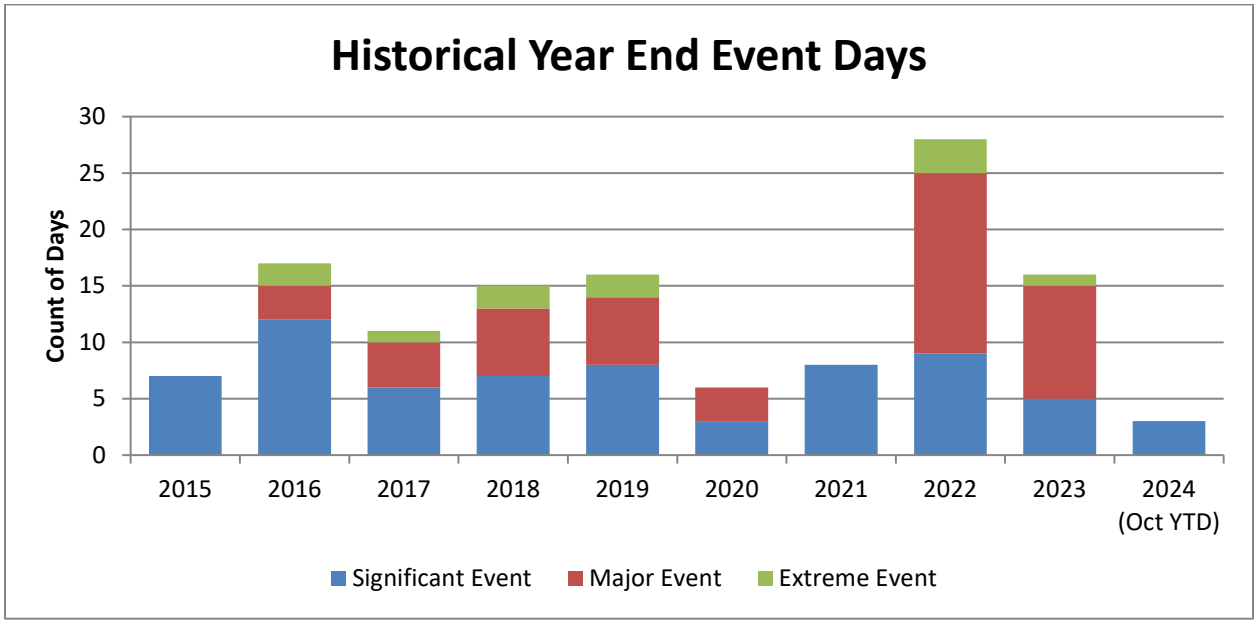
- D008 – Provincial Storm Distribution
- T001 – Transmission Line Unplanned

As noted above, NS Power continues to invest in vegetation management and works extensively with landowners and municipalities to gain permission to trim and remove trees. These investments aim to minimize tree contact and maximize access to NS Power's transmission and distribution systems as provided for in routines T010 and D010, as well as capital work order CI C0061521.

2024 Storm Performance vs. Previous Years

Figure 76 to **Figure 78** below show the count of the previously identified event day[43] classifications, and their SAIFI and SAIDI contributions annually. They outline the frequency and impact of Significant, Major, and Extreme event days[44] to customers. The graphs below illustrate the significant impact that adverse weather events have on the overall system performance.

Figure 76: Historical Year End Event Days



[43] The term "Event Day", rather than the previous term "Storm Day" is used here to refer to those events significantly exceeding normal operations, in order to better reflect that event thresholds determined using the IEEE 1633 methodology are not exclusively due to storms or other inclement weather.
[44] The term "Significant Event Day", rather than the previous term "Storm Day" is used here to reflect that event thresholds determined using the IEEE 1633 methodology, in this case the 2β threshold, are not exclusively due to storms or other inclement weather.

Figure 77: SAIFI- Event Class Contribution

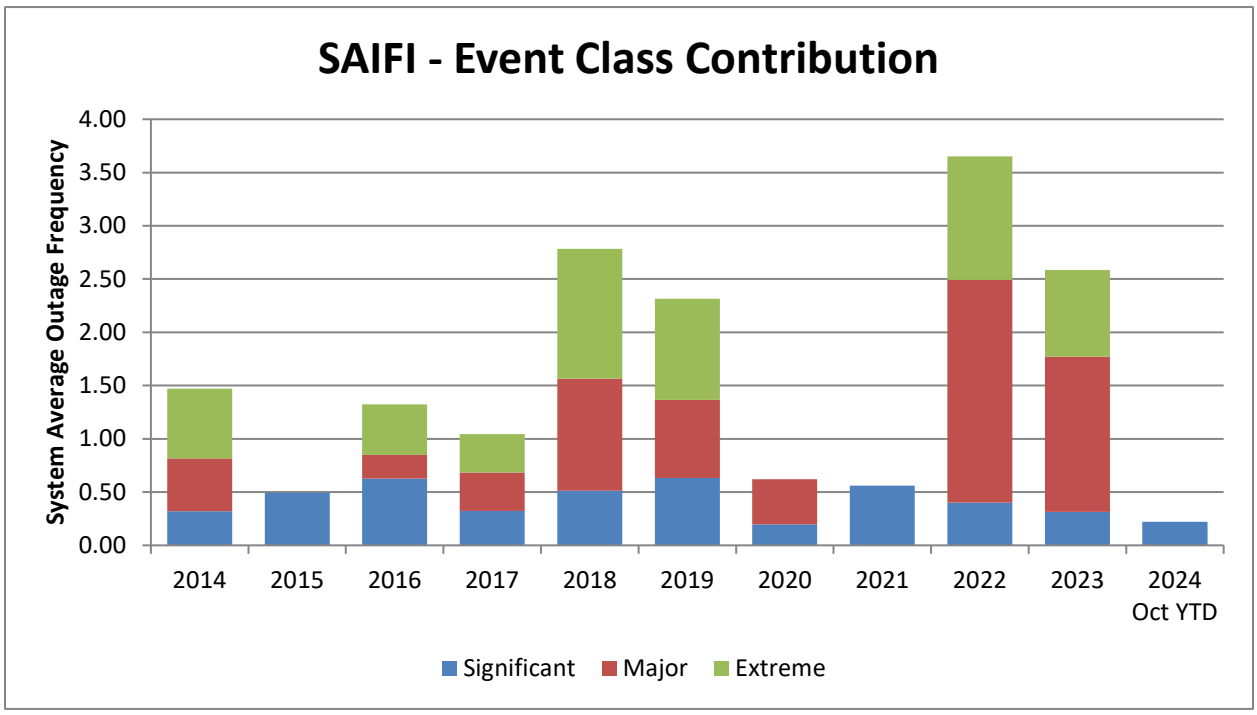


Figure 78: SAIDI – Event Class Contribution

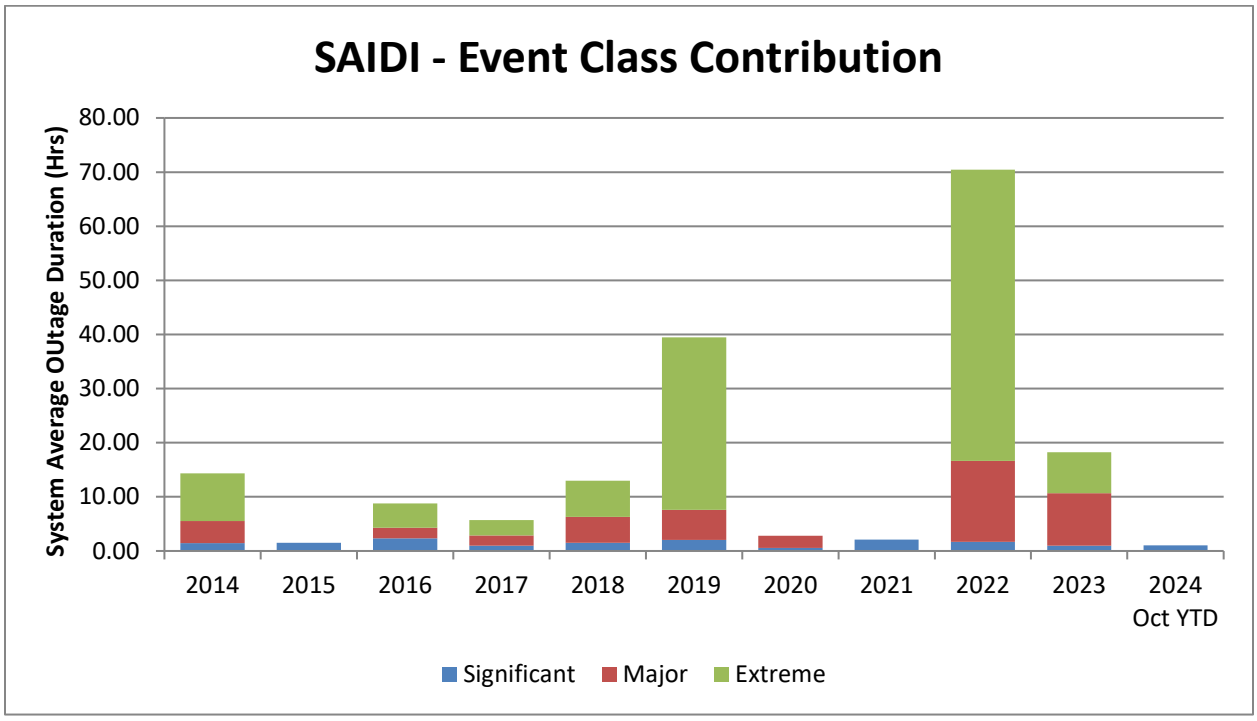


Figure 79 below provides detail on outage causes for the three event days experienced so far in 2024.

Figure 79: Detail on Outage Causes for identified Event Days

		Significant	Major	Extreme	
CEA Cause Code	**Description**	**Hours of Interruption**	**Hours of Interruption**	**Hours of Interruption**	**% of Hours**
0	Unknown/Other	1,167	0	0	3.81%
1	Scheduled Outage	89	0	0	0.05%
2	Loss of Supply	46,833	0	0	13.18%
3	Tree Contacts	183,625	0	0	30.22%
4	Lightning	0	0	0	5.05%
5	Damaged Equipment	27,907	0	0	2.87%
6	Adverse Weather	309,922	0	0	34.99%
7	Adverse Environment	0	0	0	9.68%
8	Human Element	0	0	0	0.01%
9	Foreign Interference	2,150	0	0	0.15%
	Total	**571,693**	**0**	**0**	

Over 30 percent of all identified event day outage hours in 2024 have been caused by tree contacts. Furthermore, a significant portion of events coded as adverse weather are likely related to tree contacts that may clear on their own or the tree may not be physically lying on the conductor once crews arrive. An additional portion of events coded as Loss of Supply are also related to tree contacts with transmission lines resulting in a customer outage. While NS Power always strives to minimize tree caused outages, the importance of this is further stressed in storm conditions. Continued investment in vegetation management and right-of-way widening will help minimize these outages in all weather conditions.

The following capital projects are identified to address vegetation management and right-of-way widening for 2025:

- CI C0061521 – New Distribution Rights-of-Way Phase 10
- D010 Distribution Right-of-Way Routine
- T010 Transmission Right-of-Way Routine

T010 and D010 Report

In the 2016 ACE Plan Order, the NSUARB directed as follows:

> The Board approves the 2016 Routine capital expenditures, with the exception of the Distribution ROW widening (D010) which is reduced to $600,000. The Board directs that the Routine for Transmission widening be treated as a separate project, and not a routine, in future ACE Plan Applications. NSPI is to provide an annual progress report on the expenditure, works undertaken, results achieved and future plans as part of the annual ACE Plan submissions.[45]

In accordance with the Board's directive, NS Power provides its progress report on D010 and T010 below as of October 31, 2024.

In its 2017 ACE Plan Order, the Board directed as follows:

> The Board directs NSPI to update the cost estimates for vegetation management and right-of-way widening projects in the 2018 ACE Plan (and future years) based on actual historical costs incurred for this project.[46]

NS Power confirms that the cost estimates for vegetation management and right-of-way widening projects in the 2025 ACE Plan are based on actual historical costs incurred.

Expenditures, Works Undertaken, and Results

The following progress was made on 69 kV transmission widening under C0052055:

- 90 percent of planned 2024 work has been completed as of October 31, 2024
- 100 percent completion is forecast for year end 2024
- Forecast year end spend is approximately $3,200,000

The following progress was made on >69kV transmission widening under T010:

[45] M07176, NS Power 2016 Annual Capital Expenditure Plan, NSUARB Order, June 8, 2016.
[46] M07745, NS Power 2017 Annual Capital Expenditure Plan, NSUARB Order, April 4, 2017.

- 85 percent of planned 2024 work has been completed as of October 31, 2024
- 100 percent completion is forecast for year end 2024
- Forecast year end spend is approximately $850,905
- Substitutions have been made from the original plan, due to revised priorities:
    - L-7002 and L-7009 were substituted by L-6510, L-6536, L-7005, L-8003, and L-8004

The following progress was made on distribution widening under D010:

- 37.8 percent of planned 2024 work has been completed as of October 31, 2024
- 41.2 percent completion is forecast for year end 2024
- Forecast year end spend is approximately $9,748,963

In the 2024 scope of work for D010, the actual costs of vegetation management per kilometer were higher than originally forecast. This was a combination of increases in fuel, labour, traffic control and enhancement of the scope of work for ROW widening. To further mitigate the effects of increasingly more frequent large wind events such as Fiona, NS Power began to target specific tree species, located beyond the defined ROW, that are prone to uprooting in major wind events. This activity would have been done in the past on trees that showed signs of poor health and therefore a higher likelihood of falling towards the power line. The improved approach now also assesses species type, to address certain species (such as poplar) that are more prone to uprooting during wind events. The increase in the time required to complete the additional tree removals combined with the cost increases with fuel, labor, and traffic control (compared to previous years used to create the original budget) has increased the average cost/kilometer. The result is that approximately 41.2 percent of kilometers originally targeted under D010 are ultimately expected to be completed within the 2024 ACE Plan budget amount. NS Power continues to explore opportunities to drive efficiencies in this routine and work collaboratively with its vegetation contractors to control costs.

Plans for Replacement of Aging T&D Equipment & Storm Performance

The 2015 ACE Plan Terms of Consensus included two commitments with respect to reliability:

(4) As part of the reliability directive in future ACE Plans, NS Power will provide additional information regarding its plans for replacement of aging transmission and distribution equipment in accordance with the following recommendation on this matter made by the SBA's consultant, Mary Neal, at page 12 of her evidence in this proceeding dated January 16, 2015:

> "I recommend NSPI provide more information regarding its plans for replacement of aging transmission and distribution equipment to better show how it justified the target investments. This should include (where possible):
>
> - Descriptions of assets to be replaced and their ages,
> - Goals for strategic replacement programs, such as targets for age profiles of different asset classes,
> - Expected improvements in asset age profiles due to each ACE Plan project involving replacement of transmission and distribution equipment considered at end-of-life,
> - More detailed descriptions of how NSPI targets specific assets every year, whether based on age, performance degradation, or other factors, and
> - Any recent, relevant inspection data"

(5) As part of the reliability directive in future ACE Plans, NS Power will provide an update on its storm performance and related capital investment strategies to improve storm performance.[47]

The Terms of Consensus were approved by the NSUARB on May 5, 2015. These two commitments are addressed below.

<u>Plans for Replacement of Aging Transmission and Distribution Equipment</u>

[47] M06514, NS Power 2015 Annual Capital Expenditure Plan, Terms of Consensus, February 18, 2015, page 2 of 5.

As part of its asset management practice, NS Power continually monitors outages and performance of transmission, substation and distribution assets, with future investment plans devloped at a level aimed at providing safe and reliable service, while ensuring affordability. To sustain or improve reliability performance, NS Power follows its asset management principles to prioritize investments in T&D equipment in accordance with Section 6.2 of the CEJC. The project risk rating methodology found therein and described in **Section 3.0** utilizes condition and criticality to rate projects for the replacement or refurbishment of T&D assets. This reduces the overall risk for the associated asset classes.

Annual estimated replacement ranges are developed based on asset age profiles, and the Iowa Survivor curves for equipment failure are used as a guide in understanding the overall risk for each asset class. While the investments for a specific asset class may vary from year to year depending on asset condition and system performance, the estimated replacements analysis provides a working range in which to evaluate the appropriateness of proposed sustaining capital investments.

NS Power uses a variety of factors to determine the specific assets targeted for replacement as part of the annual capital investment program. Generally, targeted assets have experienced degradation in performance manifesting in decreased reliability, increased maintenance frequency and cost, or reduced functionality. These effects are identified through reliability tracking, field inspections, and test results of the impacted assets. Criticality of the asset to continued operations of NS Power's system and risks posed to people and the environment contribute to determining specific assets for replacement.

Asset age is a concern when the frequency of required maintenance is increased, the availability of replacement parts or critical spares is limited, or performance is negatively impacted. This information can be used to inform project prioritization. However, age profiles are used in concert with asset condition, performance, and legislated requirements; it is never the single determining element in an investment decision. Capital project justifications outline the specific reasoning behind a given replacement program considering all relevant elements.

In 2014, NS Power embarked on further formalizing the identification and prioritization of T&D assets for replacement by creating a regimented framework to determine the condition, criticality, and evaluate the risks to NS Power's system imposed by individual assets within a given class. While an asset's risk rating alone does not determine its suitability for replacement, it can aid in identifying assets requiring more detailed investigation by technical experts and subsequent risk mitigation activities.

The target ranges for T&D assets covered by this analysis is provided in **Figure 80** below.

Figure 80: Age Based Replacement Ranges for T&D Assets

		High Range Replacements		Low Range Replacements	
Asset Classification	**Quantity on Grid**	**Estimated Useful Life (Years)**	**Annual Replacements**	**Estimated Useful Life (Years)**	**Annual Replacements**
Distribution Conductor (km)	44,189	45	982	55	803
Distribution Structure	373,128	50	7,463	60	6,219
Pole Top Transformer	137,734	35	3,935	45	3,061
Underground Conductor (km)	924	45	21	55	17
Padmount Transformers	4,259	35	122	45	95
Transmission Conductor (km)	5,517	55	100	65	85
Transmission Structure	32,187	55	585	65	495
Substation Breakers	455	45	10	55	8
Substation Transformer	445	50	9	60	7

Age demographics information is presently not available for all transmission and distribution asset classes. Substation transformers, substation breakers, transmission conductor, downline reclosers and padmount transformers are asset classes for which this information is currently available. As

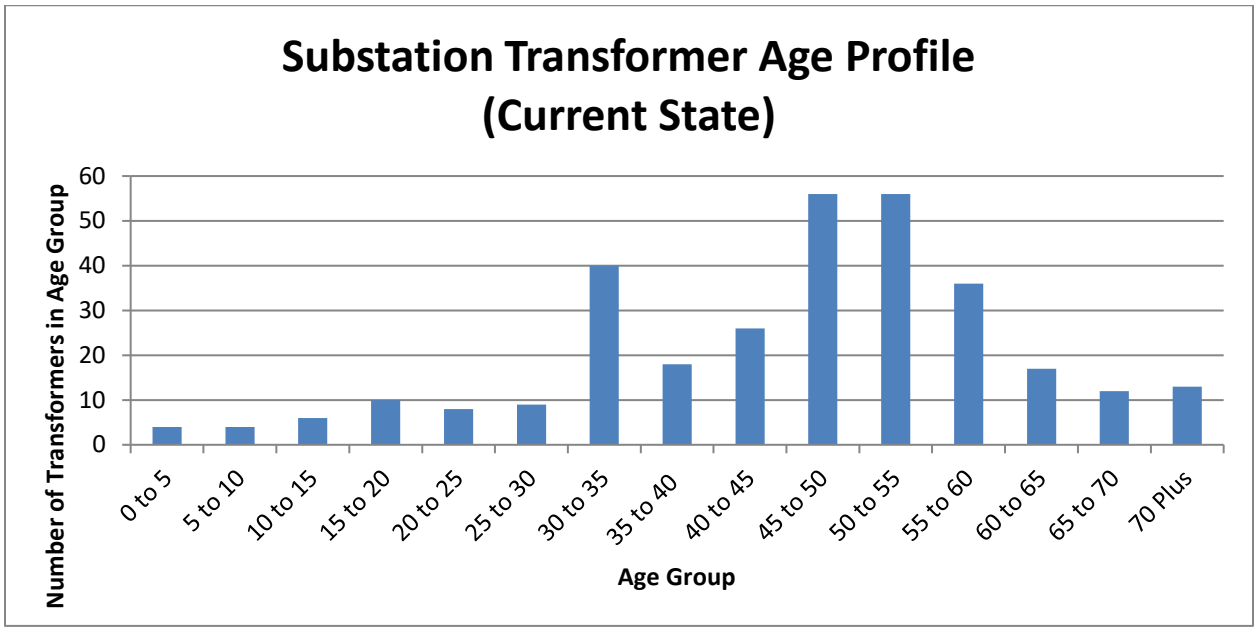
asset information improves for individual asset classes, their age profiles provide a more complete picture of the current state across the T&D system.

As T&D equipment reaches end-of-life, capital investments are used to mitigate impacts related to aging and unreliable infrastructure. It is important to recall here, and for context with the following sections (**Figure 81-Figure 90**), that age is not the only determinant of useful life and therefore an asset's reliability or risk. Older equipment may have lower risk ratings than newer equipment due to design, utilization, or other operating conditions and there continues to be advancements in technologies to enable re-validation of useful life. Therefore, in addition to age-driven identification and justification for capital replacements or upgrades, observed or calculated condition, reliability impact, and other factors are considered in determining a given asset class' capital program in any given year. The noted expected ranges of replacement per asset class per year serve as a guide or calibration range and are based on the age arithmetic. Actual replacement plans will vary depending on the assessment of the assets' conditions and priorities in the context of each year's overall plan.

Substation Transformers

Figure 81 below shows the substation transformer age profile (current state).

Figure 81: Substation Transformers Age Profile (Current State)



- Expected useful life of 50-60 years depending on the transformer type, utilization, and environmental conditions.

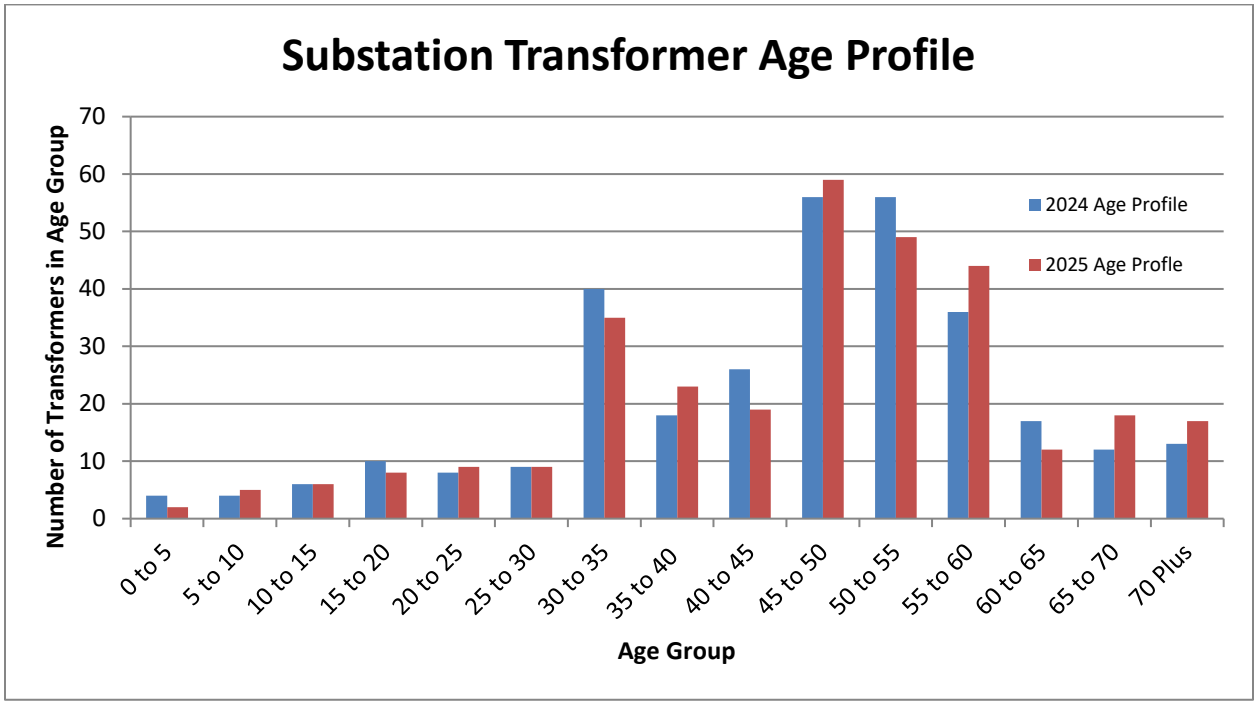
- Age Demographics – 42.5 percent of Transformers are beyond 50 years of service and 24.8 percent are beyond 60 years of service.

- Calculated range of annual replacement using the expected useful life only – 7-9 units per year.

- Changes to age demographics – As a result of the proposed 2025 capital investments in substation transformers, the age profile for this asset class will experience an increase of 1.7 percent in assets beyond 50 years of age and an increase of 4.1 percent above 60 years

of age. Age is only one of multiple factors in determining targeted assets in a given year. To support mitigation of risk associated with this asset class, continuation of the strategic transformer spares program and mobile substation program is planned. Proactive transformer replacements in future years will again focus on the overall condition of each unit and system criticality. **Figure 82** illustrates the overall change in asset age profile for Substation Transformers between 2024 and 2025.

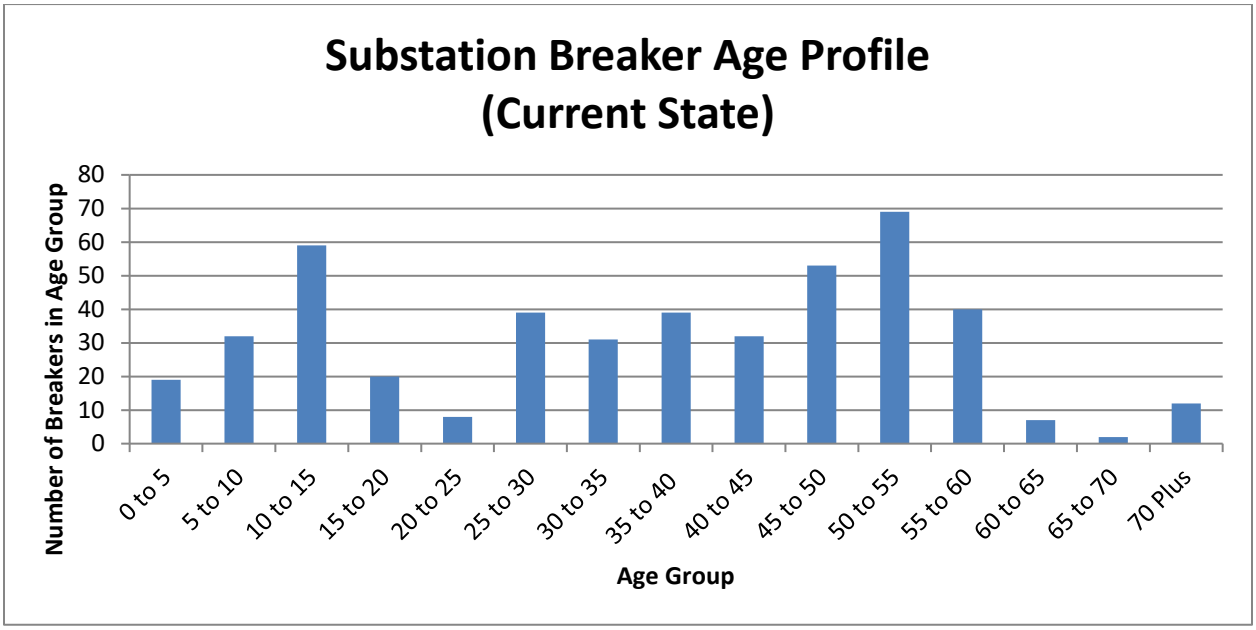
Figure 82: Substation Transformer Age Profile



Substation Breakers

Figure 83 below shows the substation breaker age profile (current state).

Figure 83: Substation Breakers Age Profile (Current State)



- Expected useful life of 45-55 years depending on the breaker type, operations count, and environmental conditions.

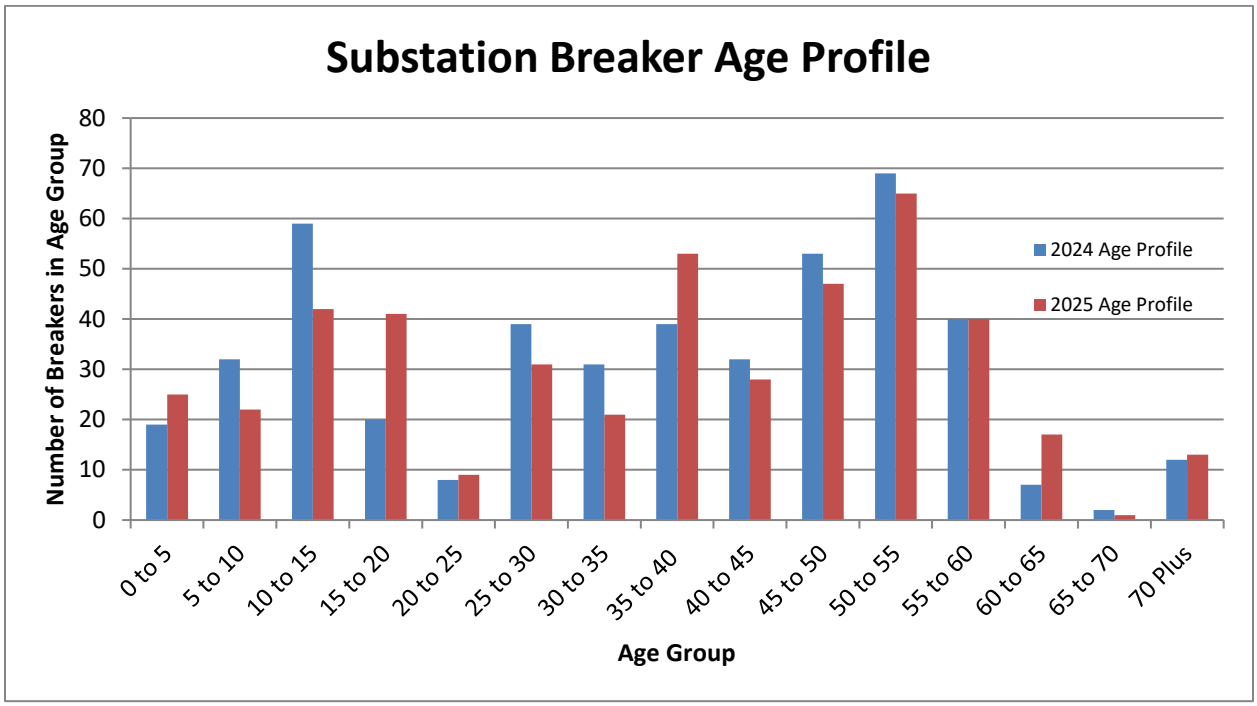
- Age Demographics – 39.6 percent of breakers are beyond 45 years of service and 13.2 percent are beyond 55 years of service.

- Calculated range of annual replacement using the expected useful life only – 8-10 units per year.

- Changes to age demographics – As a result of the proposed capital investments in Substation Breakers during 2025, the age profile for this asset class will experience a 0.6 percent decrease of assets beyond 45 years of age and 2.4 percent decrease beyond 55 years of age. Age is only one of multiple factors in determining targeted assets in a given year. To support mitigation

of risk associated with this asset class, continuation of the strategic breaker spares program is planned. **Figure 84** illustrates the overall change in asset age profile for Substation Breakers between 2024 and 2025.

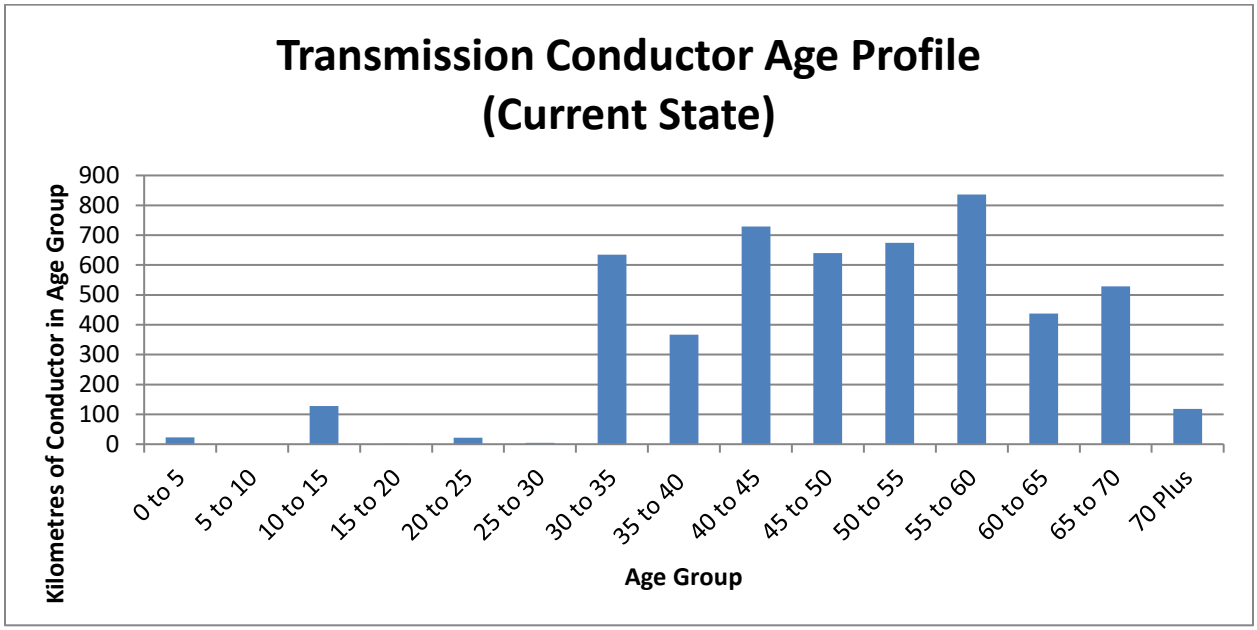
Figure 84: Substation Breaker Age Profile



Transmission Conductor

Figure 85 below shows the transmission conductor age profile (current state).

Figure 85: Transmission Conductor Age Profile (Current State)



- Expected useful life of 55-65 years depending on the conductor design and environmental conditions.

- Age Demographics – 33.7 percent of conductor is beyond 55 years of service and 13.76 percent beyond 65 years of service.

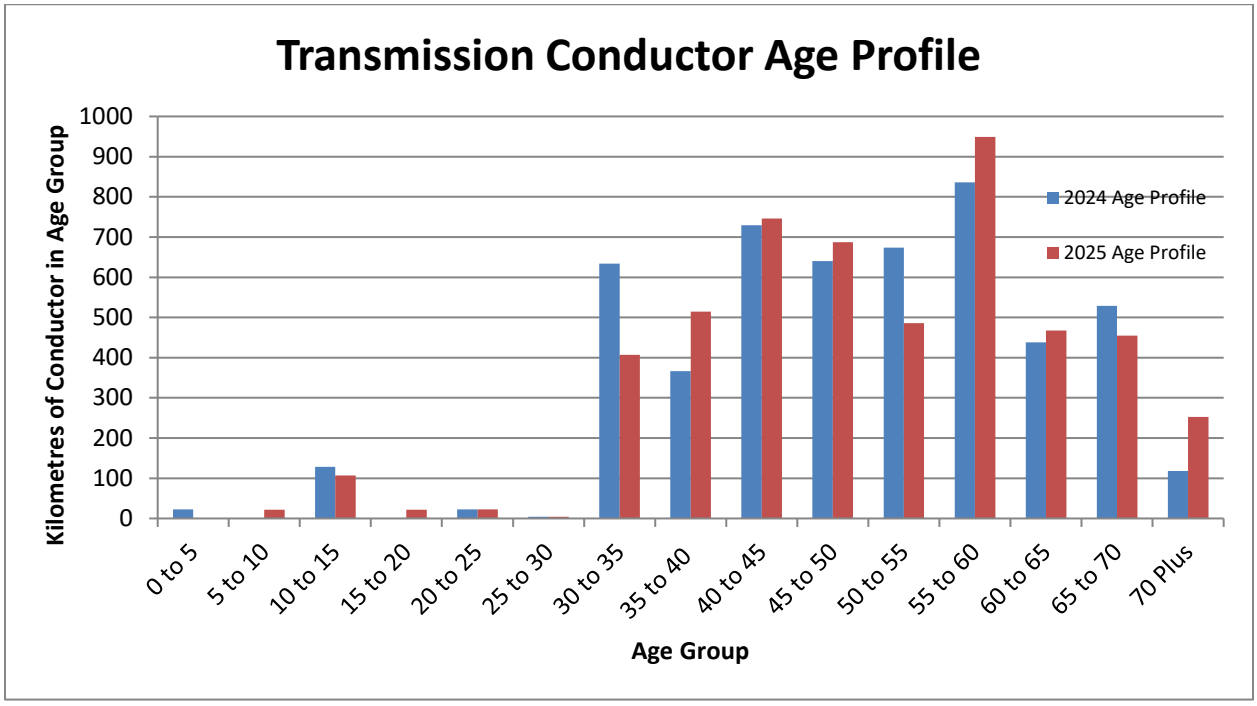
- Calculated range of annual replacement using the expected useful life only – 85 to 100 km per year.

- Changes to age demographics – As a result of proposed capital investments in transmission conductor in 2025, the age profile for this asset class will experience an approximately 4.0

percent increase in assets beyond 55 years of age and 1.28 percent increase beyond 65 years of age. Age is only one of multiple factors in determining targeted assets in a given year.

Figure 86 illustrates the overall change in asset age profile for transmission conductor between 2024 and 2025.

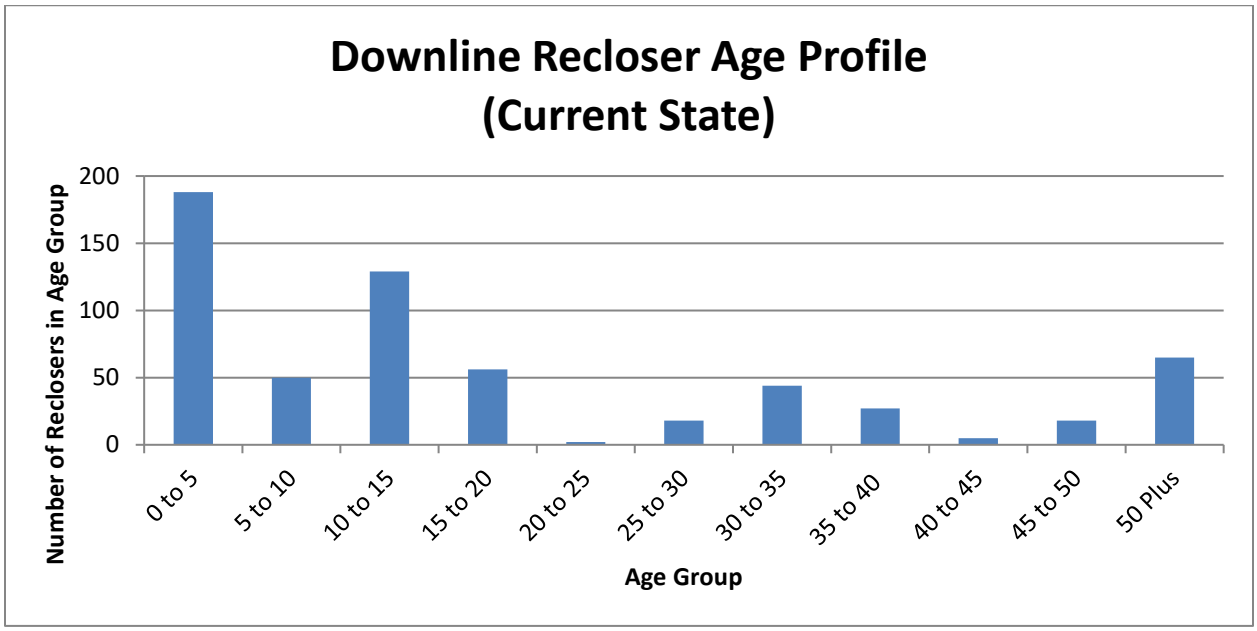
Figure 86: Transmission Conductor Age Profile



Downline Reclosers

Figure 87 below shows the downline reclosers age profile (current state).

Figure 87: Downline Reclosers Age Profile (Current State)



- Expected useful life of 30-40 years depending on the downline recloser design, loading, and environmental conditions.

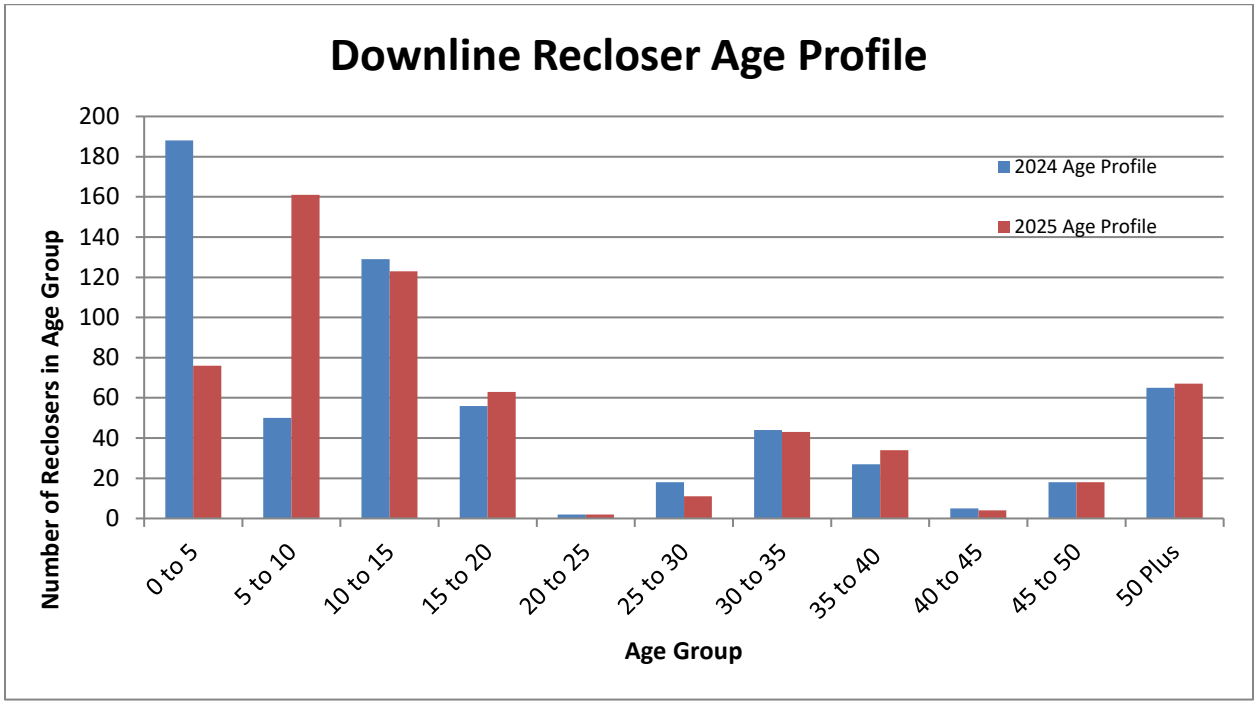
- Age Demographics – 27.6 percent of Downline Reclosers are beyond 30 years of service and 14.8 percent are beyond 40 years of service.

- Calculated range of annual replacement using the expected useful life only – 15 to 20 units per year.

- Changes to age demographics – As a result of the proposed capital investments in Downline Reclosers during 2025, the age profile for this asset class will experience an approximately 1.2 percent increase in assets beyond 30 years of age and 0.2 percent

increase beyond 40 years of age. As noted above, age is only one of multiple factors in determining targeted assets in a given year. To support mitigation of risk associated with this asset class, continuation of the strategic transformer Downline Recloser spares program is planned. **Figure 88** below illustrates the overall change in asset age profile for Downline Reclosers between 2024 and 2025.

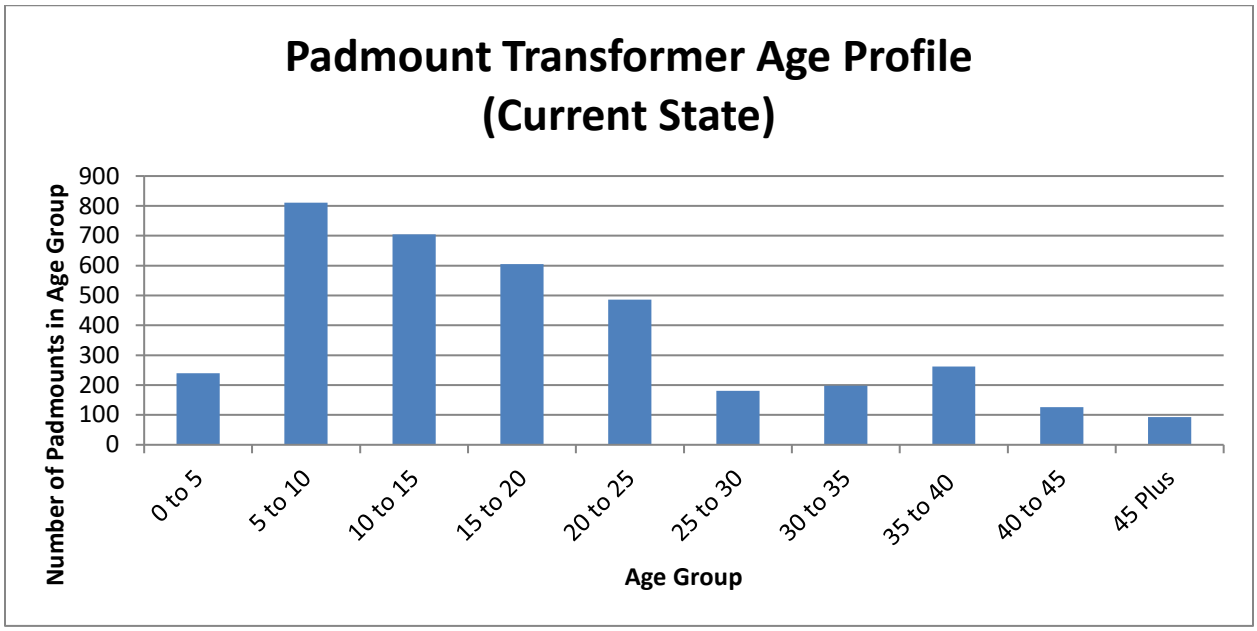
Figure 88: Downline Recloser Age Profile



Padmount Transformers

Figure 89 below shows the Padmount Transformer age profile (current state).

Figure 89: Padmount Transformers Age Profile (Current State)



- Expected useful life of 35-45 years depending on the padmount design, loading, and environmental conditions.

- Age Demographics – 13.6 percent of padmounts are beyond 35 years of service and 2.8 percent beyond 45 years of service.

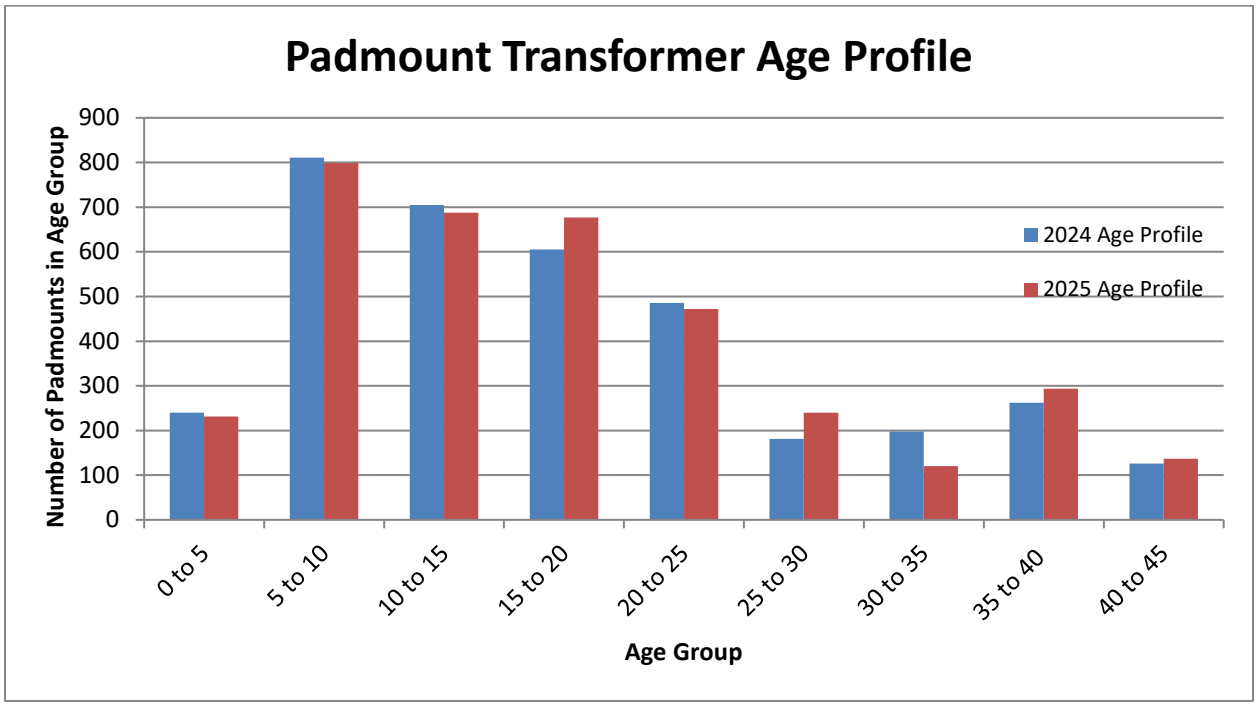
- Calculated range of annual replacement using the expected useful life only – 95 to 122 units per year.

- Changes to age demographics – As a result of the proposed capital investments in Padmount Transformers during 2025, the age profile for this asset class will experience an

approximately 0.6 percent increase in assets beyond 35 years of age and a 0.4 percent decrease beyond 45 years of age.

Figure 90 below illustrates the overall change in asset age profile for Padmount Transformers between 2024 and 2025.

Figure 90: Padmount Transformer Age Profile



11.1.6 Contingency Information

The Board's 2019 ACE Plan Decision directed NS Power to provide information related to contingency in its ACE Plan applications. The Board's most recent directive from the 2024 ACE Plan Order provided as follows:

> The Board directs NS Power to continue to track the information noted in Paragraph 92 of the Board's 2020 ACE Plan decision for each completed capital project that was submitted for Board approval in 2017, 2018, 2019, 2020, 2021, 2022, 2023 and 2024 (either through or outside of the ACE Plan proceedings, including projects submitted for subsequent approval, but excluding U&U projects). Further the Board directs that the following information be included in the related 2025 ACE Plan reporting:
>
> a) Identification of all new projects that have been added to the Contingency Report (Appendix D);
> b) A summary table of Contingency Report (Appendix D) data, similar to Figure 90 in the 2024 ACE Plan application, organized by the year projects were placed in service;
> c) A summary table of Contingency Report (Appendix D) data, similar to NS Power's response to Figure 91 in the 2024 ACE Plan application, organized by the year projects were submitted for Board approval; and
> d) For any capital projects in the Contingency Report (Appendix D) that have a negative variance greater than or equal to 25% of the Board approved capital cost estimate, NS Power is to provide an explanation detailing the reasons for the variance.
>
> The Board directs NS Power to continue to track this information, including information related to projects approved by the Board after 2024, and report it in future ACE Plan applications. The Board directs that the data continue to be presented in the 2024 ACE Plan application Appendix D format in future ACE Plan applications. This reporting is to also categorize projects by function (i.e., generation, transmission, distribution, and general plant), with "generation" projects further categorized by type of project (i.e., hydro, steam, gas, other renewables).

Please refer to **Appendix D** for the updated contingency directive file.

Please refer to **Figure 91** and **Figure 92** for a summary of the data in **Appendix D**.

Figure 91: Summary of Appendix D Data – by In-Service Year

Year	Total # of projects placed in service	Percentage of projects under-spent by greater than 20%	Percentage of projects with total spending between -20% and +30% of budget	Percentage of Projects over-spent by greater than 30%
2016	5	0%	40%	60%
2017	72	8%	63%	29%
2018	95	11%	72%	18%
2019	91	9%	82%	9%
2020	39	15%	72%	13%
2021	40	8%	78%	15%
2022	31	13%	77%	10%
2023	15	0%	100%	0%
2024	10	0%	90%	10%
All Years	398	9%	75%	16%

Figure 92: Summary of Appendix D Data – by Submission Year

Year	Total # of projects submitted for Board approval	Percentage of projects under-spent by greater than 20%	Percentage of projects with total spending between -20% and +30% of budget	Percentage of Projects over-spent by greater than 30%
2015	2	0%	50%	50%
2016	8	0%	38%	63%
2017	113	8%	66%	26%
2018	109	13%	69%	18%
2019	87	7%	85%	8%
2020	29	7%	93%	0%
2021	16	13%	88%	0%
2022	20	20%	75%	5%
2023	11	0%	91%	8%
2024	3	0%	100%	0%
All Years	398	9%	75%	16%

The data presented in **Appendix D** and summarized in the tables above indicates that the total cost for 75 percent of the projects in **Appendix D** was within the expected range of accuracy of -20 percent to +30 percent of the approved budget amounts for an AACE Class 3 estimate and that 16 percent of projects had spending more than 30 percent over their budget amounts.

While the number of projects over spent by more than 30 percent slightly exceeds what can be expected from a portfolio of projects with Class 3 estimates (10 percent of projects over-spent by 30 percent or more), the trend is continuing in a positive direction and NS Power's performance is approaching the expected range. Of the 42 projects added to this list since the 2024 ACE Plan, 37, or 88% fall within the range of -20 / +30%, with only two exceeding the 30% overspend.

NS Power continues to apply its non-binding contingency guidelines as developed in consultation with Stakeholders in the execution of its capital program. As demonstrated in **Appendix D**, the contingency applied to all projects is within the ranges set out in the non-binding contingency guidelines. On average, the amount of contingency that NS Power has applied to the projects for approval in the 2025 ACE Plan is 14 percent. This is near the lower end of the range for projects with a Class 3 estimate as detailed in the non-binding contingency guidelines.

11.2 2025 Capital Spending by Justification Criteria

Items in the 2025 ACE Plan have been developed in accordance with the CEJC. Definitions of the various criteria referenced in **Figure 93** below are included in the CEJC.

Figure 93: Capital Expenditures by Justification Criteria
(Millions of dollars)

Justification Criteria	2025 Budget	Projects included for Approval	Routine Spend	Less than $1M	2024 ACE Items for Filing in late 2024	Items for Subsequent Submission	Carryover	Pt. Aconi
Health & Safety	38.3	-	0.7	4.3	-	2.1	30.8	0.4
Environment	13.9	8.6	0.8	2.1	1.2	-	1.3	-
Land and Right-of-Way	0.1	-	0.1	-	-	-	-	-
Hydro, Wind and Biomass	36.2	2.2	3.9	5.4	-	3.2	21.5	-
Thermal	112.5	4.9	3.3	53.6	-	13.2	18.8	18.7
Transmission Plant	250.5	15.5	18.0	1.0	-	60.3	155.7	-
Distribution System	171.8	6.6	131.3	8.4	-	1.6	24.0	-
Pole Retreatment	0.1	-	-	-	-	-	0.1	-
Metering Equipment	5.6	-	4.9	-	-	-	0.7	-
Work Support Facilities	15.7	3.2	8.3	1.1	-	3.1	0.1	-
Information Technology Application and Hardware System	28.5	-	4.3	2.4	-	12.6	9.3	-
Vehicles	19.2	-	19.2	-	-	-	-	-
Total	**$692.4**	**$41.0**	**$194.6**	**$78.1**	**$1.2**	**$96.1**	**$262.3**	**$19.1**

*Note: Details of justification sub-criteria are provided in the following section.

Note: Figures presented may include $0.1M in rounding differences on some line items.

11.3 2025 Capital Spending by Justification Sub-Criteria

Figure 94 below provides 2025 capital spending by justification sub-criteria.

Figure 94: 2025 Capital Spending by Justification Sub-Criteria
(Millions of dollars)

Justification Sub-Criteria	2025 Budget	Projects included for Approval	Routine Spend	Less than $1M	2024 ACE Items for Filing in late 2024	Items for Subsequent Submission	Carryover
Distribution System							
Requirement to Serve	$116.1	$-	$114.2	$-	$-	$-	$1.9
Pole Strength	1.0	-	-	-	-	-	1.0
Service Voltage	2.5	-	-	0.3	-	-	2.2
Deteriorated Conductor	1.3	-	-	-	-	-	1.3
Outage Performance	29.8	-	12.5	0.7	-	-	16.6
Joint Use Agreement	4.6	-	4.6	-	-	-	-
Other Distribution System	16.5	6.6	-	7.4	-	1.6	0.9
Total	**$171.8**	**$6.6**	**$131.3**	**$8.4**	**$-**	**$1.6**	**$24.0**
Work Support Facilities							
Building Facilities/Furniture	$6.7	$-	$5.0	$-	$-	$1.6	$0.2
Telecontrol & Telecommunications	6.2	3.2	1.4	0.2	-	-	1.4
Other Work Support Facilities	2.8	-	1.9	0.8	-	1.5	(1.5)
Total	**$15.7**	**$3.2**	**$8.3**	**$1.1**	**$-**	**$3.1**	**$0.1**

Note: Figures presented may include $0.1M in rounding differences on some line items

11.4 Quick Reference Sheet

2024 AFUDC Rate for Capital 6.72%

In the Board's Weighted Average Cost of Capital (WACC) and Allowance for Funds Used During Construction (AFUDC) Order dated April 3, 2024, the NSUARB directed NS Power as follows:

1. The WACC and AFUDC rates are established at 6.72%, effective April 1, 2024. [48]

Consistent with the Board's Order, the 2025 ACE Plan projects use the Board's approved AFUDC rate of 6.72 percent.

2025 O/H Rates

Generation		**Customer Operations**		**Shared Services**	
PP Regular	37.55%	Regular	56.63%	IT	56.46%
Hydro	93.89%	Contract	14.46%		
Contract	12.38%	Vehicle	49.89%		

[48] M11563, NS Power WACC/AFUDC Application, NSUARB Order, April 3, 2024.

11.5 2025 Depreciation Rates

Figure 95: 2025 Depreciation Rates

	2025
Steam Production Plant	
Lingan	
Lingan 1-2	4.12%
Lingan 3-4	2.28%
Lingan – Common	4.48%
Total Lingan	3.35%
Point Aconi 1	2.27%
Point Tupper	
Point Tupper 1 (Common)	3.97%
Point Tupper 2	2.82%
Total Point Tupper	2.89%
Trenton	
Trenton 5	3.10%
Trenton 6	2.34%
Trenton – Common	0.47%
Total Trenton	2.47%
Tufts Cove	
Tufts Cove 1	4.24%
Tufts Cove 2	3.68%
Tufts Cove 3	2.33%
Tufts Cove – Common	3.44%
Total Tufts Cove	3.27%
Port Hawkesbury Biomass	2.50%
Point Tupper Marine Terminal	4.06%
International Coal Pier	2.60%
General	2.82%
Total Steam Production Plant	**2.82%**

Figure 95: 2025 Depreciation Rates

	2025
Hydro Production Plant	
Avon	3.02%
Bear River	1.80%
Black River	2.04%
Dickie Brook	3.16%
Fall River	1.82%
Harmony	4.55%
Lequille System	2.33%
Roseway	2.29%
Mersey	2.00%
St. Margaret's	2.85%
Sheet Harbour	3.38%
Tusket	2.64%
Wreck Cove System	1.67%
Annapolis Tidal	2.32%
General	2.10%
Total Hydro Production	**2.10%**

	2025
Other Production - Combustion Turbines	
Burnside	2.40%
Tusket	6.42%
Victoria Junction	3.17%
Tufts Cove Unit 4	2.55%
Tufts Cove Unit 5	2.77%
Tufts Cove Unit 6	3.03%
Wind Turbines	
Pre 2009 Wind	5.52%
Post 2009 Wind	4.00%

Figure 95: 2025 Depreciation Rates

Transmission Plant	
Land Rights - Easements	1.26%
Station Equipment	2.14%
Towers & Fixtures	1.26%
Poles & Fixtures	4.32%
Overhead Conductors & Devices	1.96%
Underground Conduit	1.53%
Underground Conductors & Devices	2.61%
Roads, Trails & Bridges	1.74%
Total Transmission Plant	**2.35%**

	2025
Distribution Plant	
Land Rights - Easements, Surveys & Clearing	1.56%
Structures & Improvements	5.31%
Station Equipment	1.28%
SCADA Equipment	9.68%
Remote Monitoring Equipment	10.32%
Station Equipment – Miscellaneous	12.49%
Poles, Towers & Fixtures	3.79%
Overhead Conductors & Devices	3.33%
Underground Conduit	1.51%
Underground Conductors & Devices	3.17%
Line Transformers	4.09%
Services	5.33%
Meters	6.87%
Street Lighting & Signal Systems	5.33%
Total Distribution Plant	**3.89%**

	2025
General Plant	
Land Rights - General Plant	1.93%
Structures & improvements	2.85%
Office Furniture & Equipment	9.26%
Office Furniture & Equip - Comp Hardware	20.00%
Office Furniture & Equip - Comp Software	10.00%
Transportation Equipment	9.55%
Stores Equipment	14.97%
Communication Equipment	4.38%
Communication Equipment - SCADA Eq	1.33%

Figure 95: 2025 Depreciation Rates

Remote Monitoring Equipment	10.27%
Miscellaneous Equipment	5.02%
Roads, Bridges & Trails (Kelly Rock)	2.58%
Mining Equipment (Kelly Rock)	2.92%
Total General Plant	**8.16%**

	2025
Smart Grid Project	
Solar Generation	4.00%
Batteries	10.00%
EV Chargers	6.67%

	2025
Battery Energy Storage System (BESS) Project	
Battery Storage Systems	5.00%

1

CI Number: C0048990

Title: HYD AVO 2 Switchgear Replacement

Start Date: 2022/09
In-Service Date: 2025/12
Final Cost Date: 2026/06
Function: Hydro
Forecast Amount: $1,814,631

DESCRIPTION:

This project will replace the existing switchgear with modern safety improved arc-flash rated switchgear, integrating with modern controls and interfaces.

The Avon 2 Generating Station is part of the Avon Hydro System and is a single powerhouse with one unit. The plant generates, on average, 9.39 GWh of renewable electricity annually.

Summary of Related CIs +/- 2 years
Pursuant to Section 11.2 of the CEJC, related CIs for Hydro projects include "work completed on the same generating unit and dam structures, but not necessarily the same asset."

- 2025 CI 49036 HYD AVO 2 Controls Upgrade $496,293
- 2025 CI C0058062 HYD AVO 2 Station Service Upgrade $335,271

Depreciation Class: Hydraulic Production Plant - Avon Hydro System

Estimated Life of the Asset: 35 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 4.5%

JUSTIFICATION:

Justification Criteria: Health & Safety

Why do this project?

The current switchgear in the Avon 2 plant is 32 years old (installed in 1993) and does not meet current arc flash safety standards. An Arc Flash Assessment was completed on this plant in 2020 to determine the amount of energy released during an arc-fault. The Avon 2 Switchgear was noted as having a Category 4 Energy Level, the highest level within Standard NFPA 70 The National Electrical Code. The switchgear breakers require major refurbishment and other components within the switchgear are also in poor condition and require replacement.

The existing switchgear is not arc flash resistant. Given the condition of the equipment, replacing the switchgear will reduce the arc flash hazard to employees as well as improve the safety and reliability of the unit breakers by replacing with new components.

Why do this project now?

The switchgear in the Avon 2 plant is 32 years old and has reached the end of its expected design life. The design of the breakers presents an arc-flash risk with every manual racking operation. The switchgear breakers, and other components of the switchgear, are in poor condition and require replacement.

Why do this project this way?

Replacing the switchgear is required to bring the equipment up to modern safety standards. Replacing the switchgear will provide added protection to employees even when covers of the switchgear are closed and latched. Due to the age of the switchgear, this long-term solution is the option chosen to increase employee safety and plant reliability.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment and previous experience with hydro switchgear replacement projects (C0036368 HYD Lower Great Brook Switchgear Replacement and C0024484 HYD Fourth Lake Switchgear Replacement), and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a AACE Class 3 estimate with a contingency value appropriate to that range. NS Power has selected a 20 percent contingency for this project to account for specific risks including market volatility for contracted installation/commissioning, and additional refurbishments/replacements that may be required but not able to be assessed until after removal of the current asset such as additional site prep, cabling and relay replacements.

CI Number : C0048990 - HYD AVO 2 Switchgear Replacement

Project Number C0048990

Parent CI Number : -

Asset Location : 1350 - 1350 Avon 2, 3 Mwh; 1928

Budget Version Working Budget Version

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	2200 - HGP - Elec Contr.Equip.	1,687,209
Retirements	2200 - HGP - Elec Contr.Equip.	127,422
	Total Cost:	1,814,631
	Original Cost:	895,743

Capital Project Detailed Estimate

Location: Hydro
CI#: C0048990
Title: HYD Avon 2 Switchgear Replacement
Execution Year: 2022-2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Hydro River Staff - Construction	PD	104	437	$ 45,574		
Engineering Staff	PD	135	472	$ 63,720		
Hydro River Staff - Removal	PD	48	437	$ 21,184		
			Sub-Total	$ 130,478		
Term Labour						
Hydro River Staff - Construction	PD	32	437	$ 14,054		
				$ -		
			Sub-Total	$ 14,054		
Travel Expenses						
Site Visits	Lot	1	$ 4,500	$ 4,500		
Travel for Factory Acceptance Test	Lot	1	$ 4,000	$ 4,000		
			Sub-Total	$ 8,500		
Materials						
Arc Resistant Switchgear Procurement	Lot	1	[redacted]			
Motorized Racking System	Lot	1				
Cables	Lot	1				
Misc. Materials	Lot	1	$ 20,000	$ 20,000		
Arc Chute Wall Assembly	Lot	1	[redacted]			
Plenum Extension	Lot	1				
				$ -		
				$ -		
			Sub-Total	[redacted]		
Contracts						
Switchgear Install	Lot	1	[redacted]			C0024484
Site Supervision	Lot	1				
Misc Contracts	Lot	1	$ 17,000	$ 17,000		
				$ -		
			Sub-Total	[redacted]		
Freight Postage Delivery						
Switchgear Freight	Lot	1	[redacted]			
			Sub-Total	[redacted]		
Consulting						
Switchgear Specification	Lot	1	[redacted]			
Arc Flash Assessment	Lot	1				
Misc. Consulting	Lot	1	$ 3,141	$ 3,141		
HMI / PLC Programming	Lot	1	$ 10,000	$ 10,000		
			Sub-Total	$ 72,322		
Meals and Entertainment						
Meals	Lot	1	$ 400	$ 400		
			Sub-Total	$ 400		
Rental/Maintenance of Equipment						
Trailer/washroom rentals	Lot	1	$ 11,700	$ 11,700		
			Sub-Total	$ 11,700		
Other Goods and Services						
Contingency	%	20%	$ 1,306,288	$ 261,258		
			Sub-Total	$ 261,258		
Interest Capitalized						
AFUDC				$ 62,626		
				$ -		
			Sub-Total	$ 62,626		
Administrative Overhead						
Administrative Overhead				$ 127,231		
Contractor Admin Overhead				$ 57,229		
			Sub-Total	$ 184,460		
			Sub-Total (no AO, AFUDC)	$ 1,567,545		
			TOTAL (AO, AFUDC included)	$ 1,814,631		
Original Cost				$ 895,743		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix						
Hydropower	**Required fields:**	**Estimate Classification**				
Project Name: HYD Avon 2 Switchgear Replacement	**Started or Preliminary**	**Class 5**	**Class 4**	**Class 3**	**Class 2**	**Class 1**
Maturity Level of Project Definition Deliverables	**Defined or Complete**	**0% to 2%**	**1% to 15%**	**10% to 40%**	**30% to 75%**	**65% to 100%**
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Facility Output / Production Profile	Not Applicable (NA)					
Electrical Power Requirements (when not the primary capacity driver)	Not Applicable (NA)	NR				
C. Project Location						
Plant and Associated Facilities	Not Applicable (NA)					
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Communication Systems	Defined (D)	NR	P	D	D	D
Fire Protection and Life Safety	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Not Applicable (NA)	NR	NR			
E. Technology Selection						
Not Applicable						
F. Strategy						
Contracting/Sourcing	Preliminary (P)	NR	P			
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
Regulatory Approval & Permitting	Defined (D)	P	P	D	D	D
Material Utilization (Borrow Sources)	Not Applicable (NA)					
Logistics Plan	Preliminary (P)	P	P	P		
Work Breakdown Structure (WBS)	Preliminary (P)	P	P	P/D		
Decommissioning/Demolition Plan	Preliminary (P)	NR	P			
Integrated Project Plan	Preliminary (P)	NR	P			
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Risk Register	Preliminary (P)	NR	P			
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
H. Studies						
Hydraulics	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Geotechnical Investigation	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Block Flow Diagrams	Not Applicable (NA)					
Hydraulic Design & Probable Maximum Flood (PMF)	Not Applicable (NA)					
Equipment Data Sheets	Complete (C)	NR/S	P	C	C	C
Equipment Lists: Electrical	Preliminary (P)	NR/S	P			
Equipment Lists: Process/Utility/Mechanical	Preliminary (P)	NR/S	P			
Design Specifications	Complete (C)	NR	S/P	C	C	C
Electrical One-Line Drawings	Started (S)	NR	S/P			
General Equipment Arrangement Drawings	Preliminary (P)	NR	S/P			
Instrument List	Preliminary (P)	NR	S/P			
Construction Permits	Not Applicable (NA)	NR				
Civil/Site/Structural/Architectural Discipline Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Started (S)	NR	S/P			
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Fire Protection & Life Safety Drawings & Details	Complete (C)	NR	S/P	P	C	C
Mitigation Measures (Aquatic, Terrestrial, Heritage, etc.)	Not Applicable (NA)	NR				
Dam Design & Drawings	Not Applicable (NA)	NR				
De-silting Basins	Not Applicable (NA)	NR				
Gates & Cranes Design & Drawings	Not Applicable (NA)	NR				
Intake Design & Drawings	Not Applicable (NA)	NR				
Penstock Design & Drawings	Not Applicable (NA)	NR				
Power House Design & Drawings	Not Applicable (NA)	NR				
Spillway Design & Drawings	Not Applicable (NA)	NR				
Turbine and Generator Design & Drawings	Not Applicable (NA)	NR				
Electrical Schedules	Started (S)	NR	NR/S			
Instrument & Control Schedules	Preliminary (P)	NR	NR/S	P	P/C	
Instrument Data Sheets	Started (S)	NR	NR/S			
Spare Parts Listings	Preliminary (P)	NR	NR	P	P/C	
Electrical Discipline Drawings	Started (S)	NR	NR	S/P		
Facility Emergency Communication Plan & Drawings	Preliminary (P)	NR	NR	S/P	P/C	
Information Systems/Telectommunication Drawings	Preliminary (P)	NR	NR	S/P	P/C	
Instrumentation/Control System Discipline Drawings	Started (S)	NR	NR	S/P		
Mechanical Discipline Drawings	Not Applicable (NA)	NR	NR			
Auxiliary Electrical Design & Drawings	Started (S)	NR	NR	S		
Auxiliary Mechanical Design & Drawings	Not Applicable (NA)	NR	NR			
Protection & Controls System Design & Drawings	Complete (C)	NR	NR	S	P	C
	Total # Deliverables for this Project	4	25	22	16	12
	% Defined/Complete towards Class Estimate	100%	100%	63%	46%	34%

Comments:

This project is being submitted as an AACE Class 3 estimate. The deliverables of this project indicate that 63% of the Class 3 deliverables have been completed. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. NS Power has selected a 20% contingency to account for specific risks, including market/pricing volatility of contractor installation, and any timing delays required for commissioning both for internal and external technical support. Given the age of the asset/auxiliary components such as cables, connections, panels, and supporting structures, contingency could also be required for these auxiliary refurbishments/replacements that may be required based on the as-found condition, once isolation has taken place. Many of these components are not able to be safely assessed until decommisioning begins.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions

For the purposes of this document, the term *hydropower industries* is assumed to include private and public utilities involved with the production of electrical power, exclusive of transmission and distribution, using natural gravitational force of falling or flowing water, excluding tidal forces, to drive a turbine that powers a generator.

The common thread among private and public utilities (for the purpose of estimate classification) is their reliance on user requirements, statement of objectives, design reports (i.e. geotechnical investigations, sourcing borrow materials and hydraulic design/modeling) and/or environmental data collection and studies as primary scope defining documents. These documents are key deliverables in determining the degree of project definition, and thus the extent and maturity of estimate input information.

Cost estimates for hydropower facilities are typically composed of key features such as:

- Reservoir area preparation (e.g., clearing, removal of structures and earthmoving).
- River management (e.g., cofferdams, diversion channels or tunnels, sediment management plans, environmental monitoring programs).
- Principal structures (e.g., dams, dykes, intakes, penstocks, powerhouse(s), low level outlet(s), power tunnel(s), de-silting basin(s), and spillway structure(s)).
- Permanent infrastructure (e.g., access roads, railroads, bridges, offices, warehouse and housing).
- Temporary infrastructure (e.g., construction camp, site access roads, airport, workshops, construction power etc).
- Environmental mitigation features (e.g. fish ladder(s), water bypass and creation of new fish or wildlife habitat).
- Owner's costs (e.g., stakeholder involvement, licensing, studies and investigations, administration and overhead, catering.).

Some, but not all, of these features are unique to the hydropower industries.

Typical hydropower facilities may include: turbines, generators, exciters, governors, transformers, gates for intake, spillway and draft tubes, and supporting electrical, mechanical, telecom, protection, and control systems. The water storage reservoir is typically required to support the operations of the hydropower facility.

CI Number: C0039266

Title: HYD Gulch Overhaul

Start Date: 2022/07
In-Service Date: 2026/06
Final Cost Date: 2026/12
Function: Hydro
Forecast Amount: $1,371,379

DESCRIPTION:

This project includes the refurbishment of the Gulch Hydro Unit. The scope includes refurbishment of the turbine, headcover, scroll case as well as all wear items, replacement of protective coatings, and refurbishment or replacement of damaged components. Grease bushings will be replaced with water lubricated modern materials where possible. This unit was last overhauled in 2000.

The Gulch Hydro Station is located on the Bear River System and has been in service since 1952. Gulch Unit is rated at 7.5 MW and produces approximately 27 GWh/year.

Summary of Related CIs +/- 2 years
Pursuant to Section 11.2 of the Detailed CEJC, related CIs for hydro projects includes "work completed on the same generating unit and dam structures, but not necessarily the same asset."

- 2024 CI C0049974 Gulch Crane Upgrades $111,576
- 2025 CI C0049192 Gulch Generator Refurbishment $732,043

Depreciation Class: Hydraulic Production Plant – Bear River Hydro System

Estimated Life of the Asset: 25 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 1.2%

JUSTIFICATION:

Justification Criteria: Hydro, Wind & Biomass

Why do this project?

Internal condition assessments were completed in 2017 and 2022 at which time operating mechanisms (wicket gate links and pins) were found to have excessive clearances and prioritized this unit for refurbishment. Many components (thrust pot seal, lower guide piping, gate stems) are leaking oil. Steel components are corroding and require protective coatings to prevent further corrosion. Since 2017, bi-annual mechanical inspections have been completed to monitor changes and minor refurbishments to the unit have been completed to address bearings and oil release while other overhauls have been higher priority; however, long term refurbishment is now required to ensure reliability at Gulch. This unit is relied on for both power and voltage supply in that part of the province. Unplanned failure of the unit would result in longer outage time/replacement energy costs for unplanned work in addition to potential asset damage if ran to failure.

Why do this project now?

The last overhaul was completed in 2000. Minor refurbishments have been completed since the last inspections but longer term refurbishments are now required. In order to mitigate the risk of an unplanned outage, this work should be completed in 2025.

Why do this project this way?

Refurbishing this unit is the most economical way to maintain reliability. Replacement of specific worn components under an overall refurbishment is significantly more economic than a full unit replacement. To maximize output of the unit, the refurbishment will be timed to minimize spilled water (lost generation) by having work completed and unit available for generation in Spring 2026.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment and previous experience with hydro unit overhaul projects, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a AACE Class 3 estimate with a contingency value appropriate to that range. Previous hydro overhauls have utilized 20-30 percent contingency on all estimated costs; due to the projects being similar, a 20 percent contingency has been applied. Contingency is intended to account for water management risks associated with the isolation of the unit to ensure work space is dry, and additional component refurbishments that may be required based on the as-found condition following isolation and unit disassembly, as there are components that are not accessible for assessment/inspection until after unit disassembly. Additional overtime work may also be required to complete the project within the outage window, so as to be available for generation in Spring 2026. Contingency may also be required for any unforeseen material or contract cost increases.

CI Number : C0039266 - HYD - Gulch Overhaul

Project Number C0039266

Parent CI Number : -

Asset Location : 1351 - 1351 Bear River Gulch, 8 Mwh; 1952

Budget Version 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	2500 - HGP - Generator	1,253,370
Retirements	2500 - HGP - Generator	118,009
	Total Cost:	1,371,379
	Original Cost:	745,980

Location: Hydro
CI#: C0039266
Title: HYD Gulch Overhaul
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Hydro River Staff - Construction	PD	529	$ 437	$ 231,010		
Engineering Staff	PD	120	$ 472	$ 56,640		
Hydro River Staff - Removal	PD	134	$ 437	$ 58,580		
			Sub-Total	$ 346,230		
Overtime Labour						
Hydro River Staff	PD	17	$ 874	$ 15,043		
				$ -		
			Sub-Total	$ 15,043		
Term Labour						
Hydro River Staff - Construction	PD	147	$ 372	$ 54,758		
				$ -		
			Sub-Total	$ 54,758		
Travel Expenses						
Travel	lot	1	$ 7,956	$ 7,956		
Accomodations	lot	1	$ 33,000	$ 33,000		
			Sub-Total	$ 40,956		
Materials						
Turbine parts refurb	lot	1	$ 81,196	$ 81,196		C0053655
Runner shaft	lot	1	$ 10,000	$ 10,000		
Vacuum line	lot	1	$ 10,000	$ 10,000		
CIP for bushings, etc.	lot	1	$ 6,727	$ 6,727		C0053655
Creep Sensor	lot	1	$ 8,000	$ 8,000		
Lignum Vitae blocks (turbine bearing)	lot	4	$ 7,399	$ 29,595		C0038126
Misc. Materials	lot	1	$ 5,000	$ 5,000		
				$ -		
			Sub-Total	$ 150,518		
Contracts						
Draft tube concrete refurb	lot	1	$ 10,000	$ 10,000		
Throat ring refurb	lot	1	$ 10,000	$ 10,000		
Inspections (Lifting Devices, bearings, Valves, scroll case)	lot	1	$ 20,000	$ 20,000		
Scroll Case refurb (sandblast and paint)	lot	1	$ 43,198	$ 43,198		52262
				$ -		
			Sub-Total	$ 83,198		
Consulting						
Component Engineering/ Drawings	lot	1	$ 50,000	$ 50,000		
Draft Tube Platform design	lot	1	$ 20,000	$ 20,000		
Hazmat testing	lot	1	$ 4,000	$ 4,000		
				$ -		
			Sub-Total	$ 74,000		
Meals						
Travel Meals for Overhaul Crew	lot	1	$ 7,757	$ 7,757		
				$ -		
			Sub-Total	$ 7,757		
Other Goods and Services						
Contingency	%	20%	$ 772,461	$ 154,492		
			Sub-Total	$ 154,492		
Interest Capitalized						
AFUDC				$ 57,281		
				$ -		
			Sub-Total	$ 57,281		
Administrative Overhead						
Administrative Overhead				$ 376,845		
Contractor Admin Overhead				$ 10,301		
			Sub-Total	$ 387,146		
			Sub-Total (no AO, AFUDC)	$ 926,953		
			TOTAL (AO, AFUDC included)	$ 1,371,379		
Original Cost				$ 745,980		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix						
Hydropower	**Required fields:**	**Estimate Classification**				
Project Name: HYD Gulch Overhaul	**Started or Preliminary**	**Class 5**	**Class 4**	**Class 3**	**Class 2**	**Class 1**
Maturity Level of Project Definition Deliverables	**Defined or Complete**	**0% to 2%**	**1% to 15%**	**10% to 40%**	**30% to 75%**	**65% to 100%**
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Facility Output / Production Profile	Defined (D)	P	P	D	D	D
Electrical Power Requirements (when not the primary capacity driver)	Defined (D)	NR	P	D	D	D
C. Project Location						
Plant and Associated Facilities	Defined (D)	P	P	D	D	D
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Communication Systems	Defined (D)	NR	P	D	D	D
Fire Protection and Life Safety	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Not Applicable (NA)	NR	NR			
E. Technology Selection						
Not Applicable						
F. Strategy						
Contracting/Sourcing	Preliminary (P)	NR	P			
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
Regulatory Approval & Permitting	Preliminary (P)	P	P			
Material Utilization (Borrow Sources)	Preliminary (P)	P	P	P/D		
Logistics Plan	Defined (D)	P	P	P	D	D
Work Breakdown Structure (WBS)	Preliminary (P)	P	P	P/D		
Decommissioning/Demolition Plan	Not Applicable (NA)	NR				
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
H. Studies						
Hydraulics	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Geotechnical Investigation	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Block Flow Diagrams	Not Applicable (NA)					
Hydraulic Design & Probable Maximum Flood (PMF)	Not Applicable (NA)					
Equipment Data Sheets	Preliminary (P)	NR/S	P			
Equipment Lists: Electrical	Preliminary (P)	NR/S	P			
Equipment Lists: Process/Utility/Mechanical	Complete (C)	NR/S	P	C	C	C
Design Specifications	Preliminary (P)	NR	S/P			
Electrical One-Line Drawings	Not Applicable (NA)	NR				
General Equipment Arrangement Drawings	Preliminary (P)	NR	S/P			
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Not Applicable (NA)	NR				
Civil/Site/Structural/Architectural Discipline Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Fire Protection & Life Safety Drawings & Details	Not Applicable (NA)	NR				
Mitigation Measures (Aquatic, Terrestrial, Heritage, etc.)	Not Applicable (NA)	NR				
Dam Design & Drawings	Not Applicable (NA)	NR				
De-silting Basins	Not Applicable (NA)	NR				
Gates & Cranes Design & Drawings	Not Applicable (NA)	NR				
Intake Design & Drawings	Not Applicable (NA)	NR				
Penstock Design & Drawings	Not Applicable (NA)	NR				
Power House Design & Drawings	Not Applicable (NA)	NR				
Spillway Design & Drawings	Not Applicable (NA)	NR				
Turbine and Generator Design & Drawings	Started (S)	NR	P			
Electrical Schedules	Not Applicable (NA)	NR	NR/S			
Instrument & Control Schedules	Not Applicable (NA)	NR	NR/S			
Instrument Data Sheets	Preliminary (P)	NR	NR/S	P	P/C	
Spare Parts Listings	Complete (C)	NR	NR	P	P/C	C
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Facility Emergency Communication Plan & Drawings	Preliminary (P)	NR	NR	S/P	P/C	
Information Systems/Telecommunication Drawings	Not Applicable (NA)	NR	NR			
Instrumentation/Control System Discipline Drawings	Preliminary (P)	NR	NR	S/P	P/C	
Mechanical Discipline Drawings	Started (S)	NR	NR	S/P		
Auxiliary Electrical Design & Drawings	Not Applicable (NA)	NR	NR			
Auxiliary Mechanical Design & Drawings	Started (S)	NR	NR	S		
Protection & Controls System Design & Drawings	Preliminary (P)	NR	NR	S	P	
	Total # Deliverables for this Project	7	25	25	20	16
	% Defined/Complete towards Class Estimate	100%	100%	78%	63%	50%

Comments:

This project is being submitted as an AACE Class 3 estimate. The deliverables of this project indicate that 76% of the Class 3 deliverables have been completed. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. NS Power has selected a 20% contingency to account for specific risks, including water management risks associated with the isolation of the unit to ensure work space is dry, and additional component refurbishments that may be required based on the as-found condition following isolation and unit disassembly, as there are components that are not accessible for assessment/inspection until after unit disassembly.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions

For the purposes of this document, the term *hydropower industries* is assumed to include private and public utilities involved with the production of electrical power, exclusive of transmission and distribution, using natural gravitational force of falling or flowing water, excluding tidal forces, to drive a turbine that powers a generator.

The common thread among private and public utilities (for the purpose of estimate classification) is their reliance on user requirements, statement of objectives, design reports (i.e. geotechnical investigations, sourcing borrow materials and hydraulic design/modeling) and/or environmental data collection and studies as primary scope defining documents. These documents are key deliverables in determining the degree of project definition, and thus the extent and maturity of estimate input information.

Cost estimates for hydropower facilities are typically composed of key features such as:

- Reservoir area preparation (e.g., clearing, removal of structures and earthmoving).
- River management (e.g., cofferdams, diversion channels or tunnels, sediment management plans, environmental monitoring programs).
- Principal structures (e.g., dams, dykes, intakes, penstocks, powerhouse(s), low level outlet(s), power tunnel(s), de-silting basin(s), and spillway structure(s)).
- Permanent infrastructure (e.g., access roads, railroads, bridges, offices, warehouse and housing).
- Temporary infrastructure (e.g., construction camp, site access roads, airport, workshops, construction power etc).
- Environmental mitigation features (e.g. fish ladder(s), water bypass and creation of new fish or wildlife habitat).
- Owner's costs (e.g., stakeholder involvement, licensing, studies and investigations, administration and overhead, catering.).

Some, but not all, of these features are unique to the hydropower industries.

Typical hydropower facilities may include: turbines, generators, exciters, governors, transformers, gates for intake, spillway and draft tubes, and supporting electrical, mechanical, telecom, protection, and control systems. The water storage reservoir is typically required to support the operations of the hydropower facility.

CI Number: C0068882

Title: TUC1 Generator Refurbishment

Start Date: 2025/09
In-Service Date: 2025/11
Final Cost Date: 2026/05
Function: Steam
Forecast Amount: $2,124,211

DESCRIPTION:

This project involves the disassembly and rotor out inspection of the TUC1 Generator and refurbishment of deficiencies required to ensure the generator continues to operate safely and reliably. The generator assembly includes one generator rotor assembly, one generator stator assembly, one generator exciter assembly, and one lube oil system.

This project also includes the installation of the generator flux probe for on-line condition monitoring of the Tufts Cove Unit 1 Generator Rotor. The flux probe provides on-line monitoring for rotor shorted turns. Shorted rotor turns occur as insulation ages, resulting in increased excitation current to achieve the same flux. Generators require rotor rewinding as the number of shorted turns. This enhanced monitoring allows NS Power to proactively check for anomalies which allows for earlier detection for operations that can reduce cost or outage time

The Tufts Cove Unit 1 generator is a 117 MVA nameplate that has been in service since 1965. It is driven by the Tufts Cove Unit 1 Steam Turbine. It operates at 3,600 RPM, and is a hydrogen cooled unit.

Based on the age of the Tufts Cove Unit 1 generator, and the findings during inspections of similar generators, this refurbishment is expected to include:

- Major generator inspection which includes inspection of the stator, rotor, retaining rings, hydrogen seals, slip rings, generator core, generator frame, high voltage bushings, bearings, and cooling system.
- Electrical testing
- Flux probe installation

Summary of Related CIs +/- 2 years
Pursuant to Section 11.2 of the CEJC, related CIs for Steam projects include “Work completed on the same asset (turbine, boiler, etc.) and on the same unit (Lingan Unit #3, for example)”

- No other projects in 2023, 2024, 2025, 2026 or 2027

Depreciation Class: Steam Production Plant - Tufts Cove 1

Estimated Life of the Asset: 30 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.4%

JUSTIFICATION:

Justification Criteria: Thermal

Sub Criteria: Equipment Refurbishment

Why do this project?

Completion of this project will extend the life of the generator and ensure continued safe and reliable operation of Tufts Cove Unit 1. Not completing this project would increase the risk of generator condition-driven forced outage, exposing the NS Power system to the potential of a lengthy loss of firm capacity, generation, and ancillary services provided by Tufts Cove Unit 1. A “run to failure” strategy is not appropriate because of the risk of collateral damage

to the rest of the unit and estimated lead time for a replacement unit. The unit would be inoperable for that extended timeframe, with no firm capacity replacement available.

Due to the changing utilization of the NS Power thermal fleet, units are required to operate in more flexible modes due to the increasing amount of intermittent renewable generation. Installing a flux probe to monitor the progress of shorted turns (which are driven by more flexible unit utilization) is a standard industry practice and recommended by the Electric Power Research Institute (EPRI). This online monitoring will support the generator rotor rewind interval and subsequent outage planning. There are no other industry acceptable methods to monitor generator rotor shorted turns.

The Tufts Cove Unit 1 provides the following necessary services to NS Power's system:

- Peaking Generation
- Spinning, 10, and 30-minute operating reserves
- Volt-Ampere Reactive (var) support

Why do this project now?

The Tufts Cove Unit 1 generator has accumulated more than 286,000 hours of operation and has over 540 Start/Stop cycles. The planned 2025 outage provides a controlled and efficient window to plan and execute the work. Failure to execute this work during this time could result in unplanned activity or failure of the generator prior to the next maintenance cycle. Completing this refurbishment during the 2025 planned outage will ensure efficient operation of the unit and aligns with NS Power's overall asset management strategy.

Why do this project this way?

Rotor out inspection is the recommended way to assess the condition of the rotor and is recommended based on the long-term asset management of Tufts Cove Unit 1.

Installing a flux probe to monitor for shorted turns in the rotor winding (which are driven by more flexible unit utilization) is a standard industry practice and recommended by the Electric Power Research Institute (EPRI). This online monitoring will support the generator rotor rewind interval and subsequent outage planning and scope. There are no other online industry acceptable methods to monitor generator rotor shorted turns. This enhanced monitoring allows NS Power to proactively check for anomalies which allows for earlier detection for operations that can reduce cost or outage time.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) and previous experience with generator refurbishment projects, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as an AACE Class 3 estimate with a contingency value appropriate to that range. NS Power has selected a 15 percent contingency for this project to account for specific risks. Specific risks are that the stator is original (placing its operating age at 60 years along with any other original components in the generator), potential additional costs of abatement due to asbestos in the generator, and potential additional costs for materials and contracts with current market conditions as compared to the estimate, which escalates the 2021 CI C0030529 TUC3 Generator Refurbishment project by 13 percent. Additional component refurbishments may be required based on the as-found condition following isolation and generator disassembly. TUC3 Generator Refurbishment (CI C0030529) is a recently completed project with a similar scope and used the entirety of its 10 percent contingency. The TUC1 Generator is a much older asset than TUC3 and the cost estimate is based on escalated estimates from CI C0030529 which carries more cost risk. Therefore, applying a 15 percent contingency on this project is considered appropriate.

CI Number : C0068882 - TUC1 Generator Refurbishment

Project Number C0068882

Parent CI Number : -

Asset Location : 1171 - 1171 Tufts Cove Unit 1; Commissioned 1965, 85 Mwh

Budget Version 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	1000 - SGP - Turbo Gen.Instal.	1,988,733
Retirements	1000 - SGP - Turbo Gen.Instal.	135,478
	Total Cost:	2,124,211
	Original Cost:	207,723

Location: Tufts Cove Generating Station
CI# : C0068882
Title: TUC1 Generator Refurbishment
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Electrician	PD	20	$ 404	$ 8,070		
Engineering	PD	60	$ 457	$ 27,394		
Maintenance Trades	PD	60	$ 411	$ 24,648		
Power Plant Technician	PD	10	$ 422	$ 4,222		
Utility Worker	PD	25	$ 286	$ 7,150		
			Sub-Total	$ 71,484		
OT Labour						
Maintenance Trades	PD	25	$ 822	$ 20,540		
Electrician	PD	10	$ 807	$ 8,070		
Power Plant Technician	PD	10	$ 844	$ 8,445		
Utility Worker	PD	25	$ 572	$ 14,300		
			Sub-Total	$ 51,355		
Term Labour						
Maintenance Trades	PD	10	$ 411	$ 4,108		
Utility Worker	PD	25	$ 286	$ 7,150		
			Sub-Total	$ 11,258		
Materials						
Flux Probe	EA	1	$ 50,000	$ 50,000		
H2 Seals and Parts	EA	2	$ 195,078	$ 390,157		C0030529
Misc. Materials & Consumables	Lot	1	$ 62,403	$ 62,403		C0030529
			Sub-Total	$ 502,560		
Contracts						
Dayshift and Nightshift Technical Field Advisor	EA	1	$ 193,422	$ 193,422		C0030529
Generator Rotor & Stator Inspections	EA	1	$ 269,169	$ 269,169		C0030529
Tooling & Shipping	EA	1	$ 83,998	$ 83,998		C0030529
Retaining Ring NDE	EA	1	$ 71,011	$ 71,011		C0030529
Night Shift Craft Labour	EA	1	$ 281,983	$ 281,983		C0030529
Scaffold (Wall / Rotor Enclosure)	EA	1	$ 35,000	$ 35,000		
Asbestos Abatement	EA	1	$ 15,000	$ 15,000		
			Sub-Total	$ 949,583		
Consulting						
TG Advisors	EA	1	$ 85,095	$ 85,095		C0030529
Engineering Preplanning	EA	1	$ 27,721	$ 27,721		C0030529
			Sub-Total	$ 112,816		
Other Goods & Services						
Contingency	%	15%	$ 1,699,056	$ 254,858		
			Sub-Total	$ 254,858		
Interest Capitalized						
AFUDC				$ 12,021		
			Sub-Total	$ 12,021		
Administrative Overhead						
Labour AO				$ 40,707		
Contractor AO				$ 117,568		
			Sub-Total	$ 158,275		
			SUB-TOTAL (no AO, AFUDC)	$ 1,953,915		
			TOTAL (AO, AFUDC included)	$ 2,124,211		
Original Cost				$ 207,723		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Process Industries	Required fields:	Estimate Classification				
Project Name: TUC1 Generator Refurbishment	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Non-Process Facilities (Infrastructure, Ports, Pipeline, Power Transmission)	Not Applicable (NA)					
Project Scope of Work Description	Preliminary (P)	P	P			
Byproduct and Waste Disposal	Not Applicable (NA)	NR				
Site Infrastructure (Access, Construction Power, Camp, etc.)	Not Applicable (NA)	NR				
B. Capacity						
Plant Production/Facility (includes power facilities)	Not Applicable (NA)					
Electrical Power Requirements (when not the primary capacity driver)	Not Applicable (NA)	NR				
C. Project Location						
Plant and Associated Facilities	Defined (D)	P	P	D	D	D
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Communication Systems	Not Applicable (NA)	NR				
Fire Protection and Life Safety	Not Applicable (NA)	NR				
Environmental Monitoring	Not Applicable (NA)	NR	NR			
E. Technology Selection						
Process Technology	Not Applicable (NA)					
F. Strategy						
Contracting/Sourcing	Preliminary (P)	NR	P			
Escalation	Not Applicable (NA)	NR				
G. Planning						
Logistics Plan	Not Applicable (NA)					
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Not Applicable (NA)	NR				
Project Schedule	Not Applicable (NA)	NR				
Regulatory Approval & Permitting	Not Applicable (NA)	NR				
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Block Flow Diagrams	Not Applicable (NA)					
Equipment Data Sheets	Complete (C)	NR/S	P	C	C	C
Equipment Lists: Electrical	Complete (C)	NR/S	P	C	C	C
Equipment Lists: Process/Utility/Mechanical	Not Applicable (NA)	NR/S				
Heat & Material Balances	Not Applicable (NA)	NR				
Process Flow Diagrams (PFDs)	Not Applicable (NA)	NR				
Utility Flow Diagrams (UFDs)	Not Applicable (NA)	NR				
Design Specifications	Complete (C)	NR	S/P	C	C	C
Electrical One-Line Drawings	Complete (C)	NR	S/P	C	C	C
General Equipment Arrangement Drawings	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Piping & Instrumentation Diagrams	Not Applicable (NA)	NR				
Plot Plans / Facility Layouts	Not Applicable (NA)	NR				
Construction Permits	Not Applicable (NA)	NR				
Civil/Site/Structural/Architectural Discipline Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Fire Protection & Life Safety Drawings & Details	Not Applicable (NA)	NR				
Electrical Schedules	Complete (C)	NR	NR/S	P	P/C	C
Instrument & Control Schedules	Complete (C)	NR	NR/S	P	P/C	C
Instrument Data Sheets	Not Applicable (NA)	NR	NR/S			
Piping Schedules	Not Applicable (NA)	NR	NR/S			
Piping Discipline Drawings	Not Applicable (NA)	NR	NR/S			
Spare Parts Listings	Preliminary (P)	NR	NR	P	P/C	
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Facility Emergency Communication Plan & Drawings	Not Applicable (NA)	NR	NR			
Information Systems/Telecommunication Drawings	Not Applicable (NA)	NR	NR			
Instrumentation/Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
0	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	2	10	11	11	10
	% Defined/Complete towards Class Estimate	100%	100%	85%	85%	85%

Comments:

This project is being submitted as an AACE Class 3 estimate, with approximately 85% of the deliverables defined and completed. According to AACE guidelines, a contingency value between 10% and 30% is recommended for Class 3 projects. Based on the contingency used in similar past projects, a 15% contingency has been applied here. This contingency addresses potential execution risks, such as that the stator is original (placing its operating age at 60 years along with any other original components in the generator), potential additional costs of abatement due to asbestos in the generator, and potential additional costs for materials and contracts with current market conditions as compared to the estimate, which escalates the 2021 CI C0030529 TUC3 Generator Refurbishment estimates.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions

For the purposes of this document, the term *process industries* is assumed to include firms involved with the manufacturing and production of chemicals, petrochemicals, and hydrocarbon processing. The common thread among these industries (for the purpose of estimate classification) is their reliance on process flow diagrams (PFDs), piping and instrument diagrams (P&IDs), and electrical one-line drawings as primary scope defining documents. These documents are key deliverables in determining the degree of project definition, and thus the extent and maturity of estimate input information. This RP applies to a variety of project delivery methods such as traditional design-bid-build (DBB), design-build (DB), construction management for fee (CM-fee), construction management at risk (CM-at risk), and private-public partnerships (PPP) contracting methods.

Estimates for process facilities center on mechanical and chemical process equipment, and they have significant amounts of piping, instrumentation, and process controls involved. As such, this recommended practice may apply to portions of other industries, such as pharmaceutical, utility, water treatment, metallurgical, converting, and similar industries.

Most plants also have significant electrical power equipment (e.g., transformers, switchgear, etc.) associated with them. As such, this RP also applies to electrical substation projects, either associated with the process plant, as part of power transmission or distribution infrastructure, or supporting the power needs of other facilities. This RP excludes power generating facilities and high-voltage transmission.

CI Number: C0068887

Title: TUC3 Turbine Valves Refurbishment

Start Date: 2025/10
In-Service Date: 2025/11
Final Cost Date: 2026/05
Function: Steam
Forecast Amount: $1,869,104

DESCRIPTION:

This project is for component refurbishment on the Turbine Main Steam and Reheat Steam Valves at Tufts Cove Unit 3. The project scope will include the replacement/refurbishment of valve body and associated internal components. The Emergency Stop Valve (ESV) and Governor Valve covers are being replaced because they are at the end of the material's serviceable life based on the findings and recommendations of the previous refurbishment in 2021.

The primary function of the Main Steam Valves is to regulate the steam flow to the turbine and control the power output of the steam turbine generator. The Reheat Steam Valves' main function is for overspeed protection. These valves are critical components of the steam turbine. Their functionality is crucial to the safe and reliable operation of the unit.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the Detailed CEJC, related CIs for Steam projects includes "work completed on the same asset (turbine, boiler, etc.) and on the same unit (Lingan Unit #3, for example)."

- 2023 – CI C0051135 - TUC2 Turbine Valve Refurbishment $1,048,924

Depreciation Class: Steam Production Plant - Tufts Cove 3

Estimated Life of the Asset: 25 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 1.0%

JUSTIFICATION:

Justification Criteria: Thermal

Sub Criteria: Equipment Refurbishment/Replacement

Why do this project?

This project is required in order to maintain the turbine in Tufts Cove Unit 3 according to NS Power Subject Matter Experts and Original Equipment Manufacturer's (OEM) recommendations. If this work is not completed, the reliability of the turbine would deteriorate, potentially resulting in the machine being unavailable to provide generation for an extended period of time.

Why do this project now?

Completing this project as part of the 2025 planned outage will mitigate the risk of unplanned outages due to valve failures. Valve failures are likely to occur if the unit is operated with 'out-of-tolerance' (i.e. physical dimensions exceeding OEM standards) components. A valve failure could include a small component failure that would require a week-long outage to repair. A failure of the turbine valves could also lead to an over-speed event, which could cause significant damage to the turbine and other plant equipment. An over-speed event would also put the safety of NS Power personnel at risk.

Why do this project this way?

The refurbishment work is recommended by NS Power Subject Matter Experts and the OEM to allow for the safe and reliable operation of the turbine. Total valve replacement is a viable alternative but has been determined to be a significantly more expensive option and is not required at this time.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment based on previous turbine valve refurbishment experience and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as an AACE Class 3 estimate with a contingency value appropriate to that range. NS Power has selected a 10% contingency project to account for risks of potential additional deterioration to components within the turbine valves than is currently known, because this additional scope can only be determined after taking the TUC3 turbine valves out of service for inspection. Recent Turbine Valve Refurbishment projects CI C0051135 TUC2 Turbine Valve Refurbishment and CI C0021584 TUC3 Turbine Valve Refurbishment included 15% and 10% of contingency respectively. C0051135 was approved for $1,048,924 and completed within budget. C0021584 was approved at $1.041,020 and completed overbudget at $1,113,050 (7%).

CI Number : C0068887 - TUC3 Turbine Valves Refurbishment **Project Number** C0068887

Parent CI Number : -

Asset Location : 1171 - 1171 Tufts Cove Unit 3; Commissioned 1976, 152 Mwh **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	1000 - SGP - Turbo Gen.Instal.	1,819,479
Retirements	1000 - SGP - Turbo Gen.Instal.	49,625
	Total Cost:	1,869,104
	Original Cost:	889,455

Capital Project Detailed Estimate

Location: Tufts Cove Generating Station
CI# : C0068887
Title: TUC3 Turbine Valves Refurbishment
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Electrician	PD	16	$ 388	$ 6,204		
Engineering	PD	20	$ 439	$ 8,786		
Maintenance Trades	PD	64	$ 395	$ 25,267		
Utility Worker	PD	16	$ 275	$ 4,400		
Technologists	PD	10	$ 359	$ 3,591		
			Sub-Total	$ 48,248		
OT Labour						
Electrician	PD	8	$ 776	$ 6,204		
Utility Worker	PD	8	$ 550	$ 4,400		
Maintenance Trades	PD	32	$ 776	$ 24,817		
Power Plant Technician	PD	8	$ 845	$ 6,758		
			Sub-Total	$ 42,179		
Term Labour						
Maintenance Trades	PD	32	$ 395	$ 12,634		
			Sub-Total	$ 12,634		
Materials						
Turbine Valves & Parts	Lot	1	[redacted]		Attachment 1	
Misc Materials & Consumables	Lot	1				
			Sub-Total	[redacted]		
Contracts						
Siemens TFA Support	lot	1	[redacted]		Attachment 2, Page 6, Item 1	
NDE Services	lot	1				
Replication Services	lot	1	$ 20,000	$ 20,000		
Scaffolding Services	lot	1	$ 20,000	$ 20,000		
Insulation Services	lot	1	$ 10,000	$ 10,000		
Boroscope Services	lot	1	$ 10,000	$ 10,000		
Grit Blasting Services	lot	1	$ 15,000	$ 15,000		
Machining Services	lot	1	$ 20,000	$ 20,000		
			Sub-Total	[redacted]		
Other Goods & Services						
Contingency	%	10%	$ 1,634,909	$ 163,491		
			Sub-Total	$ 163,491		
Administrative Overhead						
Labour AO				$ 30,777		
Contractor AO				$ 39,927		
			Sub-Total	$ 70,704		
			SUB-TOTAL (no AO, AFUDC)	$ 1,798,400		
			TOTAL (AO, AFUDC included)	$ 1,869,104		
Original Cost				$ 889,455		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

Nova Scotia POWER An Emera Company

Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Process Industries	Required fields:	Estimate Classification				
Project Name: TUC3 Turbine Refurbishment	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete					
General Project Data						
A. Scope						
Non-Process Facilities (Infrastructure, Ports, Pipeline, Power Transmission)	Not Applicable (NA)					
Project Scope of Work Description	Preliminary (P)	P	P			
Byproduct and Waste Disposal	Not Applicable (NA)	NR				
Site Infrastructure (Access, Construction Power, Camp, etc.)	Not Applicable (NA)	NR				
B. Capacity						
Plant Production/Facility (includes power facilities)	Not Applicable (NA)					
Electrical Power Requirements (when not the primary capacity driver)	Not Applicable (NA)	NR				
C. Project Location						
Plant and Associated Facilities	Not Applicable (NA)					
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Communication Systems	Not Applicable (NA)	NR				
Fire Protection and Life Safety	Not Applicable (NA)	NR				
Environmental Monitoring	Not Applicable (NA)	NR	NR			
E. Technology Selection						
Process Technology	Not Applicable (NA)					
F. Strategy						
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Not Applicable (NA)	NR				
G. Planning						
Logistics Plan	Not Applicable (NA)					
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Not Applicable (NA)	NR				
Project Schedule	Not Applicable (NA)	NR				
Regulatory Approval & Permitting	Not Applicable (NA)	NR				
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Block Flow Diagrams	Not Applicable (NA)					
Equipment Data Sheets	Complete (C)	NR/S	P	C	C	C
Equipment Lists: Electrical	Not Applicable (NA)	NR/S				
Equipment Lists: Process/Utility/Mechanical	Complete (C)	NR/S	P	C	C	C
Heat & Material Balances	Not Applicable (NA)	NR				
Process Flow Diagrams (PFDs)	Not Applicable (NA)	NR				
Utility Flow Diagrams (UFDs)	Not Applicable (NA)	NR				
Design Specifications	Complete (C)	NR	S/P	C	C	C
Electrical One-Line Drawings	Not Applicable (NA)	NR				
General Equipment Arrangement Drawings	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Piping & Instrumentation Diagrams	Not Applicable (NA)	NR				
Plot Plans / Facility Layouts	Not Applicable (NA)	NR				
Construction Permits	Not Applicable (NA)	NR				
Civil/Site/Structural/Architectural Discipline Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Fire Protection & Life Safety Drawings & Details	Not Applicable (NA)	NR				
Electrical Schedules	Not Applicable (NA)	NR	NR/S			
Instrument & Control Schedules	Not Applicable (NA)	NR	NR/S			
Instrument Data Sheets	Not Applicable (NA)	NR	NR/S			
Piping Schedules	Not Applicable (NA)	NR	NR/S			
Piping Discipline Drawings	Not Applicable (NA)	NR	NR/S			
Spare Parts Listings	Complete (C)	NR	NR	P	P/C	C
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Facility Emergency Communication Plan & Drawings	Not Applicable (NA)	NR	NR			
Information Systems/Telecommunication Drawings	Not Applicable (NA)	NR	NR			
Instrumentation/Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
Mechanical Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for Class Estimate	1	8	8	8	8
	% Defined/Complete towards Class Estimate	100%	100%	89%	89%	89%

Comments:

This project is being filed as a AACE Class 3 estimate. The defined deliverables for this project indicate that 89% of Class 3 deliverables are completed. AACE recommends applying between 10% and 30% contingency to estimates in this class. The project scope is preliminary based the expected findings based on run hours, asset age, and previous project experience. The TUC3 Turbine Valve Refurbishment is similar to work completed by NS Power in the past and a 10% contingency has been applied to the total project estimate.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions

For the purposes of this document, the term *process industries* is assumed to include firms involved with the manufacturing and production of chemicals, petrochemicals, and hydrocarbon processing. The common thread among these industries (for the purpose of estimate classification) is their reliance on process flow diagrams (PFDs), piping and instrument diagrams (P&IDs), and electrical one-line drawings as primary scope defining documents. These documents are key deliverables in determining the degree of project definition, and thus the extent and maturity of estimate input information. This RP applies to a variety of project delivery methods such as traditional design-bid-build (DBB), design-build (DB), construction management for fee (CM-fee), construction management at risk (CM-at risk), and private-public partnerships (PPP) contracting methods.

Estimates for process facilities center on mechanical and chemical process equipment, and they have significant amounts of piping, instrumentation, and process controls involved. As such, this recommended practice may apply to portions of other industries, such as pharmaceutical, utility, water treatment, metallurgical, converting, and similar industries.

Most plants also have significant electrical power equipment (e.g., transformers, switchgear, etc.) associated with them. As such, this RP also applies to electrical substation projects, either associated with the process plant, as part of power transmission or distribution infrastructure, or supporting the power needs of other facilities. This RP excludes power generating facilities and high-voltage transmission.

SIEMENS energy

SECL Ref: SF242223402
Cust Ref: Email
Date: 2024-09-25

To: NEIL GALLANT
NSPI

Subject: **PROPOSAL REV 1 FOR IP TURBINE AND VALVE PARTS O25**

With reference to your RFQ Email dated 26-Mar-24 , we are pleased to provide the following revised proposal for your consideration.

RFQ ITEM	DESCRIPTION	QTY	UNIT PRICE	TOTAL PRICE	EST DELIVERY (ARO)
1002	PILOT VALVE & SPINDLE [PILOT VALVE & EMERGENCY SPINDLE] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	1 EA	[redacted]		37 Weeks
1003	STRAINER STOP CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	2 EA			17 Weeks
1004	NO. 2 ESV SPINDLE CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	1 EA			37 Weeks
1005	3/8" UNF SPECIAL RETAINING SCREW FOR MK7 [3/8" UNF RETAINING SCREW LARGE HEAD L=1] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	2 EA			25 Weeks
1006	2-3/4" UN6 STUDS FOR ESV (LH & RH) [2.3/4" UN6 SPECIAL STUD A=10-13/16"] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	28 EA			23 Weeks
1007	2-3/4" UN6 CAPNUT FOR MK 16 [2.3/4" CAP NUT (STANDARD)] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	28 EA			23 Weeks
1009	3/4" UNF SPECIAL RETAINING SCREWS FOR MK 1 (LH & RH) [3/4" UNF RETAIN SCREW LARGE HEAD L=1.7/8] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	18 EA			23 Weeks
1010	NO.1 GV SPINDLE RH & LH (GUIDE FLOW) [No 1 Governor Valve Spindle (Guide Flow)] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	1 EA			37 Weeks
1011	NO.1 GV GLAND BUSH (BTM FOR RH & LH) [GOVERNOR VALVE GLAND BUSH (BOTTOM)] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	2 EA			25 Weeks
1012	NO.1 & 2 GV GLAND BUSH (TOP FOR RH & LH) [TOP BUSH FOR VALVE SPINDLE GLAND] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	4 EA			25 Weeks
1013	NO.2 GV GLAND BUSH (BTM FOR RH & LH) CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	2 EA			25 Weeks
1014	2-1/4" UN6 STUDS FOR GV COVERS [2.1/4"UN SPECIAL STUD (ELEC. HEAT)] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	40 EA			23 Weeks
1015	DESCRIPTION2-1/4" UN6 CAPNUTS FOR MK 29 [2.1/14" CAP NUT (STANDARD)] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	40 EA			23 Weeks
1016	NO.2 GV SPINDLE RH & LH (GUIDE FLOW) [No 2 Governor Valve Spindle (Guide Flow)] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	2 EA			37 Weeks
1017	ESV COVER PRELIMINARY MACHINING (REPLACEMENT) [ESV COVER] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	1 EA			35 Weeks
1018	GV COVER PRELIMINARY MACHINING (REPLACEMENT) [GOVERNOR VALVE COVER] CUSTOMER CAT ID: NA ASSY DWG NO.:[redacted] DETAIL DWG NO.:[redacted]	2 EA			35 Weeks
			PRICE		
			TOTAL PRICE:	[redacted]	

Prices: Price shown is in Canadian funds, Include any import duties that may be applicable, DDP Pt. Tupper, NSPI, but do not include any taxes. Price shown is also based on the quantities quoted. Should the order quantity differ from the quoted quantity, we reserve the right to amend the prices. A minimum order value of [redacted] applies.

Siemens Energy's pricing is subject to adjustment for the impact of any new or modified taxes, duties, tariffs or equivalent measures imposed by any local or foreign governmental authority which is applicable to our offering, including any portions or components contained within the offering.

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Validity: This proposal is valid for a period of 30 days from date of submission, unless extended, modified or withdrawn by Siemens Energy Canada Limited and limits acceptance to the terms set forth herein.

However, Siemens Energy reserves the right to revise pricing or lead time during this validity period in response to market conditions.

Quality Program: This offer is based on a Quality Program in accordance with: ISO 9001 2015

Payment Terms: Net 30 days.

Conditions of Sale: Terms and Conditions as defined and agreed upon in the Master Services Agreement (MSA), between Nova Scotia Power Inc. and Siemens Canada Ltd. effective April 2, 2019 shall apply, except as modified in this proposal.

The Parties acknowledge that there is an uncertain political and security situation in the world, in particular due to the invasion of Ukraine ("Uncertain Situation"), for which effects are difficult to foresee at the time of Contract signing and which can directly and indirectly affect the execution of this Contract including but not limited to the availability of certain equipment, commodities, metals, and materials as well as the availability of transportation means and services. In the light of the above, and in case of any public health event, contagion, pandemic, epidemic, endemic, outbreak (whether known or unknown) or quarantine, the Parties agree that Siemens Energy shall be entitled to reasonable adjustments of the delivery term(s) and/or the Contract price(s) to the extent any delay and costs are caused directly or indirectly by the above-mentioned Uncertain Situation and/or any related consequences.

Siemens Energy's obligation to fulfil this agreement is subject to the proviso that the fulfillment is not prevented by any impediments arising out of national or international foreign trade and customs requirements or any embargos [or other sanctions].

Feel free to contact us should you have any questions. We look forward to receive your instructions to proceed.

Regards,

Dutta Indraneel
Digitally signed by Dutta Indraneel
DN: cn=Dutta Indraneel, c=DE, o=Siemens, email=indraneel.dutta@siemens-energy.com
Date: 2024.09.25 15:16:17 -04'00'

Indraneel Dutta
Parts Business Leader
indraneel.dutta@siemens-energy.com

Dan Fearn
Digitally signed by Dan Fearn
DN: cn=Dan Fearn, c=CA, o=SECL, ou=GS, email=dan.fearn@siemens-energy.com
Date: 2024.09.26 11:49:33 -03'00'

EBA3
Dan Fearn, DSM

Beck Christin
Digitally signed by Beck Christin
DN: cn=Beck Christin, c=DE, o=Siemens, email=christin.beck@siemens-energy.com
Date: 2024.09.27 10:08:52 -04'00'

EBA3 Finance

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Customer	Nova Scotia Power
Proposal Description	2025 TUC3 Turbine Valves TFA & ITP
Submission Date	September 16, 2024
Prepared By	Luca Del Sordo Bid Management Specialist

Siemens Energy Canada Limited
Power Generation Services
1577 North Service Road East
Oakville, Ontario L6H 0H6

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September 16, 2024

Neil Gallant
Nova Scotia Power Inc.

Subject: **2025 TUC3 Turbine Valves TFA & ITP**
Siemens Energy Reference Number SF242294346

Dear Neil Gallant,

Siemens Energy Canada Limited (hereinafter, "Siemens Energy") appreciates the opportunity to present this proposal to Nova Scotia Power for the services described therein.

A review of this proposal will demonstrate the overall value of working with Siemens Energy on your unit and our significant value-added benefits to customers. As the original equipment manufacturer (OEM) of these units, Siemens Energy possesses all the original design and baseline information, which enable us to recommend the most appropriate maintenance and service offerings that will yield the highest unit availability and reliability. Our field engineers and technicians are fully trained and qualified on Siemens Energy generating equipment and represent the best personnel in the industry for servicing and maintaining that equipment. We are confident of our ability to deliver the highest quality service.

The information contained in this proposal and all related documents is proprietary and confidential information that belongs to Siemens Energy. This information is being disclosed to you for the specific purpose of your evaluation of Siemens Energy as a contractor for a particular project. By reviewing the information contained in these documents, you agree to be bound to a confidentiality obligation with respect to this information. Specifically, you hereby agree that (1) you will treat this information with the same level of care as you treat your own proprietary information; (2) you will not disclose this information to third parties without the prior written consent of Siemens Energy; and (3) you will not use this information for any purpose beyond evaluating Siemens Energy as a contractor and/or contracting with Siemens Energy for the particular project quoted herein.

The above terms supersede any click-wrap or other terms not expressly set forth in a signed agreement between the parties covering the proposal. All such click-wrap or other terms are expressly rejected by Siemens Energy.

Thank you for considering Siemens Energy to perform this service. We look forward to working on Nova Scotia Power's unit. Siemens Energy will be pleased to discuss this proposal, at your convenience, or any questions about our experience or capabilities. Please feel free to contact me if you have any questions regarding this proposal.

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With best regards,
Chris Holloway

Siemens Energy Canada Limited
Siemens Energy Gas Services
Mobile: +1 (709) 727-2526
mailto:chris.holloway@siemens-energy.com

EBA Technical	EBA Commercial
Luca Del Sordo Digitally signed by Luca Del Sordo DN: cn=Luca Del Sordo, c=CA, email=luca.del-sordo@siemens-energy.com Date: 2024.09.16 10:20:51 -04'00'	Rachel denBak Digitally signed by Den Bak Rachel DN: cn=Den Bak Rachel, c=DE, o=Siemens, email=rachel.denbak@siemens-energy.com Date: 2024.09.17 13:46:36 -04'00'

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Revision History

Date	Rev	Summary	Issued By
September 16, 2024	0	Original Issue	C. Holloway

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1.0 Scope of Work

Siemens Energy will provide one (1) onsite TFA and one (1) onsite EIT for the duration of the outage (estimated duration of 5 weeks), working a shift schedule of 1x10x6 to support NSPI with their valve inspections planned for the 2025 outage. An offsite engineer is also included for planning activities and ITP development.

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2.0 Commercial Considerations / Pricing

2.1 Pricing

Siemens Energy is pleased to offer the following pricing to Nova Scotia Power to perform the scopes of work as detailed in Section 1 of this proposal.

Item	Work Scope Description	Price Basis	Price (1-4)
1	Planning Support - ITP Generation and Readiness Review Execution Support - TFA and EIT	T&M	[redacted]

(1) Price is in 2024 Canadian Dollars and does not include sales tax. Sales tax will be added to the invoice. MSA Rates in effect at the time of execution shall apply.
(2) Fixed Price invoices will be submitted upon completion. T&M invoices will be invoiced per the MSA.
(3) Item 1 includes overtime hours and expenses only for the EIT.
(4) Day shift only

2.2 Quality Program

This offer is based on a Quality Program in accordance with ISO 9001:2015.

2.3 Environmental, Health & Safety

This offer is based on Siemens Energy "Zero Harm" program and in accordance with COR Certification Requirements.

2.4 Terms and Conditions

Terms and Conditions as defined and agreed upon in the Master Services Agreement (MSA), between Nova Scotia Power Inc. and Siemens Energy Canada Ltd., shall apply to the work scope in this proposal.

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CI Number: C0068659

Title: TRE5 IP-LP Turbine Refurbishment

Start Date: 2025/05
In-Service Date: 2025/07
Final Cost Date: 2026/01
Function: Steam
Forecast Amount: $1,282,670
DESCRIPTION:

This project includes inspection, refurbishment or replacement of components within the Intermediate and Low Pressure (IPLP) and the Dual Flow Low Pressure (DFLP) turbine on Unit 5. A partial dismantle of the IPLP and the DFLP is required to inspect for the presence or extent of any cracking of the turbine sections.

The Trenton Unit 5 turbine consists of a High Pressure turbine (HP), a combined IPLP turbine, and DFLP turbine which convert the energy from the high pressure/high temperature steam received from the Unit 5 boiler to mechanical energy which rotates the Unit5 generator, resulting in the production of electrical energy. The IP turbine section is subjected to high temperature and pressure service conditions and is affected over time by solid particle erosion and creep damage. The later stages of the IPLP and DFLP turbines are subject to higher stresses and concentrations of residual contaminants that can result in Stress Corrosion Cracking.

The Board provided the following Directive in its Decision pertaining to the Decarbonization Deferral Account (DDA) (M11220):

> NS Power must provide specific notice to all participants in this proceeding upon filing any future capital work order applications involving assets that are forecasted to be included in the DDA and to confirm this was done in its applications to the Board.

In accordance with the Board's directive, NS Power provided notice of this investment to participants in the DDA proceeding on December 9, 2024.

Summary of Related CIs +/- 2 years
Pursuant to Section 11.2 of the CEJC, related CIs for Steam projects includes "work completed on the same asset (turbine, boiler, etc.) and on the same unit (Lingan Unit #3, for example)."

- No other projects in 2023, 2024, 2025, 2026, or 2027

Depreciation Class: Steam Production Plant - Trenton 5

Estimated Life of the Asset: 32 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.5%

JUSTIFICATION:

Justification Criteria: Thermal

Sub Criteria: Equipment Refurbishment/Replacement

Why do this project?

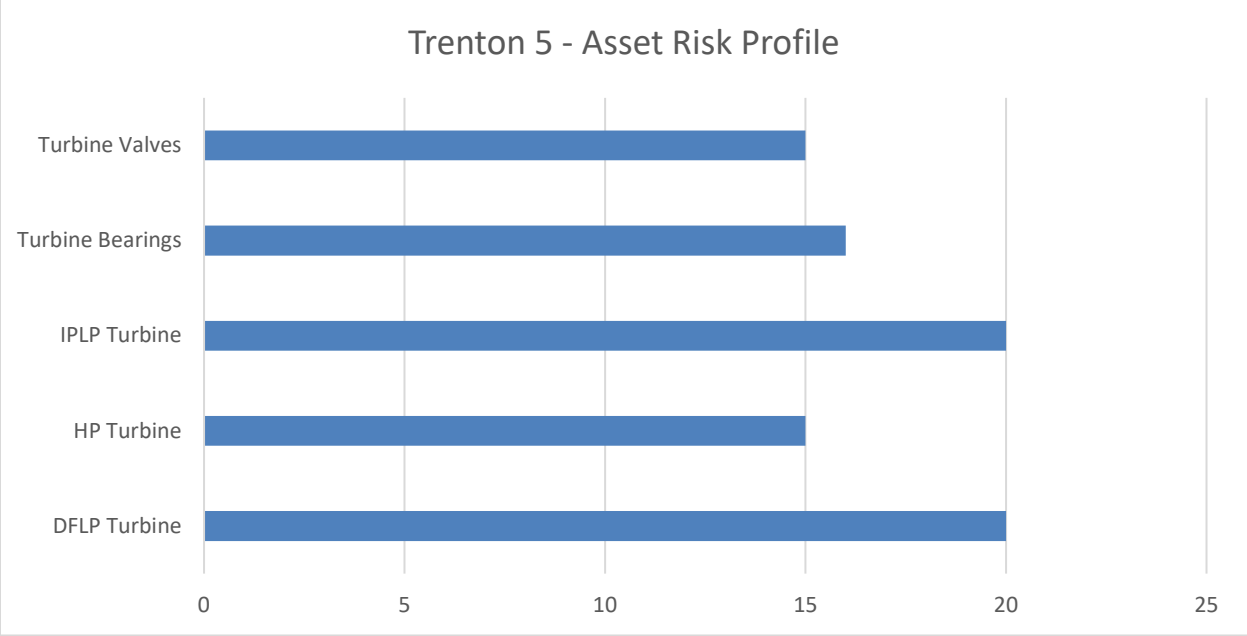
Unit 5 at Trenton has exceeded its maintenance strategy interval of 50,000 Hours and has accumulated 55,000 hours since the last maintenance outage in 2012. Due to the potential for cracking in the IPLP and the DFLP turbine rotating components, these turbine sections must be removed from service, inspected and refurbished or replaced as required. This will also identify operational reliability concerns and provide for continued safe and reliable operation of Unit 5 Turbine.

Why do this project now?

Unit 5 at Trenton has reached an inspection interval since the last maintenance outage in 2012. To ensure reliable and safe operation of Unit 5 Turbine it is recommended to complete this project during the 2025 calendar year. Consistent with future unit utilization that was shown in the 10-Year System Outlook, Trenton 5 will be required to provide reliable generating capacity further into the future than previously forecast, in order to meet increasing peak customer load requirements. NS Power has successfully deferred this project over the last number of years, but the asset condition and updated future unit utilization requires this work to be completed in 2025.

Completing this project in a planned manner, assessing current conditions, and mitigating against the risks of unplanned failure is the preferred approach to completing this work.

Steam turbine overhauls are scheduled based on accumulated operating hours and cycles and by known conditions within each unit. Below is a risk profile of Trenton 5 steam turbine Low Pressure (LP) and Intermediate Pressure (IP) Turbine components that show risks associated within each. The risk profile shows that while the machine is due for inspection there are also components that require refurbishment or replacement in the LP & IP sections to reduce operational risk.



Why do this project this way?

Completing an inspection of the IPLP and DFLP turbine sections is a cost-effective method and will allow for NS Power to determine and address high consequence risks that are present and identify and address reliability or safety risks. An alternative would be to complete a typical overhaul which undertakes a more extensive work scope which could lead to components being replaced / refurbished that are not required to operate the unit through its retirement date.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment based on previous turbine refurbishment experience and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value appropriate to that range. Risks intended to be covered by this contingency are potential additional work scope in the disassembly or deterioration to components within the Turbine sections which is currently unknown without inspection. Recent Turbine Refurbishment projects (CI 48893 TUC3 IP Turbine Refurbishment and CI 51053 TRE6 HIP Turbine Refurbishment) incurred approximately 10-20% of additional costs above the approved project budget, which included no contingency. Expectation is that the risk of additional work is lower compared to the projects listed above, therefore a 10% contingency is being applied to this project.

CI Number : C0068659 - TRE5 - IP-LP Turbine Refurbishment **Project Number** C0068659

Parent CI Number : -

Asset Location : 1165 - 1165 Trenton Unit 5; Commissioned 1969, 160 Mwh **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	1000 - SGP - Turbo Gen.Instal.	1,028,950
Retirements	1000 - SGP - Turbo Gen.Instal.	253,720
	Total Cost:	1,282,670
	Original Cost:	777,118

Capital Project Detailed Estimate

Location: Steam
CI# : C0068659
Title: TRE5 IP-LP Turbine Refurbishment
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Engineering	PD	30	$ 457	$ 13,706		
Power Engineer	PD	10	$ 439	$ 4,392		
Power Plant Technician	PD	25	$ 422	$ 10,548		
Utilityworker	PD	50	$ 286	$ 14,299		
			Sub-Total	$ 42,946		
Materials						
Turbine components	lot	1	$ 300,000	$ 300,000		
Fabrication	lot	1	$ 25,000	$ 25,000		
			Sub-Total	$ 325,000		
Contracts						
Inspection of the last stage blades/disc	lot	1	$ 200,000	$ 200,000		
Millwright Support	lot	1	$ 340,000	$ 340,000		
Technical Field Advisor	lot	1	$ 100,000	$ 100,000		
Machining	lot	1	$ 50,000	$ 50,000		
NDE inspection	lot	1	$ 10,000	$ 10,000		
			Sub-Total	$ 700,000		
Other Goods & Services						
Contingency	%	10%	$ 1,067,946	$ 106,795		
				$ -		
			Sub-Total	$ 106,795		
Interest Capitalized						
AFUDC				$ 5,138		
				$ -		
			Sub-Total	$ 5,138		
Administrative Overhead						
Labour AO				$ 16,125		
Contractor AO				$ 86,667		
			Sub-Total	$ 102,792		
			SUB-TOTAL (no AO, AFUDC)	$ 1,174,741		
			TOTAL (AO, AFUDC included)	$ 1,282,670		
Original Cost				$ 777,118		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Process Industries	Required fields:	Estimate Classification				
Project Name: TRE5 IP-LP Turbine Refurbishment	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Non-Process Facilities (Infrastructure, Ports, Pipeline, Power Transmission)	Not Applicable (NA)					
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Byproduct and Waste Disposal	Not Applicable (NA)	NR				
Site Infrastructure (Access, Construction Power, Camp, etc.)	Not Applicable (NA)	NR				
B. Capacity						
Plant Production/Facility (includes power facilities)	Not Applicable (NA)					
Electrical Power Requirements (when not the primary capacity driver)	Not Applicable (NA)	NR				
C. Project Location						
Plant and Associated Facilities	Defined (D)	P	P	D	D	D
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Communication Systems	Not Applicable (NA)	NR				
Fire Protection and Life Safety	Not Applicable (NA)	NR				
Environmental Monitoring	Not Applicable (NA)	NR	NR			
E. Technology Selection						
Process Technology	Not Applicable (NA)					
F. Strategy						
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Not Applicable (NA)	NR				
G. Planning						
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Not Applicable (NA)	NR				
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
H. Studies						
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Block Flow Diagrams	Not Applicable (NA)					
Equipment Data Sheets	Preliminary (P)	NR/S	P			
Equipment Lists: Electrical	Not Applicable (NA)	NR/S				
Equipment Lists: Process/Utility/Mechanical	Preliminary (P)	NR/S	P			
Heat & Material Balances	Not Applicable (NA)	NR				
Process Flow Diagrams (PFDs)	Not Applicable (NA)	NR				
Utility Flow Diagrams (UFDs)	Not Applicable (NA)	NR				
Design Specifications	Complete (C)	NR	S/P	C	C	C
Electrical One-Line Drawings	Not Applicable (NA)	NR				
General Equipment Arrangement Drawings	Not Applicable (NA)	NR				
Instrument List	Not Applicable (NA)	NR				
Piping & Instrumentation Diagrams	Not Applicable (NA)	NR				
Plot Plans / Facility Layouts	Started (S)	NR	S/P			
Construction Permits	Not Applicable (NA)	NR				
Civil/Site/Structural/Architectural Discipline Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Fire Protection & Life Safety Drawings & Details	Not Applicable (NA)	NR				
Electrical Schedules	Not Applicable (NA)	NR	NR/S			
Instrument & Control Schedules	Not Applicable (NA)	NR	NR/S			
Instrument Data Sheets	Not Applicable (NA)	NR	NR/S			
Piping Schedules	Not Applicable (NA)	NR	NR/S			
Piping Discipline Drawings	Not Applicable (NA)	NR	NR/S			
Spare Parts Listings	Preliminary (P)	NR	NR	P	P/C	
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Facility Emergency Communication Plan & Drawings	Not Applicable (NA)	NR	NR			
Information Systems/Telectommunication Drawings	Not Applicable (NA)	NR	NR			
Instrumentation/Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
Mechanical Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	3	12	10	9	8
	% Defined/Complete towards Class Estimate	100%	100%	77%	77%	69%

Comments:

This project is being filed as a AACE Class 3 estimate. The defined deliverables for this project indicate that 77% of Class 3 deliverables are completed. AACE recommends applying between 10% and 30% contingency to estimates in this class. The project scope is currently based on run hours, asset age, and previous project experience, but will be finalized upon inspection. The IP/LP Turbine Refurbishment is similar to work completed by NS Power in the past and a 10% contingency has been applied to the total project estimate.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions

For the purposes of this document, the term *process industries* is assumed to include firms involved with the manufacturing and production of chemicals, petrochemicals, and hydrocarbon processing. The common thread among these industries (for the purpose of estimate classification) is their reliance on process flow diagrams (PFDs), piping and instrument diagrams (P&IDs), and electrical one-line drawings as primary scope defining documents. These documents are key deliverables in determining the degree of project definition, and thus the extent and maturity of estimate input information. This RP applies to a variety of project delivery methods such as traditional design-bid-build (DBB), design-build (DB), construction management for fee (CM-fee), construction management at risk (CM-at risk), and private-public partnerships (PPP) contracting methods.

Estimates for process facilities center on mechanical and chemical process equipment, and they have significant amounts of piping, instrumentation, and process controls involved. As such, this recommended practice may apply to portions of other industries, such as pharmaceutical, utility, water treatment, metallurgical, converting, and similar industries.

Most plants also have significant electrical power equipment (e.g., transformers, switchgear, etc.) associated with them. As such, this RP also applies to electrical substation projects, either associated with the process plant, as part of power transmission or distribution infrastructure, or supporting the power needs of other facilities. This RP excludes power generating facilities and high-voltage transmission.

CI Number: C0031048

Title: 91H-T11 Transformer Replacement

Start Date: 2024/03
In-Service Date: 2025/12
Final Cost Date: 2026/06
Function: Transmission
Forecast Amount: $6,914,622

DESCRIPTION:

This project is for the replacement of the 91H-T11 transformer, which is an 83.3 MVA, 138 to 69kV autotransformer that connects the two transmission buses at Tufts Cove. Based on the Transformer Risk Profile, a review of this transformer's condition, and a criticality score of 4 has led to the determination that this transformer needs to be replaced.

In addition to the transformer replacement itself, the construction for this project is relatively complex due to the existing substation infrastructure. Specifically, the 69kV busbar encircling 91H-T11 necessitates the temporary removal and subsequent reinstallation of multiple structures, foundations, and conduits.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission projects include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- No other projects in 2023, 2024, 2025, 2026 or 2027

Depreciation Class: Transmission Plant – Station Equipment
Transmission Plant – Overhead Conductors and Devices

Estimated Life of the Asset: 40 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.1%

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

This transformer was manufactured in 1959, and at 65 years of age, all parts have reached their expected useful life. This transformer is experiencing repeated control issues of its on-load tapchanger. While repair efforts have been successful at allowing the tapchanger to function via local, manual operation, it can no longer be operated remotely without significant reinvestment or replacement of the tapchanger and its associated controls and drive mechanism, which would be of limited value given the complexity of the work and the age of the remaining components. Operating remotely is an ideal method for tap-changer control to reduce resources required for manual, onsite control.

This transformer has also leaked oil in recent years and is expected to experience more frequent leaks in the future. With this transformer's criticality, it is necessary to replace the whole transformer to overcome the tapchanger and leaking issues.

Why do this project now?

Given its assessed condition and the degraded functionality of the tapchanger, this transformer is considered to be at end of useful life and should be replaced. It is required to do this project now due to the Transformer Risk Profile condition rating of 4/5 and a risk of 16/20. With its criticality in the Metro area, it is necessary to replace this transformer now before its condition worsens. With the transformers current condition, overdue parts, and criticality to the system, it is necessary to replace the whole transformer now before conditions worsen.

The manual tap changer can introduce the possibility of human error during adjustments. Mistakes in these adjustments may result in incorrect voltage levels, potentially damaging equipment or leading to service interruptions from equipment automatically tripping from these voltage adjustments. Additionally, manual tap changers are less responsive to rapid changes in load conditions than automatic systems. This lack of responsiveness can lead to voltage fluctuations that might impact sensitive equipment. For these reasons, manual tap changer operations are not a long term solution, and should be replaced with an automatic system.

Why do this project this way?

Given the advanced age of the transformer and the complexities involved in necessary repairs, refurbishment is unlikely to significantly extend its lifespan compared to a complete replacement. Opting for a full replacement is the most effective solution to address all issues related to the tap changer and leaks, ensuring a more reliable and efficient operation moving forward. This proactive approach not only mitigates risks but also enhances overall system performance. The transformer is an important component in the transmission network in Halifax, connecting the 138kV and 69kV networks in the Dartmouth area. It also steps up generation from units at Tufts Cove Generating Station to the 138kV voltage level that allows them to serve provincial capacity and energy requirements. For these reasons, refurbishment is not an option.

Additionally, there may be frequent outages required to mitigate impact on customers, resulting in potential overtime. Even though 91H-T11 does not impact customers directly, outages during low-load times would be more ideal and switching procedures may occur at that time.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) based on the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value of 20% appropriate to that estimate range. Risks intended to be covered by this contingency are primarily related to unforeseen price increases. Additionally, if unexpected construction issues were to arise during installation, this contingency will cover any additional labour resources required.

CI Number : C0031048 - 91H-T11 Transformer Replacement **Project Number** C0031048

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0300 - TP - Bldg.,Struct.Grnd.	241,274
Additions	0700 - TP - Environmental	88,726
Additions	2200 - TP - Elec Contr.Equip.	40,793
Additions	3900 - TP - O/H Cond.	87,350
Additions	4300 - TP - Substn Dev.	111,555
Additions	4400 - TP - Substn.Transf.	6,254,401
Retirements	4300 - TP - Substn Dev.	32,136
Retirements	4400 - TP - Substn.Transf.	58,388
	Total Cost:	6,914,622
	Original Cost:	617,875

Capital Project Detailed Estimate

Location: Transmission
CI#: C0031048
Title: 91H-T11 Transformer Replacement
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Site Supervision	PD	39	$ 443	$ 17,483		
T&D Labour - PLT	PD	220	$ 427	$ 94,096		
Design	PD	361	$ 443	$ 160,082		
Commissioning	PD	68	$ 443	$ 30,114		
			Sub-Total	$ 301,775		
Overtime Labour						
T&D Labour - PLT	PD	10	$ 855	$ 8,250		
			Sub-Total	$ 8,250		
Materials						
Bldg.,Struct.Grnd.	Lot	1	$ 66,350	$ 66,350		
Elec Contr.Equip.	Lot	1	$ 8,000	$ 8,000		
Substn Dev.	Lot	1	$ 18,000	$ 18,000		
Substn.Transf.	Lot	1	$ 3,798,702	$ 3,798,702		
Environmental	Lot	1	$ 12,350	$ 12,350		
			Sub-Total	$ 3,903,402		
Travel Expense						
Travel Expense	Lot	1	$ 3,535	$ 3,535		
			Sub-Total	$ 3,535		
Freight						
Freight	Lot	1	$ 651,724	$ 651,724		
Contracts						
Bldg.,Struct.Grnd.	EA	1	$ 106,190	$ 106,190		
Substn.Transf.	EA	1	$ 110,400	$ 110,400		
Environmental	EA	1	$ 64,000	$ 64,000		
Substn Dev.	EA	1	$ 60,800	$ 60,800		
Field Supervision	EA	1	$ 15,750	$ 15,750		
O/H Conductor	EA	1	$ 22,920	$ 22,920		
			Sub-Total	$ 380,060		
Consulting						
Design	Lot	1	$ 50,250	$ 50,250		
			Sub-Total	$ 50,250		
Other Goods & Services						
Contingency	%	20%	$ 5,298,996	$ 1,059,799		
			Sub-Total	$ 1,059,799		
AFUDC Interest						
AFUDC Interest				$ 174,867		
			Sub-Total	$ 174,867		
Vehicle Overhead						
Vehicle AO				$ 152,698		
			Sub-Total	$ 152,698		
Administrative Overhead						
Labour AO				$ 173,273		
Contract AO				$ 54,989		
			Sub-Total	$ 228,262		
			SUB-TOTAL (no AO, AFUDC)	$ 6,358,795		
			TOTAL (AO, AFUDC included)	$ 6,914,622		
Original Cost				$ 617,875		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 91H-T11 Transformer Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Not Applicable (NA)					
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Not Applicable (NA)	NR				
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Not Applicable (NA)	NR				
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Defined (D)	NR	P	D	D	D
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Preliminary (P)	S	P			
Foundation / Structure (Tower) Design	Preliminary (P)	S	P			
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Complete (C)	NR	S/P	C	C	C
Construction Permits	Not Applicable (NA)	NR				
Geometric Layout, Alignment, Profile, Cross Section	Complete (C)	NR	S/P	P/C	C	C
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Started (S)	NR	S/P			
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Preliminary (P)	NR	S/P	P		
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation / Structure (Tower) Discipline Drawings	Started (S)	NR	S/P			
Tower / Structure Location / Spotting	Preliminary (P)	NR	S/P	P		
Instrument Datasheets	Complete (C)	NR	NR/S	P	P/C	C
Electrical Discipline Drawings	Preliminary (P)	NR	NR	S/P	P/C	
Instrumentation / Control System Discipline Drawings	Preliminary (P)	NR	NR	S/P	P/C	
	Total # Deliverables for this Project	6	21	21	19	17
	% Defined/Complete towards Class Estimate	100%	100%	84%	76%	68%

Comments:

This project is being submitted as an AACE Class 3 estimate, with approximately 84% of the deliverables defined and completed. According to AACE guidelines, a contingency value between 10% and 30% is recommended for Class 3 projects. This contingency addresses potential execution risks, such as schedule setbacks and possible increases in material and contract costs during the project.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0068961

Title: 2025 PCB Substation Sampling and Replacement

Start Date: 2025/01
In-Service Date: 2025/01
Final Cost Date: 2026/09
Function: Transmission
Forecast Amount: $6,650,933

DESCRIPTION:

This project provides for the sampling and replacement of substation assets that are PCB-contaminated or potentially PCB-contaminated. These assets include, but are not necessarily limited to instrument transformers, station service transformers, metering devices, substation lighting, capacitor banks, and voltage regulators. Per Federal regulations, NS Power must remove all oil-filled equipment with polychlorinated biphenyl (PCB) concentrations greater than or equal to 50 mg/kg by December 31, 2025.

A portion of the capital costs associated with this capital item will contribute toward settling the Company's Asset Retirement Obligation for PCB contaminated oil.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- No other projects in 2023, 2024, 2025, 2026 or 2027

Depreciation Class: Transmission Plant – Station Equipment

Estimated Useful Life: 30-40 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.3%

JUSTIFICATION:

Justification Criteria: Environment

Why do this project?

Environment and Climate Change Canada (ECCC) has committed to a policy of phasing out the use of PCBs in Canada. In support of this policy, NS Power is focused on eliminating all oil-filled electrical equipment containing PCBs in a concentration greater than or equal to 50 mg/kg before December 31, 2025, as required by the PCB Regulation SOR/2008-273.

Why do this project now?

Work must be completed prior to December 31, 2025 to be compliant with the regulation. There could be environmental regulation non-compliance and reliability implications if these assets fail prematurely; thus, it is prudent to replace these assets now.

This project is deemed in-service when the first device is replaced (forecast to be January 2025), therefore the Final Cost Date (September 2026) is listed as six months after the last device is forecast to be completed (March 2026).

Why do this project this way?

This project will be used to address substation devices that require sampling, investigation, or replacement under the PCB regulations across the province and will allow NS Power to address it in the manner that provides the least time, resources, and disruption to customers.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers, project managers, and field personnel), previous experience with PCB substation projects. projects such as CI C0041837 2022/2023 Substation Polychlorinated Biphenyl (PCB) Equipment Removal, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as an AACE Class 3 estimate with a contingency value appropriate to that range. A 10% contingency has been applied to this project. Risks intended to be covered by contingency include complications during some asset replacements which may arise in some difficult to access replacements associated with this project, leading to a higher level of effort to replace those specific assets such as seized bolts requiring structural work, and the potential for a small number of additional assets to test positive for PCB requiring replacement under this program.

CI Number : C0068961 - 2025 PCB Substation Sampling and Replacement **Project Number** C0068961

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	4300 - TP - Substn Dev.	1,748,262
Additions	4400 - TP - Substn.Transf.	2,622,393
Retirements	4300 - TP - Substn Dev.	912,111
Retirements	4400 - TP - Substn.Transf.	1,368,167
	Total Cost:	6,650,933
	Original Cost:	1,520,815

Capital Project Detailed Estimate

Location: Distribution
CI# : C0068961
Title: 2025 PCB Substation Sampling and Replacement
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Electrician	PD	919	$ 388	$ 356,928		
Engineering	PD	117	$ 443	$ 52,000		
Planner	PD	56	$ 383	$ 21,632		
PLT	PD	97	$ 427	$ 41,600		
Utility worker	PD	107	$ 388	$ 41,600		
			Sub-Total	$ 513,760		
OT Labour						
Electrician	PD	362	$ 777	$ 281,216		
Utility Worker	PD	14	$ 777	$ 10,816		
			Sub-Total	$ 292,032		
Travel Expense						
Accommodations	Lot	1	$ 4,000	$ 4,000		
Mileage	Lot	1	$ 6,000	$ 6,000		
			Sub-Total	$ 10,000		
Materials						
Voltage Regulator	Lot	1	$ 35,000	$ 35,000		
Poletop Transformer	Lot	1	$ 594,000	$ 594,000		
Metering Tanks	Lot	1	$ 200,000	$ 200,000		
Capacitor Bank	Lot	1	$ 225,000	$ 225,000		
Instrument Transformers	Lot	1	$ 375,000	$ 375,000		
Bushing	Lot	1	$ 702,000	$ 702,000		
Building Lighting	Lot	1	$ 100,000	$ 100,000		
Yard Lighting	Lot	1	$ 100,000	$ 100,000		
			Sub-Total	$ 2,331,000		
Contracts						
Regasketing	Lot	1	$ 360,000	$ 360,000		
PCB Disposal (Aevitas)	Lot	1	$ 350,000	$ 350,000		
Welder	Lot	1	$ 19,200	$ 19,200		
Oil Handler (Stark)	Lot	1	$ 390,000	$ 390,000		
Scaffolding	Lot	1	$ 3,600	$ 3,600		
ENV clean up	Lot	1	$ 42,000	$ 42,000		
Crane	Lot	1	$ 236,800	$ 236,800		
External PLT	Lot	1	$ 428,800	$ 428,800		
Substation Planning	Lot	1	$ 92,000	$ 92,000		
				$ -		
			Sub-Total	$ 1,922,400		
Consulting						
Sample Processing	Lot	1	$ 81,500	$ 81,500		
			Sub-Total	$ 81,500		
Meals						
Meals	Lot	1	$ 4,000	$ 4,000		
				$ -		
			Sub-Total	$ 4,000		
Other Goods & Services						
Contingency	%	10%	$ 5,154,692	$ 515,469		
			Sub-Total	$ 515,469		
Vehicle Overhead						
Vehicle AO				$ 329,149		
			Sub-Total	$ 329,149		
Administrative Overhead						
Labour AO				$ 373,605		
Contractor AO				$ 278,017		
			Sub-Total	$ 651,622		
			SUB-TOTAL (no AO, AFUDC)	$ 5,670,161		
			TOTAL (AO, AFUDC included)	$ 6,650,933		
Original Cost				$ 1,520,815		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name:2025 PCB Substation sampling and replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Preliminary (P)	P	P			
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Not Applicable (NA)	NR	NR			
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Not Applicable (NA)					
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Defined (D)	NR	P	D	D	D
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Not Applicable (NA)					
Foundation / Structure (Tower) Design	Complete (C)	S	P	C	C	C
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Complete (C)	NR	S/P	C	C	C
Construction Permits	Complete (C)	NR	S/P	P/C	C	C
Geometric Layout, Alignment, Profile, Cross Section	Not Applicable (NA)	NR				
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Complete (C)	NR	S/P	P	C	C
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Complete (C)	NR	S/P	P	C	C
Erosion Control Plan & Drawings	Complete (C)	NR	S/P	P	C	C
Foundation / Structure (Tower) Discipline Drawings	Complete (C)	NR	S/P	P	C	C
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	5	24	23	23	23
	% Defined/Complete towards Class Estimate	100%	100%	96%	96%	96%

Comments:

This project is being filed as an AACE Class 3 estimate. The deliverables of this project indicate that 96% of the Class 3 deliverables have been completed with minor exceptions in non-critical areas. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project.

This project fulfills a regulatory requirement for the replacement of PCB assets inside substations including instrument transformers, substation specific poletops, substation lighting, bushings that may contain PCBs in concentrations greater than 50 ppm.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0069232

Title: L6021 Replacements and Upgrades Phase 1

Start Date: 2025/04
In-Service Date: 2025/04
Final Cost Date: 2027/09
Function Class: Transmission
Forecast Amount: $3,253,068

DESCRIPTION:

L6021 is a 58.73 kilometer (282 structures) 138 kV transmission line, built in 1967, that connects the 9W Tusket and 30W Souriquois substations. This project is required to replace deteriorated assets that have been identified through NS Power's transmission line inspection program. This project includes the replacement of deteriorated assets on 62 structures.

The project scope includes:

- Structure Replacements: 44
- Structure Insulator Replacements: 4
- Structure Timber and Insulator Replacements: 9
- Structure Replacements and OHSW Replacements: 5

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2026 CI TBD – L6021 Replacement and Upgrades Phase 2 $TBD

Depreciation Class: Transmission Plant – Land Rights - Easements
Transmission Plant – Poles and Fixtures
Transmission Plant – Overhead Conductors and Devices

Estimated Life of the Asset: 45 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.05%

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

The NS Power transmission line inspection program identified deteriorated assets on this line that require replacement to avoid unplanned transmission interruptions. Failure to complete this project would compromise the reliable operation of this transmission line. Asset failures on this transmission line would decrease system redundancy.

Why do this project now?

This work has been prioritized based on the condition of the transmission line assets as determined through NS Power's transmission line inspection program results, as well as the criticality of the line to the overall system operation. This project is required to support the ongoing reliable operation of the transmission line.

This project is deemed in-service when the first portion of the work is complete (forecast to be April 2025), therefore the Final Cost Date (September 2027) is listed as six months after the work is forecast to be completed (March 2027).

Why do this project this way?

Replacing the existing deteriorated assets is the only technically feasible option to accomplish the intended scope of this project.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) based on previous line replacement and upgrade experience and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value appropriate to that range. Risks intended to be covered by this contingency are additional overtime work that may be required to complete the project within the available outage window, unforeseen material or contract cost increases, or unforeseen costs related to accessing structures in wet or remote locations. NS Power completes approximately 8-10 of these Transmission Line Replacement and Upgrade projects each year and generally experiences cost pressures in the 8-15 percent range above the NSUARB approved project budget which generally used a 10 percent contingency amount. Based on these past similar projects and recent volatility in material pricing, an increased contingency of 15 percent is being applied to this project.

CI Number : C0069232 - L6021 Replacements and Upgrades Phase 1 **Project Number** C0069232

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0200 - TP - Land Rights	15,000
Additions	3500 - TP - Wood Poles	1,870,226
Additions	3800 - TP - Insulators	84,914
Additions	3900 - TP - O/H Cond.	919,818
Retirements	3500 - TP - Wood Poles	298,670
Retirements	3800 - TP - Insulators	18,496
Retirements	3900 - TP - O/H Cond.	45,944
	Total Cost:	3,253,068
	Original Cost:	227,514

Capital Project Detailed Estimate

Location: Transmission
CI#: CI C0069232
Title: L6021 Replacements and Upgrades Ph 1
Execution Year: 2025-2027

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Design	PD	212	$ 443	$ 94,202		
T&D Labour - Site Supervision	PD	59	$ 443	$ 26,202		
T&D Labour - PLT	PD	26	$ 427	$ 10,994		
			Sub-Total	$ 131,398		
Materials						
Wood Poles	Lot	1		$ 421,112		
Insulators	Lot	1		$ 14,910		
O/H Conductor	Lot	1		$ 6,090		
			Sub-Total	$ 442,112		
Contracts						
Wood Poles	Lot	1		$ 1,129,368		
Insulators	Lot	1		$ 59,741		
O/H Conductor	Lot	1		$ 667,775		
Survey and Mapping	Lot	1		$ 25,000		
			Sub-Total	$ 1,881,884		
Royalty, Easement, Appraisal						
Permits	Lot	1		$ 15,000		
			Sub-Total	$ 15,000		
Other Goods & Services						
Contingency	%	15%	$ 2,470,394	$ 370,559		
			Sub-Total	$ 370,559		
Vehicle Overhead						
Vehicle AO				$ 65,552		
			Sub-Total	$ 65,552		
Administrative Overhead						
Labour AO				$ 74,405		
Contract AO				$ 272,158		
			Sub-Total	$ 346,563		
TOTAL (AO, AFUDC excluded)				$ 2,840,953		
TOTAL (AO, AFUDC included)				$ 3,253,068		
Original Cost				$ 227,514		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: L6021 Replacements and Upgrades Phase 1	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Preliminary (P)	NR	P			
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Preliminary (P)	NR	P			
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Preliminary (P)	NR	P			
Risk Register	Preliminary (P)	NR	P			
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Not Applicable (NA)	NR				
H. Studies						
Routing Options	Defined (D)	P	P	D	D	D
Topography & Bathymetry	Defined (D)	P	P	P/D	D	D
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Preliminary (P)	NR	P			
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Complete (C)	S	P	C	C	C
Foundation / Structure (Tower) Design	Preliminary (P)	S	P			
Route Mapping / Survey	Complete (C)	S/P	P/C	C	C	C
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Preliminary (P)	NR	S/P	P/C		
Geometric Layout, Alignment, Profile, Cross Section	Preliminary (P)	NR	S/P	P/C		
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Complete (C)	NR	S/P	P	C	C
Crossings and Borings Designs and Drawings	Preliminary (P)	NR	S/P	P		
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Preliminary (P)	NR	S/P	P		
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Complete (C)	NR	S/P	P	C	C
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	10	27	21	16	16
	% Defined/Complete towards Class Estimate	100%	100%	75%	57%	57%

Comments:

This project is being submitted as an AACE Class 3 estimate. The deliverables of this project inidcate that 75% of the Class 3 deliverables have been completed. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. Previous line replacement and upgrade projects have utulized 10% contingency on all estimated costs, due to the projects being similar, a 15% contingency has been applied. Contingency is intended to to account for risks associated with additional overtime work that may be required to complete the project within the available outage window, and any unforeseen material or contract cost increases.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
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- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0069227

Title: L6516 Replacements and Upgrades Phase 3

Start Date: 2025/09
In-Service Date: 2025/09
Final Cost Date: 2028/01
Function Class: Transmission
Forecast Amount: $3,104,925

DESCRIPTION:

L6516 is a 127 kilometre (508 Structures) 138kV transmission line, built in 1964, that connects the 2C Port Hastings and 2S Victoria Junction substations. This project is required to replace deteriorated assets that have been identified through NS Power's transmission line inspection program. The third phase of this project includes the replacement of deteriorated assets on 85 structures.

The project scope includes:

- Structure Replacements: 52 Structures
- Timber and Insulator Replacements: 9 Structures
- Insulator Replacements: 20 Structures
- Other Deteriorated Assets: 4 Structures

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2023 CI C0041788 – L6516 Replacements and Upgrades Phase 2 $5,442,794
- 2025 CI TBD - L6516 Replacements and Upgrades Phase 4 $TBD

Depreciation Class: Transmission Plant – Poles and Fixtures
Transmission Plant – Overhead Conductors and Devices
Transmission Plant – Land Rights - Easements

Estimated Life of the Asset: 45 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.04%

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

The NS Power transmission line inspection program identified deteriorated assets on this line that require replacement to avoid unplanned transmission interruptions. Failure to complete this project would compromise the reliable operation of this transmission line. Asset failures on this transmission line would decrease system redundancy.

Why do this project now?

This work has been prioritized based on the condition of the transmission line assets as determined through NS Power's transmission line inspection program results, as well as the criticality of the line to the overall system operation. This project is required to support the ongoing reliable operation of the transmission line.

This project is deemed in-service when the first portion of the work is complete (forecast to be September 2025), therefore the Final Cost Date (January 2028) is listed as six months after the work is forecast to be completed (July 2027).

Why do this project this way?

Replacing the existing deteriorated assets is the only technically feasible option to accomplish the intended scope of this project.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) based on previous line replacement and upgrade experience and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value appropriate to that range. Risks intended to be covered by this contingency are additional overtime work that may be required to complete the project within the available outage window, unforeseen material or contract cost increases, or unforeseen costs related to accessing structures in wet or remote locations. NS Power completes approximately 8-10 of these Transmission Line Replacement and Upgrade projects each year and generally experiences cost pressures in the 8-15 percent range above the NSUARB approved project budget which generally used a 10 percent contingency amount. Based on these past similar projects and recent volatility in material pricing, an increased contingency of 15 percent is being applied to this project.

CI Number : C0069227 - L6516 Replacements and Upgrades Phase 3 **Project Number** C0069227

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0200 - TP - Land Rights	10,000
Additions	3500 - TP - Wood Poles	1,689,575
Additions	3800 - TP - Insulators	102,834
Additions	3900 - TP - O/H Cond.	981,749
Retirements	3500 - TP - Wood Poles	245,503
Retirements	3800 - TP - Insulators	23,040
Retirements	3900 - TP - O/H Cond.	52,223
	Total Cost:	3,104,925
	Original Cost:	170,425

Capital Project Detailed Estimate

Location: Transmission
CI#: C0069227
Title: L6516 Replacements and Upgrades Phase 3
Execution Year: 2025-2027

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Design	PD	197	$ 443	$ 87,433		
T&D Labour - Site Supervision	PD	67	$ 443	$ 29,775		
T&D Labour - PLT Switching Line	PD	26	$ 427	$ 11,000		
			Sub-Total	$ 128,208		
Materials						
Wood Poles	Lot	1	$ 469,954	$ 469,954		
Insulators	Lot	1	$ 18,958	$ 18,958		
O/H Conductor	Lot	1	$ 45,332	$ 45,332		
			Sub-Total	$ 534,245		
Contracts						
Wood Poles	Lot	1	$ 926,204	$ 926,204		
Insulators	Lot	1	$ 72,947	$ 72,947		
O/H Conductor	Lot	1	$ 686,362	$ 686,362		
Survey and Mapping	Lot	1	$ 10,000	$ 10,000		
			Sub-Total	$ 1,695,513		
Royalty, Easement, Appraisal						
Permits	Lot	1	$ 10,000	$ 10,000		
			Sub-Total	$ 10,000		
Other Goods & Services						
Contingency	%	15%	$ 2,367,966	$ 355,195		
			Sub-Total	$ 355,195		
Vehicle Overhead						
Vehicle AO				$ 63,960		
			Sub-Total	$ 63,960		
Administrative Overhead						
Labour AO				$ 72,599		
Contract AO				$ 245,205		
			Sub-Total	$ 317,804		
			SUB-TOTAL (no AO, AFUDC)	$ 2,723,161		
			TOTAL (AO, AFUDC included)	$ 3,104,925		
Original Cost				$ 170,425		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: L6516 Replacements and Upgrades Phase 3	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Preliminary (P)	NR	P			
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Preliminary (P)	NR	P			
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Preliminary (P)	NR	P			
Risk Register	Preliminary (P)	NR	P			
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Not Applicable (NA)	NR				
H. Studies						
Routing Options	Defined (D)	P	P	D	D	D
Topography & Bathymetry	Defined (D)	P	P	P/D	D	D
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Preliminary (P)	NR	P			
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Complete (C)	S	P	C	C	C
Foundation / Structure (Tower) Design	Preliminary (P)	S	P			
Route Mapping / Survey	Complete (C)	S/P	P/C	C	C	C
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Preliminary (P)	NR	S/P	P/C		
Geometric Layout, Alignment, Profile, Cross Section	Preliminary (P)	NR	S/P	P/C		
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Complete (C)	NR	S/P	P	C	C
Crossings and Borings Designs and Drawings	Preliminary (P)	NR	S/P	P		
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Preliminary (P)	NR	S/P	P		
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Complete (C)	NR	S/P	P	C	C
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	10	27	21	16	16
	% Defined/Complete towards Class Estimate	100%	100%	75%	57%	57%

Comments:

This project is being submitted as an AACE Class 3 estimate. The deliverables of this project indicate that 75% of the Class 3 deliverables have been completed. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. Previous line replacement and upgrade projects have utilized 10% contingency on all estimated costs, due to the projects being similar, a 15% contingency has been applied. Contingency is intended to account for risks associated with additional overtime work that may be required to complete the project within the available outage window, and any unforeseen material or contract cost increases.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route, the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0069231

Title: L8002 Replacements and Upgrades Phase 1

Start Date:	2025/06
In-Service Date:	2025/06
Final Cost Date:	2027/11
Function Class:	Transmission
Forecast Amount:	$3,093,176

DESCRIPTION:

L8002 is a 106.13 kilometer (472 structures) 345 kV transmission line, built in 1990, that connects the 67N Onslow and 103H Lakeside substations. This project is required to replace deteriorated assets that have been identified through NS Power's transmission line inspection program. This project includes the replacement of deteriorated assets on 39 structures.

The project scope includes:

- Structure Replacement: 30
- Timber and Insulator Replacement: 2
- Other Deteriorated Asset Replacement: 7

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2026 CI TBD – L8001 Replacements and Upgrades Phase 2 $TBD
- 2027 CI TBD – L8001 Replacements and Upgrades Phase 3 $TBD

Depreciation Class: Transmission Plant – Poles and Fixtures
Transmission Plant – Overhead Conductors and Devices
Transmission Plant – Land Rights - Easements
Transmission Plant – Station Equipment

Estimated Life of the Asset: 45 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.4%

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

The NS Power transmission line inspection program identified deteriorated assets on this line that require replacement to avoid unplanned transmission interruptions. Failure to complete this project would compromise the reliable operation of this transmission line. Asset failures on this transmission line would decrease system redundancy.

Why do this project now?

This work has been prioritized based on the condition of the transmission line assets as determined through NS Power's transmission line inspection program results, as well as the criticality of the line to the overall system operation. This project is required to support the ongoing reliable operation of the transmission line.

This project is deemed in-service when the first portion of the work is complete (forecast to be June 2025), therefore the Final Cost Date (November 2027) is listed as six months after the work is forecast to be completed (May 2027).

Why do this project this way?

Replacing the existing deteriorated assets is the only technically feasible option to accomplish the intended scope of this project.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) based on previous line replacement and upgrade experience and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value appropriate to that range. Risks intended to be covered by this contingency are additional overtime work that may be required to complete the project within the available outage window, unforeseen material or contract cost increases, or unforeseen costs related to accessing structures in wet or remote locations. NS Power completes approximately 8-10 of these Transmission Line Replacement and Upgrade projects each year and generally experiences cost pressures in the 8-15 percent range above the NSUARB approved project budget which generally used a 10 percent contingency amount. Based on these past similar projects and recent volatility in material pricing, an increased contingency of 15 percent is being applied to this project.

CI Number : C0069231 - L8002 Replacements and Upgrades Phase 1 **Project Number** C0069231

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0200 - TP - Land Rights	30,000
Additions	3500 - TP - Wood Poles	2,151,488
Additions	3800 - TP - Insulators	18,106
Additions	3900 - TP - O/H Cond.	328,712
Additions	6200 - TP - Fibre Optics	38,465
Retirements	3500 - TP - Wood Poles	523,106
Retirements	3800 - TP - Insulators	3,299
	Total Cost:	3,093,176
	Original Cost:	1,078,631

Capital Project Detailed Estimate

Location: Transmission
CI#: C0069231
Title: L8002 Replacements and Upgrades Phase 1
Execution Year: 2025-2027

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Site Supervision	PD	48	$ 443	$ 21,438		
Design - Engineering	PD	169	$ 443	$ 75,071		
Design - Planning	PD	27	$ 443	$ 11,753		
T&D Labour - PLT	PD	23	$ 427	$ 10,000		
			Sub-Total	$ 118,262		
Materials						
Wood Poles	Lot	1	$ 580,199	$ 580,199		
Insulators	Lot	1	$ 3,876	$ 3,876		
Fibre Optics	Lot	1	$ 3,569	$ 3,569		
			Sub-Total	$ 587,643		
Contracts						
Wood Poles	EA	1	$ 1,348,917	$ 1,348,917		
Insulators	EA	1	$ 11,400	$ 11,400		
O/H Conductor	EA	1	$ 225,140	$ 225,140		
Fibre Optics	EA	1	$ 22,799	$ 22,799		
Survey and Mapping	EA	1	$ 30,000	$ 30,000		
			Sub-Total	$ 1,638,255		
Royalty, Easement, Appraisal						
Permits	Lot	1	$ 30,000	$ 30,000		
			Sub-Total	$ 30,000		
Other Goods & Services						
Contingency	%	15%	$ 2,374,161	$ 356,124		
			Sub-Total	$ 356,124		
Vehicle Overhead						
Vehicle AO				$ 58,999		
			Sub-Total	$ 58,999		
Administrative Overhead						
Labour AO				$ 66,967		
Contract AO				$ 236,925		
			Sub-Total	$ 303,892		
			SUB-TOTAL (no AO, AFUDC)	$ 2,730,285		
			TOTAL (AO, AFUDC included)	$ 3,093,176		
Original Cost				$ 1,078,631		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: L8002 Replacements and Upgrades Phase 1	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Preliminary (P)	NR	P			
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Preliminary (P)	NR	P			
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Preliminary (P)	NR	P			
Risk Register	Preliminary (P)	NR	P			
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Not Applicable (NA)	NR				
H. Studies						
Routing Options	Defined (D)	P	P	D	D	D
Topography & Bathymetry	Defined (D)	P	P	P/D	D	D
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Preliminary (P)	NR	P			
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Complete (C)	S	P	C	C	C
Foundation / Structure (Tower) Design	Preliminary (P)	S	P			
Route Mapping / Survey	Complete (C)	S/P	P/C	C	C	C
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Preliminary (P)	NR	S/P	P/C		
Geometric Layout, Alignment, Profile, Cross Section	Preliminary (P)	NR	S/P	P/C		
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Complete (C)	NR	S/P	P	C	C
Crossings and Borings Designs and Drawings	Preliminary (P)	NR	S/P	P		
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Preliminary (P)	NR	S/P	P		
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Complete (C)	NR	S/P	P	C	C
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	10	27	21	16	16
	% Defined/Complete towards Class Estimate	100%	100%	75%	57%	57%

Comments:

This project is being submitted as an AACE Class 3 estimate. The deliverables of this project inidcate that 75% of the Class 3 deliverables have been completed. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. Previous line replacement and upgrade projects have utulized 10% contingency on all estimated costs, due to the projects being similar, a 15% contingency has been applied. Contingency is intended to to account for risks associated with additional overtime work that may be required to complete the project within the available outage window, and any unforeseen material or contract cost increases.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0070048

Title: L5027B Replacements and Upgrades Phase 1

Start Date: 2025/02
In-Service Date: 2025/02
Final Cost Date: 2027/07
Function Class: Transmission
Forecast Amount: $2,916,728

DESCRIPTION:

L5027B is a 52.7 kilometer (616 structures) 69 kV transmission line, built in 1966, that connects the 21W Lower Woods Harbour, 22W Barrington Passage, 23W Clyde River, 25W Ohio Road, and 30W Souriquois substations. This project is required to replace deteriorated assets that have been identified through NS Power's transmission line inspection program. This project includes the replacement of deteriorated assets on 75 structures.

The project scope includes:

- Structure Replacements: 44
- Timber and Insulator Replacements: 30
- Other Deteriorated Asset Replacements: 1

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2026 CI TBD – L5027B Replacements and Upgrades Phase 2 $TBD

Depreciation Class: Transmission Plant – Poles and Fixtures
Transmission Plant – Overhead Conductors and Devices
Transmission Plant – Land Rights - Easements

Estimated Life of the Asset: 45 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.05%

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

The NS Power transmission line inspection program identified deteriorated assets on this line that require replacement to avoid unplanned transmission interruptions. Failure to complete this project would compromise the reliable operation of this transmission line. Asset failures on this transmission line would decrease system redundancy.

Why do this project now?

This work has been prioritized based on the condition of the transmission line assets as determined through NS Power's transmission line inspection program results, as well as the criticality of the line to the overall system operation. This project is required to support the ongoing reliable operation of the transmission line.

This project is deemed in-service when the first portion of the work is complete (forecast to be February 2025), therefore the Final Cost Date (July 2027) is listed as six months after the work is forecast to be completed (January 2027).

Why do this project this way?

Replacing the existing deteriorated assets is the only technically feasible option to accomplish the intended scope of this project.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) based on previous line replacement and upgrade experience and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value appropriate to that range. Risks intended to be covered by this contingency are additional overtime work that may be required to complete the project within the available outage window, unforeseen material or contract cost increases, or unforeseen costs related to accessing structures in wet or remote locations. NS Power completes approximately 8-10 of these Transmission Line Replacement and Upgrade projects each year and generally experiences cost pressures in the 8-15 percent range above the NSUARB approved project budget which generally used a 10 percent contingency amount. Based on these past similar projects and recent volatility in material pricing, an increased contingency of 15 percent is being applied to this project.

CI Number : C0070048 - L5027B Replacements and Upgrades Phase 1 **Project Number** C0070048

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0200 - TP - Land Rights	40,000
Additions	3500 - TP - Wood Poles	2,214,538
Additions	3800 - TP - Insulators	11,647
Additions	3900 - TP - O/H Cond.	482,594
Retirements	3500 - TP - Wood Poles	161,111
Retirements	3800 - TP - Insulators	557
Retirements	3900 - TP - O/H Cond.	6,281
	Total Cost:	2,916,728
	Original Cost:	248,395

Capital Project Detailed Estimate

Location: Transmission
CI#: C0070048
Title: L5027B Replacements and Upgrades
Execution Year: 2025-2026

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Design	PD	197	$ 443	$ 87,185		
T&D Labour - Site Supervision	PD	54	$ 443	$ 23,820		
			Sub-Total	$ 111,005		
Materials						
Wood poles	Lot	1		$ 254,629		
Insulators	Lot	1		$ 3,622		
O/H Conductors	Lot	1		$ 12,205		
			Sub-Total	$ 270,457		
Contracts						
Wood poles	Lot	1		$ 1,407,552		
Insulators	Lot	1		$ 4,866		
O/H Conductors	Lot	1		$ 324,833		
Survey and Mapping	Lot	1		$ 50,000		
			Sub-Total	$ 1,787,250		
Royalty, Easement, Appraisal						
Permits	Lot	1		$ 40,000		
			Sub-Total	$ 40,000		
Other Goods & Services						
Contingency	%	15%	$ 2,208,713	$ 331,307		
			Sub-Total	$ 331,307		
Vehicle Overhead						
Vehicle AO				$ 55,378		
			Sub-Total	$ 55,378		
Administrative Overhead						
Labour AO				$ 62,858		
Contract AO				$ 258,472		
			Sub-Total	$ 321,330		
			SUB-TOTAL (no AO, AFUDC)	$ 2,540,020		
			TOTAL (AO, AFUDC included)	$ 2,916,728		
Original Cost				$ 248,395		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: L5027B Replacements and Upgrades Phase 1	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Preliminary (P)	NR	P			
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Preliminary (P)	NR	P			
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Preliminary (P)	NR	P			
Risk Register	Preliminary (P)	NR	P			
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Not Applicable (NA)	NR				
H. Studies						
Routing Options	Defined (D)	P	P	D	D	D
Topography & Bathymetry	Defined (D)	P	P	P/D	D	D
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Preliminary (P)	NR	P			
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Complete (C)	S	P	C	C	C
Foundation / Structure (Tower) Design	Preliminary (P)	S	P			
Route Mapping / Survey	Complete (C)	S/P	P/C	C	C	C
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Preliminary (P)	NR	S/P	P/C		
Geometric Layout, Alignment, Profile, Cross Section	Preliminary (P)	NR	S/P	P/C		
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Complete (C)	NR	S/P	P	C	C
Crossings and Borings Designs and Drawings	Preliminary (P)	NR	S/P	P		
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Preliminary (P)	NR	S/P	P		
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Complete (C)	NR	S/P	P	C	C
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	10	27	21	16	16
	% Defined/Complete towards Class Estimate	100%	100%	75%	57%	57%

Comments:

This project is being submitted as an AACE Class 3 estimate. The deliverables of this project indicate that 75% of the Class 3 deliverables have been completed. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. Previous line replacement and upgrade projects have utilized 10% contingency on all estimated costs, due to the projects being similar, a 15% contingency has been applied. Contingency is intended to account for risks associated with additional overtime work that may be required to complete the project within the available outage window, and any unforeseen material or contract cost increases.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

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Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0053295

Title: L-5004 Kearney Lake Structure Replacement

Start Date:	2023/06
In-Service Date:	2026/05
Final Cost Date:	2027/06
Function:	Transmission
Forecast Amount:	$2,478,537

DESCRIPTION:

This project includes the removal of nine existing wooden pole structures and replacing them with six new steel pole structures to increase the reliability and the useful life of the transmission Line L-5004 in Kearney Lake.

L5004 is a 13.06-kilometer 69kV transmission line that was originally built in 1966. This project is required to increase the safety, reliability, and serviceability of the line, specifically the portion of the line spanning the lake and neighbouring arterial roadway Kearney Lake Rd. NS Power's current infrastructure within and surrounding the lake is reaching the end of its serviceability lifespan and requires replacement.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- No other projects in 2023, 2024, 2025, 2026, or 2027.

Depreciation Class: Transmission Plant - Land Rights – Easements
Transmission Plant - Station Equipment
Transmission Plant - Overhead Conductors and Devices
Transmission Plant - Towers and Fixtures

Estimated Life of the Asset: 100 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal
- Percentage of Asset Pool: 0.02%

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

Based on assessment from the transmission inspection program, the deteriorated condition of these assets, along with the existing and rapidly growing customer base for the Kearney Lake area, all indications that the transmission structures within and around the lake are required to be removed and replaced to mitigate the risk of disruption to NS Power's transmission system. Not completing this project would compromise the reliability of the transmission feeder and continue to compromise the ability to quickly return the feeder to service if any repairs are required.

Why do this project now?

Upon completion of this project the reliability of the transmission line will be significantly increased due to the removal and replacement of end of life assets and mitigating unplanned and unforeseen customer impacts that will occur if the line is left in its current state. This feeder currently supplies power to almost 30,000 commercial and residential customers. In the event of a failure, these customers will be out of power until NS Power can conduct repairs to the feeder. Since some of these poles are located inside the lake, this increases the recovery time exponentially, as well as the repair costs. The new structure locations will be accessible by roadway, hence reducing recovery time and related repair costs drastically.

This project is deemed in-service when the first portion of the work is complete (forecast to be May 2026), therefore the Final Cost Date (June 2027) is listed as six months after the work is forecast to be completed (December 2026).

Why do this project this way?

Replacing the existing deteriorated assets is the only technically feasible option to accomplish the intended scope of this project. The new design will result in stronger metallic structures with greater clearances and enhanced durability to reduce the likelihood of failure of the feeder section across the lake. The proposed location of the new structure is strategic and will position the structures in proximity to the roadway for easy access for inspection and maintenance. The improved structures and wire rating will allow for seamless expansion, looking to the near future in the form of new customers to the area.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment based on experience gained in previous transmission capital projects of this nature and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value of 15% appropriate to that range. Contingency is intended to account for market fluctuations for steel pole procurement, as well as land access requirements that may be encountered for heavy machinery required to construct the new structures. In addition, this project involves working in proximity to the Kearney Lake body of water, which may result in additional risks and associated costs during construction of the foundations, steel pole installation and removal of the existing wooden pole structures which are located inside the lake. These may include underwater activities, the use of specialized equipment to install the new structures.

CI Number : C0053295 - L5004 Kearney Lake Structure Replacement **Project Number** C0053295

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0200 - TP - Land Rights	50,000
Additions	0300 - TP - Bldg.,Struct.Grnd.	977,128
Additions	3700 - TP - Steel Towers	796,115
Additions	3900 - TP - O/H Cond.	411,047
Retirements	3500 - TP - Wood Poles	181,587
Retirements	3900 - TP - O/H Cond.	62,659
	Total Cost:	2,478,537
	Original Cost:	85,196

Capital Project Detailed Estimate

Location: Transmission
CI#: C0053295
Title: L-5004 Kearney Lake Structure Replacement
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Engineering	PD	10	$ 443	$ 4,345		
T&D Labour - Project Management	PD	13	$ 443	$ 5,854		
T&D Labour - Design	PD	29	$ 450	$ 13,260		
T&D Labour - PLT Switching	PD	15	$ 403	$ 6,045		
T&D Labour - Site Supervision	PD	27	$ 443	$ 12,150		
T&D Labour - Planning	Lot	23	$ 443	$ 10,000		
			Sub-Total	$ 51,654		
Materials						
Project Material(conductor and all fitting hardware)	Lot	1	$ 94,541	$ 94,541		
NEW STR 44	Lot	1	$ 29,795	$ 29,795		
NEW STR 45	Lot	1	$ 42,115	$ 42,115		
NEW STR 46	Lot	1	$ 44,415	$ 44,415		
NEW STR 47	Lot	1	$ 55,615	$ 55,615		
NEW STR 43	Lot	1	$ 70,000	$ 70,000		
NEW STR 50	Lot	1	$ 70,000	$ 70,000		
NEW Steel Cross Arms	Lot	4	$ 2,000	$ 8,000		
NEW STR 44 Foundation	Lot	1	$ 27,440	$ 27,440		
NEW STR 45 Foundation	Lot	1	$ 27,440	$ 27,440		
NEW STR 46 Foundation	Lot	1	$ 27,440	$ 27,440		
NEW STR 47 Foundation	Lot	1	$ 36,400	$ 36,400		
NEW STR 43 Foundation	Lot	1	$ 41,160	$ 41,160		
NEW STR 50 Foundation	Lot	1	$ 41,160	$ 41,160		
			Sub-Total	$ 615,521		
Contracts						
Vegetation Clearing	Lot	1	$ 50,000	$ 50,000		
NEW STR 44 Foundation	Lot	1	$ 41,160	$ 41,160		
NEW STR 45 Foundation	Lot	1	$ 41,160	$ 41,160		
NEW STR 46 Foundation	Lot	1	$ 41,160	$ 41,160		
NEW STR 47 Foundation	Lot	1	$ 54,600	$ 54,600		
NEW STR 43 Foundation	Lot	1	$ 61,740	$ 61,740		
NEW STR 50 Foundation	Lot	1	$ 61,740	$ 61,740		
Tear down (Wooden) and Rebuild (Steel Erection & Framing)	Lot	1	$ 297,000	$ 297,000		
Dive Support	Lot	1	$ 35,000	$ 35,000		
Eng Construction Geo-Tech Support	Lot	1	$ 30,000	$ 30,000		
Environmental Asset Disposal	Lot	14	$ 4,500	$ 63,000		
Environmental and Permits	Lot	1	$ 51,591	$ 51,591		
Traffic Control (Flagging)	Lot	1	$ 50,000	$ 50,000		
QA/QC	Lot	1	$ 5,000	$ 5,000		
Rock Breaking	Lot	1	$ 150,000	$ 150,000		
Steel Pole Installation	Lot	1	$ 144,220	$ 144,220		
Environmental Remediation Support	Lot	1	$ 10,000	$ 10,000		
			Sub-Total	$ 1,187,371		
Freight Postage Delivery						
Freight	Lot	1	$ 89,129	$ 89,129		
			Sub-Total	$ 89,129		
Consulting						
Surveying	Lot	1	$ 12,640	$ 12,640		
			Sub-Total	$ 12,640		
Other Goods & Services						
Contingency	%	15%	$ 1,956,315	$ 293,447		
			Sub-Total	$ 293,447		
AFUDC Interest						
AFUDC Interest				$ 1,826		
			Sub-Total	$ 1,826		
Vehicle Overhead						
Vehicle AO		1	$ 25,879	$ 25,879		
			Sub-Total	$ 25,879		
Administrative Overhead						
Labour AO		1	$ 29,315	$ 29,315		
Contract AO		1	$ 171,754	$ 171,754		
			Sub-Total	$ 201,069		
			SUB-TOTAL (no AO, AFUDC)	$ 2,249,763		
			TOTAL (AO, AFUDC included)	$ 2,478,537		
Original Cost				$ 85,196		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Document No: XXX-XX-XXXX-XXXX

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: L-5004 Kearney Lake Structure Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Preliminary (P)	NR	NR	P	P	
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Preliminary (P)	NR	P			
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Preliminary (P)	NR	P			
Risk Register	Preliminary (P)	NR	P			
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
H. Studies						
Routing Options	Defined (D)	P	P	D	D	D
Topography & Bathymetry	Defined (D)	P	P	P/D	D	D
Environmental Impact/Sustainablity Assessment	Defined (D)	NR	P	D	D	D
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic / Subsea	Defined (D)	NR	P	D	D	D
Soils & Hydrology	Defined (D)	NR	P	D	D	D
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Complete (C)	S	P	C	C	C
Foundation / Structure (Tower) Design	Preliminary (P)	S	P			
Route Mapping / Survey	Complete (C)	S/P	P/C	C	C	C
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Started (S)	NR	S/P			
Geometric Layout, Alignment, Profile, Cross Section	Complete (C)	NR	S/P	P/C	C	C
Land / ROW Title Negotiation	Complete (C)	NR	S/P	P/C	C	C
Civil / Site / Structural / Architectural Discipline Drawings	Preliminary (P)	NR	S/P	P		
Crossings and Borings Designs and Drawings	Complete (C)	NR	S/P	P	C	C
Demolition Plans and Drawings	Started (S)	NR	S/P			
Erosion Control Plan & Drawings	Started (S)	NR	S/P			
Foundation / Structure (Tower) Discipline Drawings	Preliminary (P)	NR	S/P	P		
Tower / Structure Location / Spotting	Complete (C)	NR	S/P	P	C	C
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Complete (C)	NR	NR	S/P	P/C	C
Instrumentation / Control System Discipline Drawings	Complete (C)	NR	NR	S/P	P/C	C
	Total # Deliverables for this Project	10	35	30	26	25
	% Defined/Complete towards Class Estimate	100%	100%	79%	68%	66%

Comments:

This project is being submitted as an AACE Class 3 estimate. The deliverables of this project indicate that 79% of the Class 3 deliverables have been completed. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. Previous line replacement and upgrade projects have utulized 10% contingency on all estimated costs, due to the projects being similar, a 15% contingency has been applied. Contingency is intended to to account for risks associated with additional overtime work that may be required to complete the project within the available outage window, and any unforeseen material or contract cost increases.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route, the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0069238

Title: 2025/2026 Steel Tower Refurbishment

Start Date: 2025/02
In-Service Date: 2025/02
Final Cost Date: 2027/06
Function: Transmission
Forecast Amount: $2,337,250

DESCRIPTION:

This project is required to replace deteriorated steel tower components. NS Power has approximately 2,000 steel towers installed on the transmission system. The deteriorated steel tower components are identified through the NS Power transmission inspection program. Components that will be replaced include hardware, guy wires, tower legs and grillages, footings, and steel members.

The age profile of the steel tower assets is detailed in the table below:

Age Range	Kilometers of Transmission Line	% of Steel Structures
0-10	0	0%
11-20	0	0%
21-30	219	31%
31-40	170	24%
41-50	164	23%
51-55	37	5%
55+	126	17%

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2023 CI C0050835 2023/2024 Steel Tower Refurbishment $1,908,347
- 2027 CI TBD – 2027/2028 Steel Tower Refurbishment $TBD

Depreciation Class: Transmission Plant – Towers and Fixtures
Transmission Plant – Roads, Trails and Bridges

Estimated Useful Life:50-55 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.31%

JUSTIFICATION:

Justification Criteria: Transmission

Why do this project?

NS Power's transmission inspection program has identified deteriorated components on steel towers that require replacement. The lines carried by these transmission towers are critical to the reliable operation of NS Power's transmission system. Work on these deficiencies will be prioritized based on inspection results, engineering assessments and the overall line criticality, which is driven by safety, environmental, and reliability considerations,

remaining consistent with how work has been completed under this program in the past. The exact towers that will be refurbished under this project will be determined throughout the prioritization process associated with this program.

Why do this project now?

This work included in this project is based on transmission inspection results and will be prioritized based on specialized structural steel inspections. Many of the components throughout NS Power's steel tower inventory have reached the end of their expected service lives and if replacements are not completed, the safety, reliability, and serviceability of the associated transmission lines will be compromised.

This project is deemed in-service when the first tower is completed (forecast to be February 2025), therefore the Final Cost Date (June 2027) is listed as six months after the last tower is forecast to be completed (December 2026).

Why do this project this way?

Replacing the existing deteriorated steel tower components in this targeted manner will support the continued reliable operations of the transmission system and is more cost effective than entire steel tower replacements.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) and previous experience with steel tower refurbishment projects, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as an AACE Class 3 estimate with a contingency value appropriate to that range. NS Power completes multiple transmission line structure repairs, replacements and upgrades with varying levels of complexity annually, based on recommendations from contractors, field leads, and qualified inspectors. These prior projects have experienced cost pressures in the 8-15% range above the budgeted estimates. Therefore, based on these past similar projects, a contingency of 10% remains appropriate for this project.

CI Number : C0069238 - 2025/2026 Steel Tower Refurbishment

Project Number C0069238

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General

Budget Version 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	2600 - TP - Rds,Trls.Brdgs.	176,810
Additions	3700 - TP - Steel Towers	1,732,447
Retirements	2600 - TP - Rds,Trls.Brdgs.	90,104
Retirements	3700 - TP - Steel Towers	337,890
	Total Cost:	2,337,250
	Original Cost:	351,643

Capital Project Detailed Estimate

Location: Transmission
CI#: C0069238
Title: 2025/2026 Steel Tower Refurbishment
Execution Year: 2025/2026

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Site Supervision	Lot	60	$ 443	$ 26,500		
T&D Labour - Design	Lot	14	$ 443	$ 6,010		
			Sub-Total	$ 32,510		
Travel Expense						
Travel	Lot	1	$ 3,000	$ 3,000		
			Sub-Total	$ 3,000		
Materials						
Steel Tower Components	Lot	1	$ 403,700	$ 403,700		
			Sub-Total	$ 403,700		
Contracts						
Contract Line Work	Lot	1	$ 1,278,350	$ 1,278,350		
External Supervision	Lot	1	$ 70,000	$ 70,000		
External Civil Design	Lot	1	$ 110,000	$ 110,000		
			Sub-Total	$ 1,458,350		
Meals & Entertainment						
Meals	Lot	1	$ 4,000	$ 4,000		
			Sub-Total	$ 4,000		
Other Goods & Services						
Contingency	%	10%	$ 1,901,560	$ 190,156		
			Sub-Total	$ 190,156		
Vehicle Overhead						
Vehicle AO				$ 16,219		
			Sub-Total	$ 16,219		
Administrative Overhead						
Labour AO				$ 18,409		
Contract AO				$ 210,907		
			Sub-Total	$ 229,316		
			SUB-TOTAL (no AO, AFUDC)	$ 2,091,716		
			TOTAL (AO, AFUDC included)	$ 2,337,250		
Original Cost				$ 351,643		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Document No: XXX-XX-XXXX-XXXX

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 2025/2026 Steel Tower Refurbishment	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Preliminary (P)	NR	P			
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Preliminary (P)	NR	NR	P	P	
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Preliminary (P)	P	P			
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Preliminary (P)	NR	P			
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Preliminary (P)	NR	P			
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
H. Studies						
Routing Options	Preliminary (P)	P	P			
Topography & Bathymetry	Preliminary (P)	P	P	P/D		
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Preliminary (P)	NR	P			
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Not Applicable (NA)					
Foundation / Structure (Tower) Design	Not Applicable (NA)					
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Not Applicable (NA)	NR				
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Not Applicable (NA)	NR				
Geometric Layout, Alignment, Profile, Cross Section	Not Applicable (NA)	NR				
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Not Applicable (NA)	NR				
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Preliminary (P)	NR	S/P	P		
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	7	21	15	11	10
	% Defined/Complete towards Class Estimate	100%	100%	68%	50%	45%

Comments:

The maturity matrix indicates that 68% of deliverables used in compiling a Class 3 estimate have been completed. The scope of work is well understood based on previous program refurbishment and the estimate is considered to have AACE Class 3 accuracy. Past refurbishment projects have included a 10% contingency on estimated costs which will remain consistent with this project. This contingency is intended to cover any unforeseen work or costs that will be required to complete this project within the allotted time frames (when outages are required) depending on the complexity of the refurbishment and availability of material.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0057682

Title: Spare Transformer Replacement

Start Date:	2023/12
In-Service Date:	2025/04
Final Cost Date:	2026/06
Function:	Transmission
Forecast Amount:	$2,286,389

DESCRIPTION:

This project is for the purchase and assembly of a new 7.5/10/12.5 MVA, 69 to 13.2/4.16 kV transformer that will be equipped with an on-load tap changer. This transformer will be stored in the NS Power System Spares Storage Site in Onslow. NS Power determines optimal sparing levels for power transformers and replenishment of this spare aligns with it's sparing strategy.

Summary of Related CIs +/- 2 years
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission projects include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- No other projects in 2023, 2024, 2025, 2026, or 2027.

Depreciation Class: Transmission Plant – Station Equipment

Estimated Life of the Asset: 40 Years

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

The previous system spare power transformer was shipped and put in service at the 6N-Black River Road Subtation in January 2023 due to a lightning-induced failure of the prior transformer. The damaged transformer was not repairable and disposed of, and a spare transformer is required to replenish stock. NS Power's first layer of risk mitigation against unforeseen equipment failure is to supply impacted circuits via alternate distribution feeds or to temporarily deploy a mobile substation which enables faster restoration of service to customers. Following this initial restoration, the failed equipment is replaced, in this case by utilizing the available spare transformer. Replenishing the capital spares inventory with a unit of this size and voltage class will expedite the return to regular service in the event of an unforeseen failure in the future.

Why do this project now?

As noted above, NS Power uses a sparing strategy to determine necessary spare inventory for power transformers and replenishment of this spare will return spare inventory levels to those recommended by NS Power's sparing strategy. This strategy ensures NS Power has a high probability of having a spare transformer available in the event of an unforeseen failure across the fleet of hundreds of power transformers while keeping inventory levels cost-effective. The sparing strategy accounts for the long lead time associated with power transformer purchases as well as the availability of mobile substations to serve in urgent contingency situations. The sparing strategy means that NS Power has options if a similar transformer fails prior to the receipt of the replenishment spare. The longer NS Power goes without restoring capital spare transformer inventory to recommended levels, the higher the likelihood that future failures could occur that stress NS Power's capital spare inventory to a point where available restoration options become highly constrained. With transformer lead times reaching 2 years or more, it is necessary to secure a spare transformer of this size now.

This project is deemed in-service when the transformer is recieved (forecast to be April 2025), therefore the Final Cost Date (June 2026) is listed as six months after the work is forecast to be completed (December 2025).

Why do this project this way?

A spare 7.5/10/12.5 MVA, 69 to 13.2/4.16 kV transformer purchased to meet NS Power's technical specifications and centrally located within Nova Scotia will minimize future interruptions by allowing for a planned, orderly, and cost-effective restoration process. Without the purchase of the spare unit, if a transformer fails it will need to be acquired on an unplanned, emergency basis and lead times could potentially tie up a mobile substation for excessive duration, reducing availability for planned maintenance or other contingency scenarios. This spare transformer can be utilitized for 28 different transformers across the province in the case one of those fails.

Alternatives are considered within the sparing strategy, such as leaving spare transformers in-service at the impacted location or replacing the original transformer and returning the spare unit to inventory. In this case, the spare could be left in-service at the 6N location and the spare inventory must be replenished. Utilizing critical spares allows NS Power to extend the life of transformers while managing asset risks. Without spares, NS Power would be required to replace more transformers than it otherwise would with appropriate spares.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) based on previous line replacement and upgrade experience and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value of 10% appropriate to that range. The risks intended to be covered by the contingency include unexpected delays, such as outage windows, or issues that may arise during the assembly process, which could impact the overall project timeline.

CI Number : C0057682 - Spare Transformer Replacement **Project Number** C0057682

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0300 - TP - Bldg.,Struct.Grnd.	999
Additions	2300 - TP - Power Equip.-Station S	2,211
Additions	4400 - TP - Substn.Transf.	2,283,179
	Total Cost:	2,286,389
	Original Cost:	

Capital Project Detailed Estimate

Location: Transmission
CI#: C0057682
Title: Spare Transformer Replacement
Execution Year: 2024-2026

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Site Supervision	PD	5	$ 418	$ 2,185		
T&D Labour - PLT	PD	8	$ 403	$ 3,186		
Design	PD	155	$ 418	$ 64,841		
			Sub-Total	$ 70,212		
Overtime Labour						
Design	PD	3	$ 418	$ 1,243		
				$ 1,243		
Term Labour						
Design	PD	4	$ 418	$ 1,499		
				$ 1,499		
Term Overtime Labour						
Design	PD	0	$ 418	$ 187		
				$ 187		
Materials						
Power Equip.-Station S	Lot	1	$ 1,000	$ 1,000		
Substation Transformer	Lot	1	$ 1,623,269	$ 1,623,269		
			Sub-Total	$ 1,624,269		
Freight						
Freight	Lot	1	$ 202,759	$ 202,759		
				$ 202,759		
Travel Expense						
Travel Expense	Lot	1	$ 848	$ 885		
			Sub-Total	$ 885		
Contracts						
Substation Transformer	EA	1	$ 68,601	$ 68,601		
			Sub-Total	$ 68,601		
Consulting						
Design	Lot	1	$ 20,250	$ 20,250		
				$ 20,250		
Other Goods & Services						
Contingency	%	10%	$ 1,989,905	$ 199,134		
			Sub-Total	$ 199,134		
AFUDC Interest						
AFUDC Interest				$ 8,909		
			Sub-Total	$ 8,909		
Vehicle Overhead						
Vehicle AO				$ 34,575		
			Sub-Total	$ 34,575		
Administrative Overhead						
Labour AO				$ 43,785		
Contractor AO				$ 10,081		
			Sub-Total	$ 53,866		
			SUB-TOTAL (no AO, AFUDC)	$ 2,189,039		
			TOTAL (AO, AFUDC included)	$ 2,286,389		
Original Cost				$ -		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: Spare Transformer Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Preliminary (P)	NR	P			
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Not Applicable (NA)					
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Not Applicable (NA)					
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Not Applicable (NA)	NR				
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Not Applicable (NA)	NR				
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Not Applicable (NA)					
Foundation / Structure (Tower) Design	Not Applicable (NA)					
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Complete (C)	NR	S/P	C	C	C
Construction Permits	Not Applicable (NA)	NR				
Geometric Layout, Alignment, Profile, Cross Section	Complete (C)	NR	S/P	P/C	C	C
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Preliminary (P)	NR	S/P	P		
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Complete (C)	NR	NR/S	P	P/C	C
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Complete (C)	NR	NR	S/P	P/C	C
	Total # Deliverables for this Project	3	14	16	13	13
	% Defined/Complete towards Class Estimate	100%	100%	94%	76%	76%

Comments:

This project is being submitted as an AACE Class 3 estimate, with approximately 94% of the deliverables defined and completed. According to AACE guidelines, a contingency value between 10% and 30% is recommended for Class 3 projects. Based on the contingency used in similar past projects, a 10% contingency has been applied here.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0050852

Title: 10V-T1 Transformer Replacement

Start Date: 2024/02
In-Service Date: 2025/12
Final Cost Date: 2026/06
Function: Transmission
Forecast Amount: $2,113,337

DESCRIPTION:

This project is for the replacement of the 10V-T1 transformer, which is a 69-6.9 kV step-up transformer with a capacity of 8 MVA, used to convert voltage from the Nictaux Falls Hydro Generating Station onto the transmission line L-5025.

This transformer was originally commissioned in 1953 and is approaching the end of useful life. The unit's deteriorating condition, including oil leaking issues, must be addressed to reliably maintain connection of the generating station to the transmission grid. With a Risk Threshold Criticality score of 3, and the existing deteriorating condition, it was determined that this transformer needs to be replaced. In addition to the new transformer, modifications to the oil containment pad and valving are required to accommodate a larger, in volume, transformer.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission projects include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- No other projects in 2023, 2024, 2025, 2026 or 2027

Depreciation Class: Transmission Plant – Station Equipment
Transmission Plant – Overhead Conductors and Devices

Estimated Life of the Asset: 40 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.1%

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

10 V-T1 has been in-service for 71 years and requires significant attention for managing oil weeps and leaks, as a result of the significant degradation of its tank over time. Repairs have been made to address the leaks, but the leaks are expected to persist as long as this transformer remains in service. The transformer has surpassed the end of its useful life and replacing it will ensure more reliable performance and mitigate any environmental risks associated with the present transformer. The issues that have occurred will continue if the transformer is not replaced. The new transformer will be larger than the existing transformer and modifications to the oil containment pad is required to hold a larger volume of oil in case all oil drains unexpectedly. This is to ensure that all oil is contained and does not impose environmental risks on the nearby watercourse.

Why do this project now?

Due to its deteriorated condition, the transformer replacement is required at this time. If left in its current state, it will continue to deteriorate, necessitating increasingly frequent callouts for substation personnel to manage oil weeps and leaks. During this down time, the hydro generation station is unable to provide renewable energy to the grid, thus it is necessary to replace the transformer to reduce generation downtime.

Why do this project this way?

The advanced age of the transformer makes refurbishment impractical as all critical components of the unit are equally aged and unavailable from the OEM. Refurbishment would not be possible on a unit of this age as it can potentially cause other issues such as gassing which would add to the frequent maintenance issues. Given that this transformer is the only connection between the hydro plant and the provincial transmission system, refurbishing the transformer is not a viable option. Therefore, replacing the transformer is required to ensure continued, reliable power generation and to avoid the risks associated with its current state. With the transformer's proximity to the river, it is critical to use an engineered oil containment pad to safely capture oil in the event all oil is drained unexpectedly. The containment pad is the best solution to ensure the volume of oil is contained and eliminates the risk of leaking into the river.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers and field personnel) based on previous transformer replacement projects experience and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed with a contingency value of 10 percent, which is appropriate for a Class 3 estimate. Risks intended to be covered by this contingency are primarily related to unforeseen material and contract cost increases, and complications during execution, such as environmental issues, schedule setbacks, and unforeseen overtime work to meet project schedule.

CI Number : C0050852 - 10V-T1 Transformer Replacement **Project Number** C0050852

Parent CI Number : -

Asset Location : 1455 - 1455 Transmission Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0300 - TP - Bldg.,Struct.Grnd.	98,251
Additions	0700 - TP - Environmental	97,850
Additions	3900 - TP - O/H Cond.	17,526
Additions	4400 - TP - Substn.Transf.	1,754,661
Retirements	4400 - TP - Substn.Transf.	145,049
	Total Cost:	2,113,337
	Original Cost:	162,050

Location: Transmission
CI#: C0050852
Title: 10V-T1 Transformer Replacement
Execution Year: 2024-2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Site Supervision	PD	42	$ 418	$ 17,483		
T&D Labour - PLT	PD	27	$ 403	$ 11,005		
Design	PD	215	$ 418	$ 89,856		
Commissioning	PD	66	$ 418	$ 27,640		
			Sub-Total	$ 145,984		
Materials						
Bldg.,Struct.Grnd.	Lot	1	$ 4,938	$ 4,938		
Substn.Transf.	Lot	1	$ 1,039,033	$ 1,039,033		
Spare Bushings	Lot	3	$ 16,780	$ 50,340		
Environmental	Lot	1	$ 23,850	$ 23,850		
O/H Conduc	Lot	1	$ 7,500	$ 7,500		
			Sub-Total	$ 1,125,661		
Freight						
Freight	Lot	1	$ 144,828	$ 144,828		
				$ 144,828		
Travel Expense						
Travel Expense	Lot	1	$ 4,650	$ 4,650		
			Sub-Total	$ 4,650		
Contracts						
Bldg.,Struct.Grnd.	EA	1	$ 57,924	$ 57,924		
Substn.Transf.	EA	1	$ 123,000	$ 123,000		
Environmental	EA	1	$ 74,000	$ 74,000		
Field Supervision	EA	1	$ 15,750	$ 15,750		
			Sub-Total	$ 270,674		
Consulting						
Design	Lot	1	$ 20,250	$ 20,250		
			Sub-Total	$ 20,250		
Other Goods & Services						
Contingency	%	10%	$ 1,712,047	$ 171,205		
			Sub-Total	$ 171,205		
AFUDC Interest						
AFUDC Interest				$ 35,341		
			Sub-Total	$ 35,341		
Vehicle Overhead						
Vehicle AO				$ 72,895		
			Sub-Total	$ 72,895		
Administrative Overhead						
Labour AO				$ 82,704		
Contract AO				$ 39,145		
			Sub-Total	$ 121,849		
			SUB-TOTAL (no AO, AFUDC)	$ 1,883,252		
			TOTAL (AO, AFUDC included)	$ 2,113,337		
Original Cost				$ 162,050		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 10V-T1 Transformer Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Not Applicable (NA)					
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Not Applicable (NA)	NR				
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Not Applicable (NA)	NR				
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Not Applicable (NA)	NR				
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Preliminary (P)	S	P			
Foundation / Structure (Tower) Design	Preliminary (P)	S	P			
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Preliminary (P)	NR	S/P			
Construction Permits	Not Applicable (NA)	NR				
Geometric Layout, Alignment, Profile, Cross Section	Started (S)	NR	S/P			
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Preliminary (P)	NR	S/P	P		
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Preliminary (P)	NR	S/P	P		
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Preliminary (P)	NR	NR	S/P	P/C	
Instrumentation / Control System Discipline Drawings	Started (S)	NR	NR	S/P		
	Total # Deliverables for this Project	6	18	17	14	13
	% Defined/Complete towards Class Estimate	100%	100%	81%	67%	62%

Comments:

This project is being submitted as an AACE Class 3 estimate, with approximately 81% of the deliverables defined and completed. According to AACE guidelines, a contingency value between 10% and 30% is recommended for Class 3 projects. Based on the contingency used in similar past projects, a 10% contingency has been applied here. This contingency addresses potential execution risks, such as schedule setbacks and unforeseen overtime work needed to meet the project schedule. It also accounts for possible increases in material and contract costs during the project.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0050834

Title: Spare EHV Breaker Replacements

Start Date:	2024/07
In-Service Date:	2025/06
Final Cost Date:	2029/07
Function Class:	Transmission
Forecast Amount:	$1,178,832

DESCRIPTION:

This project is for the procurement of one spare 230 kV circuit breaker and one spare 345 kV circuit breaker. These breakers will be stored as a contingency against failures within NS Power's existing fleet.

This change in strategy is in response to the increasing lead times for high voltage equipment in recent years. Currently, lead times have tripled compared to the past and it is unsustainable to keep a contingency plan in place for 3-5 years for critical pieces. This causes risks to customers and needs to be addressed with a stronger contingency plan.

Based on an analysis of the existing fleet of 230 and 345 kV circuit breakers has determined that having a spare breaker for each is required.

Summary of Related CIs +/- 2 years
Pursuant to Section 11.2 of the CEJC, related CIs for Transmission projects include "Work completed on the same asset class (Pad mount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- CI C0055796 – 2023 EHV Breaker Replacements - $3,405,879

Depreciation Class: Transmission Plant- Station Equipment

Estimated Life of the Asset: 40 Years

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

With approximately 26 percent of the Extra High Voltage (EHV) breaker fleet over 40 years of age and based on the assessed condition of the fleet, it is expected that over the next several years there will be an increased frequency of breaker issues requiring corrective maintenance and/or replacement. At present, NS Power does not have a complete 3 phase 230 kV or 345 kV breaker available in the event of a total failure (meaning not repairable with spare components). Purchasing these two spares will provide appropriate contingency against a total failure for a highly critical asset within the transmission line network. With a spare available, the outage length during a failure would be reduced and restore customers faster.

Why do this project now?

The risk profile for this asset class is rising, primarily due to factors such as age, service history, and the availability of OEM replacement components. Procuring spare units now will allow NS Power to maintain system reliability in the event of a failure and mitigate long lead times on replacement breakers. By proactively managing these risks, NS Power can enhance the overall reliability and performance of its system. This approach not only mitigates potential disruptions but also aligns with the Company's long-term strategy for maintaining a robust and resilient transmission system. Ensuring the timely arrival of these critical components is essential for sustaining operational efficiency and minimizing downtime.

This project is deemed in-service when the first spare breaker arrives (forecast to be June 2025), therefore the Final Cost Date (July 2029) is listed as six months after the last spare breaker is forecast to arrive (January 2029).

Why do this project this way?

Given the challenges posed by obsolescence and the limited availability of spare parts, having fully assembled spare EHV breakers is required for a reliable electrical utility system. While alternative options include repurposing circuit breakers from other capital projects, this approach would cause delays and is not ideal. In the event of failure, addressing the issues without a spare would cause difficulties with OEM support and spare parts to repair in a timely manner and puts customers at risk. By having ready-to-install spares, NS Power can minimize downtime and ensure the continued reliability of the system.

Contingency Statement

Contingency for this project was determined using a combination of internal subject matter expert judgment based on previous switch and breaker replacement experience, current supplier arrangements, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 1 estimate. However, based on the current agreement with the supplier, the supplier may modify pricing based on escalation at the time of delivery; the anticipated escalation from the order date to the expected shipping date (from 2024 to 2029) for the 345 kV circuit breaker is 18.5 percent. To address potential inflationary increases, a 20 percent contingency for this project was deemed appropriate. Notably, one breaker is expected to arrive in 2025, while another is scheduled for 2029.

CI Number	: C0050834	- Spare EHV Breaker Replacements	**Project Number**	C0050834
Parent CI Number	:	-		
Asset Location	: 1455	- 1455 Transmission Plant General	**Budget Version**	2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	4300 - TP - Substn Dev.	1,178,832
	Total Cost:	1,178,832
	Original Cost:	

Location: Transmission
CI#: C0050834
Title: Spare EHV Breaker Replacements
Execution Year: 2025-2029

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
Design	PD	59	$ 418	$ 24,605		
			Sub-Total	$ 24,605		
Materials						
Circuit Breakers	Lot	1	$ 695,741	$ 695,741		
USD Exchange	%	36%	$ 252,658	$ 252,658		
			Sub-Total	$ 948,399		
Other Goods & Services						
Contingency (Material)	%	20%	$ 948,399	$ 189,680		
			Sub-Total	$ 189,680		
AFUDC Interest						
AFUDC Interest				$ 2,215		
			Sub-Total	$ 2,215		
Administrative Overhead						
Labour AO				$ 13,933		
			Sub-Total	$ 13,933		
			SUB-TOTAL (no AO, AFUDC)	$ 1,162,684		
			TOTAL (AO, AFUDC included)	$ 1,178,832		
Original Cost						

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: CI C0050834 - Spare EHV Breakers	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Not Applicable (NA)	NR				
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable	Not Applicable (NA)					
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Not Applicable (NA)	NR	NR			
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Not Applicable (NA)					
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Not Applicable (NA)					
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Not Applicable (NA)	NR				
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Not Applicable (NA)	NR				
Start-up & Commissioning Plan	Not Applicable (NA)	NR				
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Not Applicable (NA)	NR				
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Not Applicable (NA)					
Foundation / Structure (Tower) Design	Not Applicable (NA)					
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Complete (C)	NR	S/P	C	C	C
Construction Permits	Not Applicable (NA)	NR				
Geometric Layout, Alignment, Profile, Cross Section	Complete (C)	NR	S/P	P/C	C	C
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Not Applicable (NA)	NR				
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	3	11	11	11	11
	% Defined/Complete towards Class Estimate	100%	100%	100%	100%	100%

Comments:

This project is being submitted as an AACE Class 1 estimate, with all deliverables clearly defined and completed. As this pertains to a spare breaker project, the breakers have already been specified and approved, meaning no additional work is required beyond receiving and storing them until they are needed. Based on the current agreement with the supplier, the supplier may modify pricing based on escalation at the time of delivery.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: CI C0068952

Title: 2025 PCB Poletop Sampling and Replacement

Start Date: 2024/11
In-Service Date: 2024/11
Final Cost Date: 2026/12
Function: Distribution
Forecast Amount: $7,158,974

DESCRIPTION:

This project provides for the systematic sampling, removal, and replacement of pole-top transformers containing or identified as potentially containing polychlorinated biphenyl (PCB) materials in accordance with federal regulations. Regulations state that all oil-filled equipment with PCBs in a concentration greater than or equal to 50 mg/kg must be removed from service by December 31, 2025. The project scope includes sampling approximately 1,800 of these poletop transformers and replacing approximately 635 of them. This project will be completed over 14 months.

A portion of the capital costs associated with this capital item will contribute toward settling the Company's Asset Retirement Obligation for PCB contaminated oil.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Distribution include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2023 - CI C0054995 2023 Inaccessible PCB Transformer Replacements – $846,422
- 2024 - CI C0071248 2024 PCB Poletop Sampling and Replacement - $978,709
- 2025 - CI C0068954 2025 PCB Downline Device Sampling and Replacement - $1,716,718
- 2025 - CI C0068953- 2025 PCB Light Replacement - $4,225,224

Depreciation Class: Distribution Plant - Poles, Towers and Fixtures
Distribution Plant - Line Transformers

Estimated Useful Life: 30-40 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.1%

JUSTIFICATION:

Justification Criteria: Environment

Why do this project?

Environment and Climate Change Canada (ECCC) has committed to a policy of phasing out the use of PCBs in Canada. In support of this policy, NS Power is focused on eliminating all oil-filled electrical equipment containing PCBs in a concentration greater than or equal to 50 mg/kg before December 31, 2025, as required by the PCB Regulation SOR/2008-273.

Why do this project now?

Work must be completed prior to December 31, 2025 to be compliant with the regulation. There could be environmental regulation non-compliance and reliability implications if these assets fail prematurely; thus, it is prudent to replace these assets now. This work is being completed with a mixture of NS Power's existing work plan and resources as well as contractor resources.

This project is deemed in-service when the first pole top transformer is replaced (forecast to be November 2024), therefore the Final Cost Date (December 2026) is listed as six months after the last pole top transformer is forecast to be completed (June 2026).

Why do this project this way?

This project concludes the sampling and replacing of PCB contaminated pole-top transformers. This project will be used to address the final poletop transformers requiring sampling, investigation, or replacement under the PCB regulations in geographical area across the province and will allow NS Power to address it in the manner that provides the least time, resources, and disruption to customer property.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers, project managers, and field personnel), previous experience with PCB pole-top transformer replacement projects, and the non-binding contingency guidelines. Consistent with the maturity checklist this project is being filed as an AACE Class 3 estimate with a contingency value appropriate to that range. NS Power's inspection programs (feeder inspections) are still identifying assets which need to be addressed under this program. Therefore, a contingency of 20% has been applied as additional transformers that require addressing under the PCB Regulations may be identified prior to the completion of this project. Other risks intended to be covered by the contingency include difficult to access transformers requiring additional employee overtime, additional tree trimming, and deteriorated associated equipment such as poletop cutouts that may also require replacement.

CI Number : C0068952 - 2025 PCB Poletop Sampling and Replacement **Project Number** C0068952

Parent CI Number : -

Asset Location : 1456 - 1456 Distribution Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	3500 - DP - Wood Poles	616,818
Additions	4100 - DP - O/H Line Transf.	4,033,041
Additions	4200 - DP - O/H Ln.Transf.Dev.	94,895
Retirements	3500 - DP - Wood Poles	313,849
Retirements	4100 - DP - O/H Line Transf.	2,052,087
Retirements	4200 - DP - O/H Ln.Transf.Dev.	48,284
	Total Cost:	7,158,974
	Original Cost:	1,650,987

Capital Project Detailed Estimate

Location: Distribution
CI# : C0068952
Title: 2025 PCB Poletop Sampling and Replacement
Execution Year: 2024-2026

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
PLT	PD	876	$ 427	$ 374,400		
Engineering	PD	106	$ 443	$ 46,800		
Planner	PD	248	$ 383	$ 95,160		
Storekeeper	PD	56	$ 388	$ 21,632		
Utility worker	PD	85	$ 383	$ 32,448		
			Sub-Total	$ 570,440		
OT Labour						
PLT	PD	88	$ 855	$ 74,880		
Storekeeper	PD	56	$ 777	$ 43,264		
				$ -		
			Sub-Total	$ 118,144		
Travel Expense						
Accommodations	lot	1	$ 4,000	$ 4,000		
Mileage	lot	1	$ 6,000	$ 6,000		
			Sub-Total	$ 10,000		
Materials						
Poletop transformers with dressings	lot	1	$ 1,714,500	$ 1,714,500		
Pole with anchoring and dressing	lot	1	$ 270,000	$ 270,000		
Rivets	lot	1	$ 85,000	$ 85,000		
Misc. consumables	lot	1	$ 9,015	$ 9,015		
Transformer hoist and pulley system, pulley cart, matting	lot	1	$ 30,000	$ 30,000		
				$ -		
			Sub-Total	$ 2,108,515		
Contracts						
Traffic Control	lot	1	$ 150,000	$ 150,000		
Aevitas (PCB disposal)	lot	1	$ 250,000	$ 250,000		
Tree cutting	lot	1	$ 200,000	$ 200,000		
Crane	lot	1	$ 435,200	$ 435,200		
External PLT (CAUS)	lot	1	$ 1,008,000	$ 1,008,000		
Additional Poletop Deliveries	lot	1	$ 48,000	$ 48,000		
Stark (poletop management and disposal).	lot	1	$ 150,000	$ 150,000		
			Sub-Total	$ 2,241,200		
Consulting						
Sample Processing	lot	1	$ 81,500	$ 81,500		
				$ -		
			Sub-Total	$ 81,500		
Meals & Entertainment						
Meals			$ 4,000	$ 4,000		
				$ -		
			Sub-Total	$ 4,000		
Other Goods & Services						
Contingency	%	20%	$ 5,133,799	$ 1,026,760		
			Sub-Total	$ 1,026,760		
Vehicle Overhead						
Vehicle Labour AO				$ 315,280		
			Sub-Total	$ 315,280		
Administrative Overhead						
Labour AO				$ 357,197		
Contractor AO				$ 325,938		
			Sub-Total	$ 683,135		
			SUB-TOTAL (no AO, AFUDC)	$ 6,160,559		
			TOTAL (AO, AFUDC included)	$ 7,158,974		
Original Cost				$ 1,650,987		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 2025 PCB Poletop Sampling and Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Preliminary (P)	P	P			
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Not Applicable (NA)					
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Defined (D)	NR	P	D	D	D
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Routing Options	Defined (D)	P	P	D	D	D
Topography & Bathymetry	Defined (D)	P	P	P/D	D	D
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Not Applicable (NA)					
Foundation / Structure (Tower) Design	Not Applicable (NA)					
Route Mapping / Survey	Complete (C)	S/P	P/C	C	C	C
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Complete (C)	NR	S/P	P/C	C	C
Geometric Layout, Alignment, Profile, Cross Section	Not Applicable (NA)	NR				
Land / ROW Title Negotiation	Complete (C)	NR	S/P	P/C	C	C
Civil / Site / Structural / Architectural Discipline Drawings	Not Applicable (NA)	NR				
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Complete (C)	NR	S/P	P	C	C
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	7	23	23	23	23
	% Defined/Complete towards Class Estimate	100%	100%	96%	96%	96%

Comments:

This project is being filed as an AACE Class 3 estimate. The deliverables of this project indicate that 96% of the Class 3 deliverables have been completed with minor exceptions in non-critical areas. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. This project fulfills a regulatory requirement for poletop assets to be assessed for PCBs and removed from service if they cross the regulatory threshold of containing more than 50 ppm PCB. NS Power's inspection programs (feeder inspections) are still identifying assets which may need to be addressed under this program and it is possible for the scope of work to require increasing in order to meet the regulatory requirement. Therefore, a contingency of 20% is considered appropriate.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
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- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route, the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0068953

Title: 2025 PCB Light Replacement

Start Date: 2025/04
In-Service Date: 2025/04
Final Cost Date: 2026/06
Function: Distribution
Forecast Amount: $4,225,224

DESCRIPTION:

This project provides for the replacement of area lights, NS Power owned lights on private property, that are PCB-contaminated or potentially PCB-contaminated. These assets include the remaining Mercury Vapor and Metal Halide lights in-service on NS Power customers' properties. This project provides for the replacement of approximately 3,000 of these devices. Per Federal regulations, NS Power must remove all oil-filled equipment with polychlorinated biphenyl (PCB) concentrations greater than or equal to 50 mg/kg by December 31, 2025.

A portion of the capital costs associated with this capital item will contribute toward settling the Company's Asset Retirement Obligation for PCB contaminated oil.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Distribution include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2023 - CI C0054995 2023 Inaccessible PCB Transformer Replacements - $846,422
- 2024 - CI C0071248 2024 PCB Poletop Sampling and Replacement - $978,709
- 2025 - CI C0068952 2025 PCB Poletop Sampling and Replacements - $7,158,974
- 2025 - CI C0068954 2025 PCB Potential Downline Device - $1,716,718

Depreciation Class: Distribution Plant – Street Lighting and Signal Systems

Estimated Useful Life: 20 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 4.2%

JUSTIFICATION:

Justification Criteria: Environment

Why do this project?

Environment and Climate Change Canada (ECCC) has committed to a policy of phasing out the use of PCBs in Canada. In support of this policy, NS Power is focused on eliminating all oil-filled electrical equipment containing PCBs in a concentration greater than or equal to 50 mg/kg before December 31, 2025, as required by the PCB Regulation SOR/2008-273.

Why do this project now?

Work must be completed prior to December 31, 2025 to be compliant with the regulation. Leaving these assets in service beyond the regulated phase-out date would result in environmental regulation non-compliance. This work is being completed with a mixture of NS Power's existing work plan and resources as well as contractor resources.

This project is deemed in-service when the first device is replaced (forecast to be April 2025), therefore the Final Cost Date (June 2026) is listed as six months after the last device is forecast to be completed (December 2025).

Why do this project this way?

This project will be used to address the remaining PCB potential area lights in-service belonging to NS Power to confirm compliance with the PCB Regulations. Streetlights were phased out December 2019 due to Nova Scotia's *Energy-efficient Appliances Regulations* under CI 40320 – LED Streetlight Conversion. Area lights did fall under the scope of requiring replacement under the LED streetlight Conversion project due to their location. Work will be completed across the province and will allow NS Power to address it in the manner that provides the least time, resources, and disruption to customer property.

These assets cannot be sampled as the PCBs are contained in a sealed capacitor within the light fixture. To extract PCB material from the capacitor for sampling purposes the capacitor would be made inoperable.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers, project managers, and field personnel), previous experience with light replacement projects, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as an AACE Class 3 estimate with a contingency value appropriate to that range. A 10% contingency has been applied to this project. Risks intended to be covered by contingency include complications in some difficult to access replacements associated with this project, such as customer gating, and off-road lights not accessible by a bucket truck, which could lead to a higher level of effort to replace those specific assets.

CI Number : C0068953 - 2025 PCB Potential Light Replacement **Project Number** C0068953

Parent CI Number : -

Asset Location : 1456 - 1456 Distribution Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	9000 - DP - LED Street Lights	3,237,889
Retirements	5000 - DP - Street Lights	987,336
	Total Cost:	4,225,224
	Original Cost:	820,479

Capital Project Detailed Estimate

Location: Distribution
CI# : C0068953
Title: 2025 PCB Light Replacement
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
PLT	PD	876	$ 427	$ 374,400		
Engineering	PD	106	$ 443	$ 46,800		
Planner	PD	27	$ 383	$ 10,400		
Storekeeper	PD	14	$ 383	$ 5,200		
Utility worker	PD	84	$ 388	$ 32,448		
			Sub-Total	$ 469,248		
OT Labour						
PLT	PD	88	$ 855	$ 74,880		
Storekeeper	PD	14	$ 766	$ 10,400		
			Sub-Total	$ 85,280		
Travel Expense						
Accommodations	lot	1	$ 2,000	$ 2,000		
Mileage	lot	1	$ 3,000	$ 3,000		
			Sub-Total	$ 5,000		
Materials						
Lights	lot	1	$ 1,800,000	$ 1,800,000		
Service Pole with anchoring and dressing	lot	1	$ 50,000	$ 50,000		
Misc. consumables	lot	1	$ 75,000	$ 75,000		
			Sub-Total	$ 1,925,000		
Contracts						
Traffic Control	lot	1	$ 80,000	$ 80,000		
Aevitas (PCB disposal)	lot	1	$ 50,000	$ 50,000		
Tree cutting	lot	1	$ 10,000	$ 10,000		
Crane	lot	1	$ 10,000	$ 10,000		
External PLT (CAUS)	lot	1	$ 600,000	$ 600,000		
Pole setting /remediation contractor	lot	1	$ 10,000	$ 10,000		
			Sub-Total	$ 760,000		
Meals & Entertainment						
Meals	lot	1	$ 1,000	$ 1,000		
				$ -		
			Sub-Total	$ 1,000		
Other Goods & Services						
Contingency	%	10%	$ 3,245,528	$ 324,553		
			Sub-Total	$ 324,553		
Vehicle Overhead						
Vehicle Labour AO				$ 255,371		
			Sub-Total	$ 255,371		
Administrative Overhead						
Labour AO				$ 289,862		
Contractor AO				$ 109,911		
			Sub-Total	$ 399,773		
			SUB-TOTAL (no AO, AFUDC)	$ 3,570,081		
			TOTAL (AO, AFUDC included)	$ 4,225,224		
Original Cost				$ 820,479		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 2025 PCB Light Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Preliminary (P)	P	P			
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Not Applicable (NA)					
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Defined (D)	NR	P	D	D	D
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Defined (D)	P	P	P/D	D	D
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Not Applicable (NA)					
Foundation / Structure (Tower) Design	Not Applicable (NA)					
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Not Applicable (NA)	NR				
Construction Permits	Complete (C)	NR	S/P	P/C	C	C
Geometric Layout, Alignment, Profile, Cross Section	Not Applicable (NA)	NR				
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Not Applicable (NA)	NR				
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	5	19	19	19	19
	% Defined/Complete towards Class Estimate	100%	100%	95%	95%	95%

Comments:

This project is being filed as an AACE Class 3 estimate. The deliverables of this project indicate that 95% of the Class 3 deliverables have been completed with minor exceptions in non-critical areas. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project. This project fulfills a regulatory requirement for the replacement of PCB potential area lights that may contain PCBs in concentrations greater than 50 ppm.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0068954

Title: 2025 PCB Downline Device Sampling and Replacement

Start Date: 2025/04
In-Service Date: 2025/04
Final Cost Date: 2026/12
Function: Distribution
Forecast Amount: $1,716,718

DESCRIPTION:

This project provides for the sampling and replacement of downline assets that are PCB-contaminated or potentially PCB-contaminated. These assets include, but are not necessarily limited to, downline primary metering tanks, step-down transformers, voltage regulators. This project provides for the sampling of approximately 160 devices and the replacement of approximately 39 of them. Per Federal regulations, NS Power must remove all oil-filled equipment with polychlorinated biphenyl (PCB) concentrations greater than or equal to 50 mg/kg by December 31, 2025.

A portion of the capital costs associated with this capital item will contribute toward settling the Company's Asset Retirement Obligation for PCB contaminated oil.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Distribution include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2023 - CI C0054995 2023 Inaccessible PCB Transformer Replacements - $846,422
- 2024 - CI C0071248 2024 PCB Poletop Sampling and Replacement - $978,709
- 2025 - CI C0068952 2025 PCB Poletop Sampling and Replacement - $7,158,974
- 2025 - CI C0068953- 2025 PCB Light Replacement - $4,225,224

Depreciation Class: Distribution Plant – Poles, Towers and Fixtures
Distribution Plant – Meters
Distribution Plant – Line Transformers

Estimated Useful Life: 30-40 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.04%

JUSTIFICATION:

Justification Criteria: Environment

Why do this project?

Environment and Climate Change Canada (ECCC) has committed to a policy of phasing out the use of PCBs in Canada. In support of this policy, NS Power is focused on eliminating all oil-filled electrical equipment containing PCBs in a concentration greater than or equal to 50 mg/kg before December 31, 2025, as required by the PCB Regulation SOR/2008-273.

Why do this project now?

Work must be completed prior to December 31, 2025 to be compliant with the regulation. There could be environmental regulation non-compliance and reliability implications if these assets fail prematurely; thus, it is prudent to replace these assets now.

This project is deemed in-service when the first device is replaced (forecast to be April 2025), therefore the Final Cost Date (December 2026) is listed as six months after the last device is forecast to be completed (June 2026).

Why do this project this way?

This project includes the sampling and replacing of PCB contaminated downline devices. This project will be used to address devices that require sampling, investigation, or replacement under the PCB regulations across the province and will allow NS Power to address it in the manner that provides the least time, resources, and disruption to customers.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment (professional engineers, project managers and field personnel), previous experience with PCB downline device replacement projects including 2020 - CI C0016183 2020 Downline Asset PCB Replacements, 2021 - CI C0031166 2021 Downline Asset PCB Replacements, and CI C0043490 2022 Downline Asset PCB Replacements, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as an AACE Class 3 estimate with a contingency value appropriate to that range. A 10% contingency has been applied to this project. Risks intended to be covered by the contingency are overtime work in order to complete the work within an outage window and any unforeseen material or contract cost increases.

CI Number : C0068954 - 2025 PCB Program - Downline Assets **Project Number** C0068954

Parent CI Number : -

Asset Location : 1456 - 1456 Distribution Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	3500 - DP - Wood Poles	106,203
Additions	4100 - DP - O/H Line Transf.	438,090
Additions	4200 - DP - O/H Ln.Transf.Dev.	345,162
Additions	5100 - DP - Meters	438,090
Retirements	3500 - DP - Wood Poles	31,134
Retirements	4100 - DP - O/H Line Transf.	128,427
Retirements	4200 - DP - O/H Ln.Transf.Dev.	101,185
Retirements	5100 - DP - Meters	128,427
	Total Cost:	1,716,718
	Original Cost:	461,933

Capital Project Detailed Estimate

Location: Distribution
CI# : C0068954
Title: 2025 PCB Downline Device Sampling and Replacement
Execution Year: 2025

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
PLT	PD	170	$ 427	$ 72,800		
Engineering	PD	129	$ 443	$ 57,200		
Planner	PD	43	$ 383	$ 16,640		
Storekeeper	PD	13	$ 388	$ 5,200		
Utility worker	PD	37	$ 388	$ 14,560		
Electrician	PD	19	$ 388	$ 7,488		
Metering Service	PD	19	$ 388	$ 7,488		
GIS tech	PD	9	$ 361	$ 3,150		
			Sub-Total	$ 184,526		
OT Labour						
PLT	PD	58	$ 855	$ 49,920		
Storekeeper	PD	16	$ 777	$ 12,480		
Utility Worker	PD	16	$ 777	$ 12,480		
				$ -		
			Sub-Total	$ 74,880		
Travel Expense						
Accommodations	lot	1	$ 2,000	$ 2,000		
Mileage	lot	1	$ 3,000	$ 3,000		
			Sub-Total	$ 5,000		
Materials						
Pole with anchoring and dressing	lot	1	$ 54,000	$ 54,000		
Voltage Regulators	lot	1	$ 126,000	$ 126,000		
Metering Tanks	lot	1	$ 288,000	$ 288,000		
Stepdowns	lot	1	$ 176,000	$ 176,000		
Misc. installation Mat (cable, etc).	lot	1	$ 39,000	$ 39,000		
			Sub-Total	$ 683,000		
Contracts						
Traffic Control	lot	1	$ 50,000	$ 50,000		
Environment Services	lot	1	$ 20,000	$ 20,000		
Tree cutting	lot	1	$ 10,000	$ 10,000		
Crane/boom truck	lot	1	$ 200,000	$ 200,000		
Pole setting /remediation contractor	lot	1	$ 20,000	$ 20,000		
Platform and Support Structure	lot	1	$ 50,000	$ 50,000		
			Sub-Total	$ 350,000		
Meals & Entertainment						
Meals & Tips		1	$ 2,300	$ 2,300		
				$ -		
			Sub-Total	$ 2,300		
Other Goods & Services						
Contingency	%	10%	$ 1,299,706	$ 129,971		
				$ -		
			Sub-Total	$ 129,971		
Vehicle Overhead						
Vehicle Labour AO				$ 110,734		
			Sub-Total	$ 110,734		
Administrative Overhead						
Labour AO				$ 125,690		
Contractor AO				$ 50,617		
			Sub-Total	$ 176,307		
			SUB-TOTAL (no AO, AFUDC)	$ 1,429,677		
			TOTAL (AO, AFUDC included)	$ 1,716,718		
Original Cost				$ 461,933		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 2025 PCB Downline Device Sampling and Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Preliminary (P)	P	P			
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Defined (D)	NR	NR	P	P	D
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Defined (D)	P	P	D	D	D
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Defined (D)	P	P	D	D	D
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Not Applicable (NA)	NR				
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Defined (D)	NR	P	D	D	D
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Routing Options	Defined (D)	P	P	D	D	D
Topography & Bathymetry	Defined (D)	P	P	P/D	D	D
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Not Applicable (NA)					
Foundation / Structure (Tower) Design	Complete (C)	S	P	C	C	C
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Complete (C)	NR	S/P	C	C	C
Construction Permits	Complete (C)	NR	S/P	P/C	C	C
Geometric Layout, Alignment, Profile, Cross Section	Not Applicable (NA)	NR				
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Complete (C)	NR	S/P	P	C	C
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Complete (C)	NR	S/P	P	C	C
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	8	25	25	25	25
	% Defined/Complete towards Class Estimate	100%	100%	96%	96%	96%

Comments:

This project is being filed as an AACE Class 3 estimate. The deliverables of this project indicate that 96% of the Class 3 deliverables have been completed with minor exceptions in non-critical areas. Therefore, AACE recommends that a contingency value of 10% to 30% should be applied to this project.

This project fulfills a regulatory requirement for downline devices (Metering tanks, voltage regulators, stepdown transformers) to be assessed for PCBs and potentially removed from service if the concentration crosses the regulatory threshold of 50 ppm.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
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Technical Deliverables:

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- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route, the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and

CI Number: C0068786

Title: 2025 Padmount Replacement Program

Start Date: 2025/03
In-Service Date: 2025/03
Final Cost Date: 2026/03
Function: Distribution
Forecast Amount: $1,354,219

DESCRIPTION:

This project will replace 50 padmount transformers identified through the padmount inspection program to be at, or near the end of their expected useful life. NS Power has approximately 4,000 padmount transformers in service across its system with their condition assessed through annual inspections. The expected useful life of these assets is between 35-45 years. This is an ongoing replacement program as part of lifecycle and condition management of the in-service distribution padmount transformer inventory.

NS Power anticipates that a portion of the costs associated with this capital item will contribute toward settling the Company's Asset Retirement Obligation for Polychlorinated Biphenyls (PCB) contaminated oil.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Distribution include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- 2023 CI C0050836 2023 Padmount Replacement Program $1,196,779
- 2024 CI C0060749 2024 Padmount Replacement Program $1,288,198
- 2026 CI TBD 2026 Padmount Replacement Program $TBD
- 2027 CI TBD 2027 Padmount Replacement Program $TBD

Depreciation Class: Distribution Plant – Underground Conductors and Devices
Distribution Plant – Line Transformers

Estimated Life of the Asset: 35-45 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.7%

JUSTIFICATION:

Justification Criteria: Distribution System

Why do this project?

Padmount transformer inspections have identified transformers that need to be replaced in 2025 due to their asset condition. Proactive, planned replacement of end of expected useful life padmount transformers mitigates the potential for prolonged, unplanned customer outages due to transformer failure.

This project will also reduce the risk of environmental incidents, as padmount transformer failures can potentially result in an uncontrolled oil release, which is governed by environmental regulations and would result in remediation costs.

Why do this project now?

Padmount transformers at or near the end of useful life are identified through the padmount inspection process and prioritized for replacement. They will be replaced in a planned manner as part of NS Power's reliability and environmental due diligence.

This project is deemed in-service when the first transformer is completed (forecast to be March 2025), therefore the Final Cost Date (March 2026) is listed as six months after the last transformer is forecast to be completed (September 2025).

Why do this project this way?

Padmount transformers are typically used by NS Power to provide service to commercial customers. Planned replacement of padmount transformers that are at or nearing the end of their expected useful life is conducted during an outage coordinated with the customer to mitigate impacts. The planned replacement of these padmount transformers as part of this project will reduce unplanned customer outages and mitigate the potential environmental impact.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment (professional engineers and project managers) and the non-binding contingency guidelines. Consistent with the maturity checklist this project is being filed as a Class 3 Estimate with a contingency value appropriate to that range. Risks intended to be covered by the contingency are additional overtime work that may be required, more deteriorated condition of service wires than expected which may require replacement, or additional tree trimming that may be required to access the padmount. Risks are well understood based on past annual program experience. Similar CIs have been completed each year as part of this program, which included a 10% contingency; therefore, applying the same 10% contingency on this project is considered appropriate.

CI Number : C0068786 - 2025 Padmount Replacement Program **Project Number** C0068786

Parent CI Number : -

Asset Location : 1456 - 1456 Distribution Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	4600 - DP - U/G Conductor	77,138
Additions	4800 - DP - U/G Line Transf.	1,199,932
Retirements	4800 - DP - U/G Line Transf.	77,149
	Total Cost:	1,354,219
	Original Cost:	453,126

Capital Project Detailed Estimate

Location: Distribution
CI# / FP#: C0068786
Title: 2025 Padmount Replacement Program
Execution Year: 2025-2026

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
530050 Regular Labour						
T&D Labour - Design	PD	145	$ 426	$ 61,567		
T&D Labour - PLT	PD	104	$ 395	$ 41,096		
			Sub-Total	$ 102,663		
530200 OT Labour						
T&D Labour - PLT	PD	112	$ 734	$ 82,192		
			Sub-Total	$ 82,192		
531400 Materials						
U/G Conductor	LOT	1	$ 58,405	$ 58,405		
U/G Line Transformer	LOT	1	$ 752,005	$ 752,005		
			Sub-Total	$ 810,410		
531550 Contracts						
U/G Line Transformer	LOT	1	$ 85,411	$ 85,411		
			Sub-Total	$ 85,411		
535100 Other Goods & Services						
Contingency		10%	$ 1,080,676	$ 108,068		
			Sub-Total	$ 108,068		
535650 Vehicle Overhead						
Vehicle AO				$ 71,718		
			Sub-Total	$ 71,718		
535700/535705 Administrative Overhead						
Labour AO				$ 81,405		
Contract AO				$ 12,352		
			Sub-Total	$ 93,757		
			SUB-TOTAL (no AO, AFUDC)	$ 1,188,744		
			TOTAL (AO, AFUDC included)	$ 1,354,219		
Original Cost				$ 453,126		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 2025 Padmount Replacement Program	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Not Applicable (NA)	NR				
B. Capacity						
Voltage (kV) and Circuits	Defined (D)	P	P	D	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Environmental Monitoring	Preliminary (P)	NR	NR	P	P	
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Not Applicable (NA)					
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Not Applicable (NA)					
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Not Applicable (NA)	NR				
Risk Register	Preliminary (P)	NR	P			
Stakeholder Consultation/Engagement/Management Plan	Preliminary (P)	NR	P			
Work Breakdown Structure (WBS)	Defined (D)	NR	P	D	D	D
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainability Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Defined (D)	NR	P	D	D	D
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Preliminary (P)	S	P			
Foundation / Structure (Tower) Design	Complete (C)	S	P	C	C	C
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Preliminary (P)	NR	S/P			
Construction Permits	Not Applicable (NA)	NR				
Geometric Layout, Alignment, Profile, Cross Section	Not Applicable (NA)	NR				
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Not Applicable (NA)	NR				
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation / Structure (Tower) Discipline Drawings	Complete (C)	NR	S/P	P	C	C
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Complete (C)	NR	NR/S	P	P/C	C
Electrical Discipline Drawings	Complete (C)	NR	NR	S/P	P/C	C
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	5	19	17	16	15
	% Defined/Complete towards Class Estimate	100%	100%	77%	73%	68%

Comments:

The maturity matrix indicates that 77% of deliverables used in compiling a Class 3 estimate have been completed. The scope of this work is well understood based on previous program replacements and the estimate is considered to have AACE Class 3 accuracy.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0070787

Title: 91W-411 Labelle Road Phase Extension

Start Date: 2025/04
In-Service Date: 2025/10
Final Cost Date: 2026/10
Function Class: Distribution
Forecast Amount: $1,150,616

DESCRIPTION:

This project will replace the existing single-phase line with a three-phase line for approximately 5.3 kilometers off Highway 210 along Labelle Road to Narrows Road. This project will require the addition of approximately 15.9 kilometers of 336 Aluminum Stranded Primary Conductor (ASC) and 5.3 kilometers of 4/0 Aluminum Alloy Stranded Neutral Conductor (AASC), the replacement of 11 NS Power poles, 36 four service transformers, and the addition of eight new NS Power poles, and a three-phase recloser. Also, a single phase Tripsaver will be relocated from the start of Labelle Road to Narrow's Rd.

Summary of Related CIs +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for Distribution include "Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line)."

- No other related projects in 2023, 2024, 2025, 2026 or 2027

Depreciation Class:
Distribution Plant - Poles, Towers and Fixtures
Distribution Plant - Overhead Conductors and Devices
Distribution Plant - Line Transformers
Distribution Plant - Street Lighting and Signal Systems
Distribution Plant – Services
Distribution Plant – Land Rights – Easements, Surveys and Clearing
Distribution Plant – Station Equipment - Miscellaneous

Estimated Life of the Asset: 45 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 0.01%

JUSTIFICATION:

Justification Criteria: Distribution System

Sub Criteria: Overloaded Equipment

Why do this project?

NS Power is experiencing loading issues on the 91W-411 feeder. Device R4A06139 (a three-phase electronic recloser) is unbalanced with 50.1, 29.6, 12.1 Amps load on A, B, C phases, respectively. Downline recloser RC4A06237, which is located at the beginning of Labelle Road, is loaded with 49.3 Amps. Thus, most of the load is on A phase (Labelle Road) and its single-phase take-offs.

Cold load pickup issues are present on Narrows Road (which is one of Labelle Road's take-offs) where the take-off fuse is loaded with 23.6 Amps. The reported issues are supported by the protection coordination which indicates that the 20T fuse link is the appropriate size to ensure coordination.

The relocation of RC4A06237 to the beginning of Narrows Road will remedy the issue; however, to maintain Waterloo Road's reliability, another three-phase protective device should be installed on Labelle Road. The three-phase protective device will sectionalize the three-phase line extension being proposed and will eliminate cold load pickup

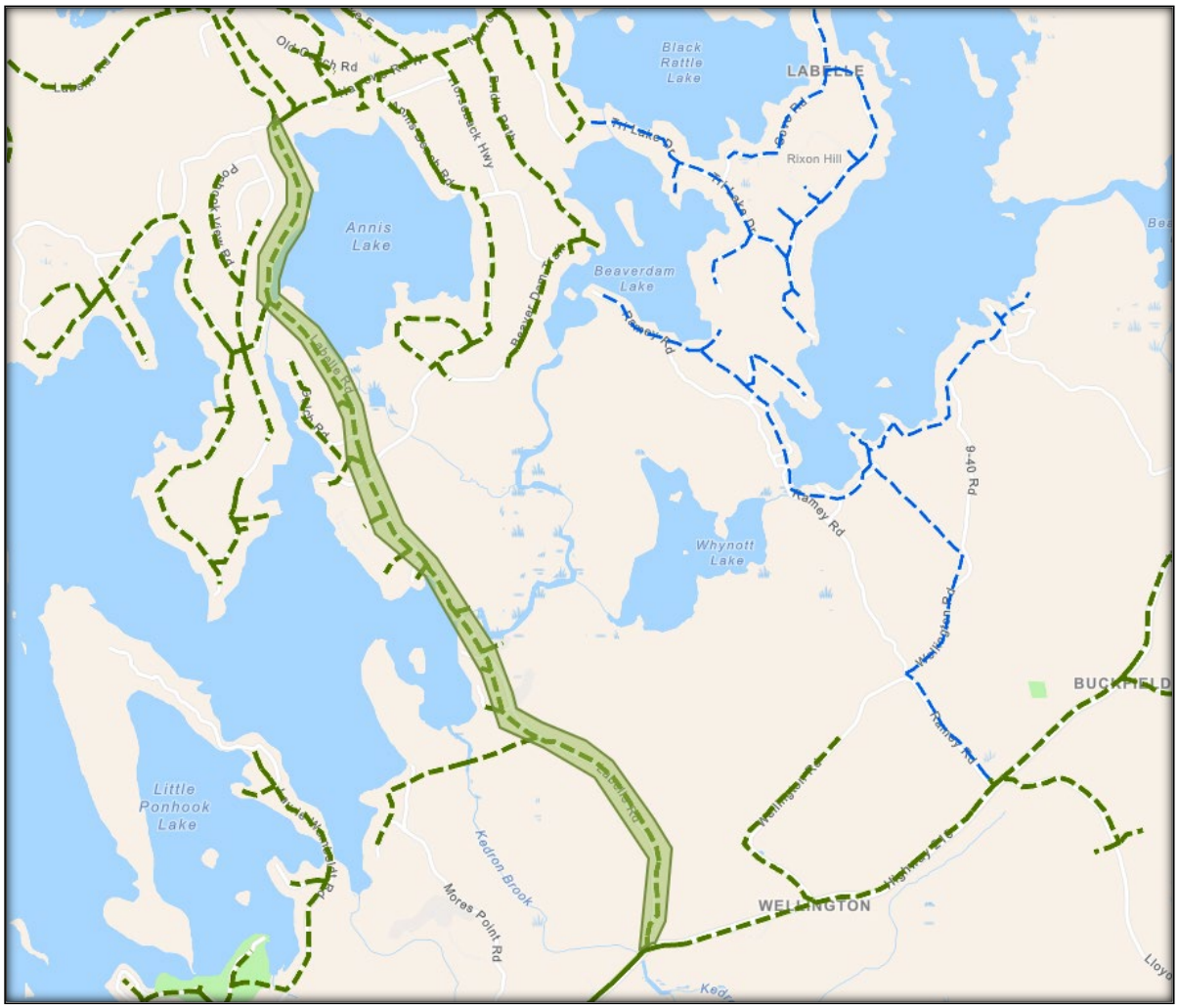
issues also reported on Labelle Road. The proposed extension will reach Narrows Road and will allow NS Power to transfer the 23.6 A to another phase which will balance R4A06139 with an estimated 25.8, 30.0, 35.5 A load on A, B, and C phases, respectively.

Why do this project now?

As discussed in the section above, the cold load pickup issue on Narrows Road and Labelle Road has been reported in the past few years. Based on protection coordination, it is anticipated that this issue will remain. Due to electrification, this issue might become worse. By extending three phase distribution from the start of Labelle Road off highway 210 to Narrows Rd, NS Power will be able to balance the load on Labelle Road and R4A06139 and resolve the issues on this feeder.

Why do this project this way?

Excluding one major three-phase customer on this feeder, one-third of this feeder's load is located on Labelle Road and its load exceeds other single-phase take-offs. Upgrading to a three-phase line in this area will enable the feeder to be better balanced. Moving sections of the line to the roadside will additionally improve the line's accessibility, enabling more efficient line patrols and repair. Both contribute to improving reliability for this section of line. This proposed extension will accommodate cold load pickup issues along with load balancing on R4A06139. It also allows for future load and provides options for balancing the overall feeder.



5.3km of phase extension along Labelle Road.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert judgment (professional engineers and project managers) and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency value appropriate to that range. The 10% contingency is intended to cover potential execution risks related to vegetation management costs, easement costs, resource availability issues and unexpected scope changes. Additionally, it accounts for potential increases in material and contract costs that could arise during the project.

CI Number : C0070787 - 91W-411 Labelle Road Phase Extension **Project Number** C0070787

Parent CI Number : -

Asset Location : 1456 - 1456 Distribution General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	0200 - DP - Land Rights	172,000
Additions	0700 - DP - Environmental	236
Additions	3500 - DP - Wood Poles	470,294
Additions	3900 - DP - O/H Cond.	398,016
Additions	4000 - DP - O/H Cond.Devices	15,869
Additions	4100 - DP - O/H Line Transf.	35,373
Additions	5000 - DP - Street Lights	849
Additions	5200 - DP - Services	11,893
Additions	9000 - DP - LED Street Lights	3,823
Retirements	3500 - DP - Wood Poles	20,140
Retirements	3900 - DP - O/H Cond.	19,409
Retirements	4000 - DP - O/H Cond.Devices	549
Retirements	4100 - DP - O/H Line Transf.	2,166
	Total Cost:	1,150,616
	Original Cost:	222,464

Capital Project Detailed Estimate

Location: Distribution
CI#: C0070787
Title: 91W-411 Labelle Road Phase Extension
Execution Year: 2025-2026

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Design	PD	223	$ 443	$ 98,922		
			Sub-Total	$ 98,922		
Materials						
Environment	Lot	1	$ 104	$ 104		
Wood poles	Lot	1	$ 64,974	$ 64,974		
O/H Cond.	Lot	1	$ 87,618	$ 87,618		
O/H Cond. Devices	Lot	1	$ 8,163	$ 8,163		
O/H O/H Line Transf.	Lot	1	$ 14,702	$ 14,702		
			Sub-Total	$ 175,562		
Contracts						
Tree Trimming	Lot	1	$ 162,000	$ 162,000		
Environment	Lot	1	$ 131	$ 131		
Wood poles	Lot	1	$ 231,930	$ 231,930		
O/H Cond.	Lot	1	$ 165,720	$ 165,720		
O/H Cond. Devices	Lot	1	$ 1,741	$ 1,741		
O/H Line Transf.	Lot	1	$ 8,198	$ 8,198		
Street Lights	Lot	1	$ 7,063	$ 7,063		
Services	Lot	1	$ 2,270	$ 2,270		
			Sub-Total	$ 579,558		
Royalties Easements Appraisals						
Easements	Lot	1	$ 10,000	$ 10,000		
			Sub-Total	$ 10,000		
Other Goods & Services						
Contingency	%	10%	$ 864,041	$ 86,404		
			Sub-Total	$ 86,404		
AFUDC						
AFUDC				$ 10,989		
			Sub-Total	$ 10,989		
Vehicle Overhead						
Vehicle AO				$ 49,350		
			Sub-Total	$ 49,350		
Administrative Overhead						
Labour AO				$ 56,015		
Contract AO				$ 83,816		
			Sub-Total	$ 139,831		
			SUB-TOTAL (no AO, AFUDC)	$ 950,446		
			TOTAL (AO, AFUDC included)	$ 1,150,616		
Original Cost				$ 222,464		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Document No: XXX-XX-XXXX-XXXX

Project Cost Estimate Input Checklist and Maturity Matrix

Transmission Line Infrastructure	Required fields:	Estimate Classification				
Project Name: 91W-411 Labelle Road Phase Extension	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)	Defined (D)	NR	P	D	D	D
B. Capacity						
Voltage (kV) and Circuits	Preliminary (P)	P	P			
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards	Preliminary (P)	NR	P			
Environmental Monitoring	Preliminary (P)	NR	NR	P	P	
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)	Not Applicable (NA)					
Contracting/Sourcing	Not Applicable (NA)	NR				
Escalation	Not Applicable (NA)	NR				
G. Planning						
System / Grid Planning (including substation and interconnect locations)	Preliminary (P)	P	P			
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Preliminary (P)	NR	P			
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Preliminary (P)	NR	P			
Risk Register	Not Applicable (NA)	NR				
Stakeholder Consultation/Engagement/Management Plan	Not Applicable (NA)	NR				
Work Breakdown Structure (WBS)	Preliminary (P)	NR	P			
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
H. Studies						
Routing Options	Not Applicable (NA)					
Topography & Bathymetry	Not Applicable (NA)					
Environmental Impact/Sustainablity Assessment	Not Applicable (NA)	NR				
Environment/Existing Conditions	Not Applicable (NA)	NR				
Meteorology and/or Oceanographic / Subsea	Not Applicable (NA)	NR				
Soils & Hydrology	Not Applicable (NA)	NR				
Technical Deliverables (Specifications and/or Drawings)						
Conductor, Insulator, Grounding, Joint Design (including protection for buried or subsea)	Complete (C)	S	P	C	C	C
Foundation / Structure (Tower) Design	Complete (C)	S	P	C	C	C
Route Mapping / Survey	Not Applicable (NA)					
Design Specifications	Complete (C)	NR	S/P	C	C	C
Instrument List	Complete (C)	NR	S/P	C	C	C
Construction Permits	Not Applicable (NA)	NR				
Geometric Layout, Alignment, Profile, Cross Section	Not Applicable (NA)	NR				
Land / ROW Title Negotiation	Not Applicable (NA)	NR				
Civil / Site / Structural / Architectural Discipline Drawings	Not Applicable (NA)	NR				
Crossings and Borings Designs and Drawings	Not Applicable (NA)	NR				
Demolition Plans and Drawings	Not Applicable (NA)	NR				
Erosion Control Plan & Drawings	Not Applicable (NA)	NR				
Foundation / Structure (Tower) Discipline Drawings	Not Applicable (NA)	NR				
Tower / Structure Location / Spotting	Not Applicable (NA)	NR				
Instrument Datasheets	Not Applicable (NA)	NR	NR/S			
Electrical Discipline Drawings	Not Applicable (NA)	NR	NR			
Instrumentation / Control System Discipline Drawings	Not Applicable (NA)	NR	NR			
	Total # Deliverables for this Project	6	16	11	9	8
	% Defined/Complete towards Class Estimate	100%	100%	65%	53%	47%

Comments:

This project is being submitted as an AACE Class 3 estimate with exception, with approximately 65% of the deliverables defined and complete. As per AACE guidelines, a contingency value between 10% and 30% is recommended for Class 3 projects. Given that previous projects of a similar nature have utilized a contingency of 10%, a 10% contingency has been applied for this project. While Requirements and some Planning elements are in Preliminary status, the impact of these on project cost is minimal. This contingency covers risks related to vegetation management and easement costs, and resource availability. Additionally, it accounts for potential increases in material and contract costs that could arise during the project.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its|current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Inclusions:

For the purposes of this document, the term *power transmission line infrastructure industries* is assumed to include greenfield or brownfield sites for overhead, buried and submarine transmission of electrical power in the infrastructure industries. High voltage is typically >100kV but may be less (e.g., 33 or 66kv) if long distance with light electrical loads. This excludes power supply and distribution scope within a process plant, mining facility, building complex or other facility site. It also excludes power generation facilities and substations. The defining deliverables of those excluded project scopes are covered in other RPs (e.g., 18R-97 for process plants [2]).

Power transmission is considered an element of the infrastructure industry. The Construction Industry Institute has provided a good definition of infrastructure in its Project Definition Rating Index for Infrastructure Projects as follows [3]:

"A capital project that provides transportation, transmission, distribution, collection or other capabilities supporting commerce or interaction of goods, services, or people. Infrastructure projects generally impact multiple jurisdictions, stakeholder groups and/or a wide area. They are characterized as projects with a primary purpose that is integral to the effective operation of a system. These collective capabilities provide a service that is made up of nodes and vectors into a grid or system."

Using this definition, power transmission lines are a vector or linear scope element that connects substation or other facility nodes at its terminations. The substation nodes may be part of or associated with a generation, consuming or interconnection facility. As such, transmission projects are often executed as part of a program that also involves node project scope or facility operational changes (or at least considerations for integrated system commissioning and startup). As the definition states, a distinguishing feature of these projects is that they often traverse wide areas, cross country or subsea, which puts an emphasis on the definition of routing, land ownership and conditions, and establishing right-of-way (ROW). Associated scope definition challenges include defining stakeholder, permitting and regulatory requirements. Buried and submarine installations increase the focus on the protection philosophy and strategies affecting cable selection, armoring and joint considerations. While many distinguish power transmission (higher voltage, long distances) from power distribution (short distance, lower voltage connections to retail customers), the principles of estimating these elements are similar; i.e., the RP applies to both.

The main physical power transmission line scope elements are conductors and their support structures if installed overhead. Main installation elements include land clearing if over land (including forestry if applicable), foundation and structure erection and conductor stringing if overhead, or trenching, laying and horizontal boring if subsurface or subsea. Special scope elements are involved with crossings of water, road, rail and so on and at terminations. Because conductor (e.g., aluminum) and structure (e.g., steel) material costs are usually a significant cost element, these project estimates are particularly sensitive to escalation uncertainty. In general, the more developed the route,

the more complex the installation will be. In urban areas, visual appeal and concern for safety and health can be major issues. Installation in remote location and/or difficult or environmentally sensitive terrain creates its own challenges. Subsea installation adds the need for bathymetry[1] and metocean[2] studies and specialized installation equipment and vessels. Before any installation work can begin in an area, stakeholder consultation must be advanced (sometimes requiring agreements with local populations with rights), and appropriate land and ROW must be acquired which creates unique scheduling as well as cost challenges.

For the purpose of estimate classification then, the main scope definition deliverables are associated with defining the power requirements (i.e., kV), the conductors and structure, and the routing. Conductors can vary widely in content (copper, aluminum, etc.) and insulation. Overhead structures may be wood, concrete, composite or steel in various configurations with various foundation designs including pilings, concrete and so on. The route's land or subsea characteristics and the nature of developments drive the need for special design features and execution strategies. Operability and maintainability considerations may also affect ROW and access design. Brownfield and revamp projects add their own concerns for interface with existing elements, crowded working conditions, etc. For each scope definition decision, stakeholder requirements need to be considered.

Power substation projects are usually associated with transmission projects. However, substations being equipment-centric and located on a facility site have physical and defining characteristics similar to process plant projects (e.g., reliance on one-line diagrams, plot plans, etc.).

CI Number: C0051815

Title: RTU Replacements Program – Phase 6

Start Date: 2024/04
In-Service Date: 2025/07
Final Cost Date: 2027/11
Function: General Plant
Forecast Amount: $5,959,915

DESCRIPTION:

Remote Terminal Units (RTUs) are deployed in substations and generating stations to allow for the exchange of telemetry and control signals to enable the effective operation of NS Power's SCADA system and power grid. The RTUs help monitor the system condition and also help restore outages faster when they occur. A robust RTU network is foundational for NS Power to deliver on Grid Modernization initiatives including advanced Protection Settings and Automation. This project provides for the replacement of fourteen RTUs in 2025 through 2027. The associated telecommunications equipment and the connection of Intelligent Electronic Devices (IEDs), such as recloser controllers, transformer meters, and relays, are included in this project.

Components removed will be retained and reused to enable NS Power to redeploy the equipment components as spare parts to extend the life of similar RTUs in service that are not yet being replaced. The work under this project will be completed over three years.

Summary of Related CIs +/- 2 years
Pursuant to Section 11.2 of the CEJC, related CIs for General Plant projects include "Work completed on the same asset (application, building, etc.)."

- No other projects in 2023, 2024, 2025, 2026, or 2027

Depreciation Class: General Plant – Communication Equipment - SCADA Eq

Estimated Life of the Asset: 20 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 9.04%

JUSTIFICATION:

Justification Criteria: Work Support Facilities

Sub Criteria: Telecontrol & Telecommunications

Why do this project?

Due to evolving industry standards, technology and product lifespans, approximately 74 of the RTUs that are currently in service have been deemed as obsolete by their manufacturers. The commercial availability of spare parts is becoming difficult to manage effectively. Equipment removed from service under this project can be harvested for spare parts which will support other existing RTUs until such time that they are also replaced.

In line with NS Power's Asset Management methodology, the condition and criticality (factoring in the age of existing RTUs, manufacturer life cycle dates, the RTU maintenance history, and criticality) of the RTUs on the system was assessed. The fourteen RTUs identified in this project had a risk rating indicating that risk mitigation activities were required. In this case, the appropriate risk mitigation activity is replacement. Each of these fourteen units will have reached or surpassed their expected 20-year life span and surpassed their manufacturer end of service date by ten years or more, and considering their overall risk profile, they need to be replaced.

Why do this project now?

The inventory of RTU spare parts has become sparse. The RTUs being replaced by this project have been deemed obsolete, as discussed above. RTU installations require extensive time and effort (approximately 12 weeks) to complete and having an effective RTU management plan is critical for the orderly replacement of units that are experiencing reliability issues and for the gradual modernization of the fleet.

The fourteen units in scope for this project have surpassed expected life, and manufacturer end of service date, are now considered to be obsolete, and at increasing risk of no longer being able to be maintained in working order.

This project is deemed in-service when the first RTU is installed (forecast to be July 2025), therefore the Final Cost Date (November 2027) is listed as six months after the last RTU is forecast to be completed (May 2027).

Why do this project this way?

RTU replacement is the only alternative as the targeted RTUs are now considered to be obsolete. The technology, both hardware and software, is familiar to field and engineering personnel through regular training and exposure. Additionally, standardization of equipment will lead to a more sustainable spare parts inventory. The approach for the execution of RTU replacements is based on previous new deployment and replacement project approaches and continues to be refined as experience grows; however, the overall methodology has been proven effective.

The selection of the first fourteen unit replacements is based on the overall risk matrix of condition and criticality.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment (professional engineers and project managers) and the non-binding contingency guidelines. Consistent with the maturity checklist this project is being filed as a Class 3 Estimate with a contingency value appropriate to that range. Risks intended to be covered by the contingency are overtime work that may be required, unexpected significant increase in currency exchange rate, or material cost. Risks are well understood based on past program experience, and similar past projects have included a 10% contingency, which has generally been required to complete the intended scope.

CI Number : C0051815 - RTU Replacements Program Phase 6 **Project Number** C0051815

Parent CI Number : -

Asset Location : 1500 - 1500 General Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	6400 - GP - Sup. Control and DA	5,356,516
Retirements	6400 - GP - Sup. Control and DA	603,400
	Total Cost:	5,959,915
	Original Cost:	2,747,780

Capital Project Detailed Estimate

Location: General Plant
CI# : C0051815
Title: RTU Replacements Program – Phase 6
Execution Year: 2025 - 2027

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
SM Electrician	PD	922	$ 450	$ 414,700		
Telecontrol Engineer	PD	648	$ 457	$ 295,812		
Telecontrol Technologist	PD	295	$ 450	$ 132,750		
PLT - Field Resources	PD	230	$ 450	$ 103,500		
Drafting SME CADD	PD	130	$ 425	$ 55,250		
Project Manager	PD	600	$ 450	$ 270,000		
SCADA	PD	52	$ 425	$ 22,100		
			Sub-Total	$ 1,294,112		
Term Labour						
RTU Technician	PD	1090	$ 425	$ 463,250		
				$ 463,250		
Overtime Labour						
SM Electrician	PD	20	$ 900	$ 18,000		
			Sub-Total	$ 18,000		
Travel Expense						
Travel	Lot	1	$ 117,150	$ 117,150		
			Sub-Total	$ 117,150		
Materials						
RTUs	Ea	14	$ 70,664	$ 989,300		
Cable and Accessories	Ea	14	$ 8,000	$ 112,000		
Power Meters	Ea	14	$ 5,170	$ 72,380		
Test Equipment and Tools	Lot	1	$ 11,000	$ 11,000		
			Sub-Total	$ 1,184,680		
Contracts						
Electrical Engineering Technologist	Days	546	$ 900	$ 491,400		
Civil Construction	Days	156	$ 1,430	$ 223,080		
			Sub-Total	$ 714,480		
Meals						
Meals	Units	378	$ 40	$ 15,120		
			Sub-Total	$ 15,120		
Contingency						
Contingency		10%	$ 3,806,792	$ 380,679		
			Sub-Total	$ 380,679		
Interest Capitalized						
AFUDC Interest				$ 17,848		
			Sub-Total	$ 17,848		
Vehicle Overhead						
Vehicle AO				$ 650,565		
				$ -		
			Sub-Total	$ 650,565		
Administrative Overhead						
Labour AO				$ 1,000,498		
Contractor AO				$ 103,533		
			Sub-Total	$ 1,104,031		
			SUB-TOTAL (no AO, AFUDC)	$ 4,187,471		
			TOTAL (AO, AFUDC included)	$ 5,959,915		
Original Cost				$ 2,747,780		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Project Cost Estimate Input Checklist and Maturity Matrix

Equipment Replacement	Required fields:	Estimate Classification				
Project Name: C0051815 - RTU Replacements Program – Phase 6	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
B. Capacity						
Not Applicable						
C. Project Location						
Hardware (server, network infrastructure)	Defined (D)	P	P	D	D	D
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Legislative Requirements	Not Applicable (NA)	NR				
E. Technology Selection						
Design/Technology	Defined (D)	NR	P	D	D	D
F. Strategy						
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Preliminary (P)	NR	P			
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Preliminary (P)	NR	P			
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
Technical Deliverables (Specifications and/or Drawings)						
Network Infrastructure	Complete (C)	P	P	C	C	C
Data Architecture	Complete (C)	P	P	C	C	C
Security Assessment	Complete (C)	NR	P	C	C	C
Privacy Impact Assessment	Not Applicable (NA)	NR				
Information Systems / Telecommunication Drawings	Preliminary (P)	NR	P			
Total Responses	**Total # Deliverables for this Project**	5	19	15	14	14
Percentage	**% Defined/Complete towards Class Estimate**	100%	100%	79%	74%	74%

Comments:

The maturity matrix indicates that 79% of the deliverables used in compiling a Class 3 estimate with exception have been completed. The critical scope of this work is well understood based on previous program replacements and the estimate is considered to have AACE Class 3 accuracy. While the Project Schedule, WBS, Telecommunication Drawings e.t.c. are in preliminary status, the impact of these on project costs is minimal and not enough to lower this estimate from a Class 3.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Note: This checklist is intended to be used for IT/OT projects. In lieu of specific AACE guidelines for these types of projects, this checklist was developed by NSPI following the principles of the guidelines to demonstrate confidence in the cost estimate maturity.

CI Number: C0070907

Title: MDR-8000 Microwave Radio Replacement

Start Date:	2025/01
In-Service Date:	2025/09
Final Cost Date:	2027/09
Function Class:	General Plant
Forecast Amount:	$1,572,478

DESCRIPTION:

This project provides for the engineering, procurement, and installation and reconfiguration of the required microwave radio support equipment for the modernization and standardization of NS Power's backbone communications system.

NS Power owns and operates a province-wide backbone telecommunications system carrying voice and data traffic for critical utility applications. This includes SCADA data and control, teleprotection, substation equipment access and monitoring, fault location, mobile radio and substation phones. The backbone infrastructure is also used to carry user traffic (internet access and phone) to substations and offices across the province.

This upgrade is required because of technological advancement, rendering older equipment obsolete and unsupported by vendors. Time-Division Multiplexing (TDM) technology is no longer the industry standard and has been replaced by packet technology. For NS Power to remain aligned with industry standards, an upgrade to the backbone system capacity is required. The existing frequencies and tower infrastructure will be reused.

Summary of Related CI's +/- 2 years:
Pursuant to Section 11.2 of the CEJC, related CIs for General Plant projects include work completed on the same asset (application, building, etc.).

- No other projects in 2023, 2024, 2025, 2026, or 2027

Depreciation Class: General Plant – Communication Equipment

Estimated Life of the Asset: 15 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 6.6%

JUSTIFICATION:

Justification Criteria: Work Support Facilities

Sub Criteria: Telecommunication

Why do this project?

This upgrade is required because of technological advancement, rendering older equipment obsolete and unsupported by vendors. The current point-to-point radio links are experiencing performance problems due to their condition. Upgrading to newer technology will enable NS Power to eliminate outdated equipment and transition site traffic to NS Power's modern Multi-Protocol Label Switching (MPLS) communications network, enhancing monitoring and reliability for these sites.

Why do this project now?

The MDR-8000 Radios currently in service have been discontinued by the manufacturer for 8 years and unsupported for 6 years. NS Power's spare parts inventory is exhausted, making it increasingly difficult to maintain these links. A modern system is required to ensure reliable communications for the affected sites.

This project is deemed in-service when the first radio is replaced (forecast to be September 2025), therefore the Final Cost Date (September 2027) is listed as six months after the last radio is forecast to be replaced (March 2027).

Why do this project this way?

The Nokia 9500-MPR radios are NS Power's approved technology and the direct replacement for the MDR-8000 radios at large sites with line-of-sight to an existing radio site. Swapping the old radios for new ones can be done without making any major changes at the site. This approach offers a cost-effective solution, allowing NS Power to provide the necessary functionality while seamlessly integrating with the Company's new MPLS technology at the radio site.

Contingency Statement

Contingency for this project was determined using a combination of internal subject matter expert judgment (professional engineers and project managers) and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate, with a contingency value appropriate to that range. Risks intended to be covered by the contingency are additional overtime work that may be required and the Canadian/US exchange rate on the material. Risks are well understood based on past experience of NS Power replacing 80% of the NS Power Microwave Backbone network with the same labour requirements, technology and equipment. Therefore, a contingency of 5% on this project is appropriate.

CI Number : C0070907 - MDR-8000 Microwave Radio Replacement **Project Number** C0070907

Parent CI Number : -

Asset Location : 1500 - 1500 General Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account		Forecast Amount
Additions	6000 - GP - Broadband Radio		1,562,701
Retirements	6000 - GP - Broadband Radio		9,777
		Total Cost:	1,572,478
		Original Cost:	992,865

Capital Project Detailed Estimate

Location: Transmission
CI#: C0070907
Title: MDR-8000 Microwave Radio Replacement
Execution Year: 2025-2027

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
T&D Labour - Design	PD	88	$ 443	$ 39,060		
T&D Labour - Tech	PD	114	$ 427	$ 48,640		
			Sub-Total	$ 87,700		
Overtime Labour						
T&D Labour - Tech	PD	1	$ 855	$ 960		
			Sub-Total	$ 960		
Materials						
Microwave Radio Equipment	Lot	1	$ 1,311,000	$ 1,311,000		
			Sub-Total	$ 1,311,000		
Travel Expense						
Travel Expense	Lot	1	$ 300	$ 300		
			Sub-Total	$ 300		
Meals						
Meals	Lot	1	$ 150	$ 150		
			Sub-Total	$ 150		
Other Goods & Services						
Contingency	%	5%	$ 1,400,110	$ 70,006		
			Sub-Total	$ 70,006		
AFUDC						
AFUDC				$ 8,438		
			Sub-Total	$ 8,438		
Vehicle Overhead						
Vehicle AO				$ 43,991		
			Sub-Total	$ 43,991		
Administrative Overhead						
Labour AO				$ 49,933		
			Sub-Total	$ 49,933		
			SUB-TOTAL (no AO, AFUDC)	$ 1,470,116		
			TOTAL (AO, AFUDC included)	$ 1,572,478		
Original Cost				$ 992,865		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B. Columns C through G will auto-populate.

Document No: XXX-XX-XXXX-XXXX

Project Cost Estimate Input Checklist and Maturity Matrix

Equipment Replacement	Required fields:	Estimate Classification				
Project Name: MDR-8000 Microwave Radio Replacement	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
B. Capacity						
Not Applicable						
C. Project Location						
Hardware (server, network infrastructure)	Defined (D)	P	P	D	D	D
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Legislative Requirements	Not Applicable (NA)	NR				
E. Technology Selection						
Design/Technology	Defined (D)	NR	P	D	D	D
F. Strategy						
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Not Applicable (NA)	NR				
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Defined (D)	NR	P	D	D	D
Start-up & Commissioning Plan	Defined (D)	NR	P	P/D	D	D
Technical Deliverables (Specifications and/or Drawings)						
Network Infrastructure	Complete (C)	P	P	C	C	C
Data Architecture	Complete (C)	P	P	C	C	C
Security Assessment	Preliminary (P)	NR	P			
Privacy Impact Assessment	Not Applicable (NA)	NR				
Information Systems / Telecommunication Drawings	Complete (C)	NR	P	C	C	C
Total Responses	**Total # Deliverables for this Project**	5	18	17	17	17
Percentage	**% Defined/Complete towards Class Estimate**	100%	100%	94%	94%	94%

Comments:

The maturity matrix indicates that 94% of deliverables used in compiling a Class 3 estimate with exception have been completed. The critical scope of this work is well understood based on previous upgrade using the same technology, equipment, and required labour resources. While the Security Assessment is in Preliminary status, the impact of this on project cost is minimal. Contingency is intended to account for risks associated with additional overtime work that may be required to complete the project, and any unforeseen USD:CAD FX increases for materials cost. The estimate is considered to have AACE Class 3 accuracy.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- **Not Required (NR):** May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- **Preliminary (P):** Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- **Defined (D):** Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- **Not Required (NR):** Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- **Started (S):** Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- **Preliminary (P):** Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- **Complete (C):** The deliverable has been reviewed and approved as appropriate.

Note: This checklist is intended to be used for IT/OT projects. In lieu of specific AACE guidelines for these types of projects, this checklist was developed by NSPI following the principles of the guidelines to demonstrate confidence in the cost estimate maturity.

CI Number: C0069270

Title: 2025 SCADA/EMS Upgrade

Start Date: 2024/07
In-Service Date: 2026/01
Final Cost Date: 2026/09
Function: General Plant
Forecast Amount: $1,306,288

DESCRIPTION:

This project includes the detailed design, implementation, data migration, change management, and deployment of physical and software assets for the purposes of managing and maintaining situational awareness of the bulk electric system.

The Supervisory Control and Data Acquisition / Energy Management System (SCADA / EMS) is a purpose-built software solution used by the Energy Control Centre (ECC) operators to monitor and control the provincial power system. Its primary function is to provide remote monitoring and control of generation, transmission, and distribution substations around the province and manage the reliable delivery of energy to NS Power customers.

The current SCADA version (AspenTech OSI Monarch) requires an upgrade to maintain vendor support. This upgrade will also ensure efficient access to future enhancements and patches.

Summary of Related CIs +/- 2 years
Pursuant to Section 11.2 of the CEJC, related CIs for General Plant projects include "Work completed on the same asset (application, building, etc.)."

- No other projects in 2023, 2024, 2025, 2026 or 2027.

Depreciation Class: General Plant - Communication Equipment – SCADA Eq

Estimated Life of the Asset: 6 Years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 2.9%%

JUSTIFICATION:

Justification Criteria: Work Support Facilities

Sub Criteria: Telecontrol & Telecommunications

Why do this project?

Upgrading the SCADA/EMS system software and supporting third-party software is necessary to maintain NERC compliance (CIP-007-5 – Cyber Security – Systems Security Management) by addressing components reaching the end of support. Maintaining a current version of the application ensures vendor support is available; allows NS Power to apply newly released bug fixes, cybersecurity vulnerabilities or system patches that are released by the vendor; and ensures that new system features can be utilized as they are released by the vendor.

Without adequate vendor support, resolution to system issues could be prolonged, leading to impacts in energy delivery to NS Power customers.

Why do this project now?

Executing a software upgrade at this time is required to bring the latest technology support and compatibility including functionality to support grid batteries and solar farm modeling and maintain NERC compliance with CIP-007-5 Cyber Security – Systems Security Management standards. The technology architecture including SCADA infrastructure

system sizing, and the operating system of SCADA are close to end-of-life support. Performing an upgrade now will also align with technology modernization requirements for modeling and controlling grid batteries and solar farms.

The introduction of bulk electric grid battery storage and additional renewable energy resources will change the operation of traditional energy delivery architecture. This project and its upgrade of NS Power's SCADA/EMS will provide future functionality, allowing for the accommodation of bulk energy storage and the associated benefits (such as quicker power restoration, or grid stabilization).

This project is deemed in-service when the SCADA system is upgraded (forecast to be January 2026), therefore the Final Cost Date (September 2026) is listed as six months after the final testing is to be completed (March 2026).

Why do this project this way?

Upgrading NS Power's existing SCADA System and associated infrastructure (hardware, operating system, etc.) will result in performance improvements, enhanced security, reduced vulnerabilities, delivery of full support on hardware and software and compatibility with new and emerging technologies (such as grid batteries).

Alternative platforms were not considered in this evaluation as OSI Monarch is already in place. It is fit for purpose for NS Power requirements and given the lifecycle timeline and the team's working knowledge of the environment, is the best technically feasible solution.

For these reasons, keeping the same vendor, and leveraging NS Power's existing Aspentech OSI supplier of choice agreement will allow for minimal organizational change as it relates to this project.

Contingency Statement

Contingency for this project has been determined at 20 percent using a combination of internal subject matter project and financial management expert judgement (professional engineers and project managers) based on past SCADA upgrade project experience, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 Estimate (which aligns with the project's current decision gate (DG3)), with a contingency value appropriate to that range. Risks intended to be covered by contingency include potential vendor cost increases and potential delays that may arise during execution (such as technical issues resulting in additional testing or defect resolution).

CI Number : C0069270 - 2025 SCADA/EMS Upgrade **Project Number** C0069270

Parent CI Number : -

Asset Location : 1500 - 1500 General Plant General **Budget Version** 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	6400 - GP - Sup. Control and DA	1,295,750
Retirements	6400 - GP - Sup. Control and DA	10,538
	Total Cost:	1,306,288
	Original Cost:	625,339

Capital Project Detailed Estimate

Location: General Plant
CI# : C0069270
Title: 2025 SCADA/EMS Upgrade Project
Execution Year: 2025-2026

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
IT Project Manager	PD	11	$ 420	$ 4,620		
Business Systems Analyst	PD	25	$ 420	$ 10,500		
Senior Solutions Architect	PD	19	$ 420	$ 7,770		
Analyst, Business	PD	14	$ 420	$ 5,880		
QA Test Lead	PD	16	$ 420	$ 6,552		
Cyber Risk Analyst	PD	8	$ 420	$ 3,507		
Infrastructure Analyst	PD	4	$ 420	$ 1,680		
Network Analyst	PD	7	$ 420	$ 2,772		
OCM	PD	10	$ 420	$ 4,200		
SCADA Engineer	PD	144	$ 420	$ 60,270		
SCADA Team Lead	PD	47	$ 420	$ 19,530		
NERC CIP Specialist	PD	2	$ 420	$ 958		
Manager IT Grid & Energy Del.	PD	6	$ 420	$ 2,696		
Test System Expert	PD	1	$ 420	$ 479		
			Sub-Total	$ 131,414		
Comp Hardware & Op Software						
Servers/Workstations	Lot	1	[redacted]			
				$ -		
			Sub-Total	[redacted]		
Consulting						
Cybersecurity Risk Assessments	Lot	1	[redacted]			
System Architecture Configuration	Lot	1				
Implementation Services	Lot	1				
USD Exchange	%	36%				
			Sub-Total	[redacted]		
Other Goods & Services						
Contingency	%	20%	$ 992,967	$ 198,593		
			Sub-Total	$ 198,593		
Interest Capitalized						
AFUDC				$ 40,060		
				$ -		
			Sub-Total	$ 40,060		
Administrative Overhead						
Labour AO				$ 74,668		
			Sub-Total	$ 74,668		
			SUB-TOTAL (no AO, AFUDC)	$ 1,191,560		
			TOTAL (AO, AFUDC included)	$ 1,306,288		
Original Cost				$ 625,339		

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.
Note 2: Small differences in totals are attributable to rounding.

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Instructions: Select option in Column B.
Columns C through G will auto-populate.

Document No: XXX-XX-XXXX-XXXX

Project Cost Estimate Input Checklist and Maturity Matrix

Equipment Replacement	Required fields:	Estimate Classification				
Project Name: 2025 SCADA/EMS Upgrade	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
B. Capacity						
Not Applicable						
C. Project Location						
Hardware (server, network infrastructure)	Defined (D)	P	P	D	D	D
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Legislative Requirements	Defined (D)	NR	P	D	D	D
E. Technology Selection						
Design/Technology	Defined (D)	NR	P	D	D	D
F. Strategy						
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
Logistics Plan	Preliminary (P)	P	P	P		
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Preliminary (P)	NR	P			
Work Breakdown Structure (WBS)	Defined (D)	NR	P	D	D	D
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
Technical Deliverables (Specifications and/or Drawings)						
Network Infrastructure	Complete (C)	P	P	C	C	C
Data Architecture	Complete (C)	P	P	C	C	C
Security Assessment	Complete (C)	NR	P	C	C	C
Privacy Impact Assessment	Complete (C)	NR	P	C	C	C
Information Systems / Telecommunication Drawings	Complete (C)	NR	P	C	C	C
Total Responses	**Total # Deliverables for this Project**	5	21	20	18	18
Percentage	**% Defined/Complete towards Class Estimate**	100%	100%	95%	86%	86%

Comments:

This project is being submitted as an AACE Class 3 estimate with exceptions. The deliverables of this project indicate that 95% of the Class 3 deliverables have been completed. Therefore, AACE recommends that a contingency value of 10% to 40% should be applied to this project. Contingency is intended to account for risks associated with vendor potential delays that may arise during execution such as technical issues resulting in additional testing or defect resolution. Logistics plan, stakeholder consultation/engagement/management plan and start-up and commissioning plan are not critical and should not impact the overall budget.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Note: This checklist is intended to be used for IT/OT projects. In lieu of specific AACE guidelines for these types of projects, this checklist was developed by NSPI following the principles of the guidelines to demonstrate confidence in the cost estimate maturity.

CONFIDENTIALITY MATRIX

LEGEND	
Confidential in Entirety (shaded)	TS = Technical Support
Partially Confidential (Italicized)	CS = Cost Support
(1) = Commercial/Cost Information	
(2) = Third Party Proprietary Information	*Includes Description, PowerPlant (PP), Detailed Cost Estimate (DCE), and Economic Analysis Model (EAM) (or Total Cost of Ownership (TCO) for IT projects).
(3) = System Security	

Function/Tab	Capital Work Order	Work Order Main Body*	Attachment 1	Attachment 2	Attachment 3	Attachment 4	Attachment 5
Generation							
	Hydro Projects						
G01	C0048990 - HYD - AVO 2 Switchgear Replacement	*DCE (1)*					
G02	C0039266 - HYD - Gulch Overhaul						
	Steam Projects						
	Steam Turbine						
G03	C0068882 - TUC1 Generator Refurbishment						
G04	C0068887 – TUC3 Turbine Valves Refurbishment	*DCE (1)*	*Vendor Quote (1)*	*Vendor Proposal (1)*			
G05	C0068659 - TRE5 IP-LP Turbine Refurbishment						
Transmission							
T01	C0031048 - 91H-T11 Transformer Replacement						
T02	C0068961 - 2025 PCB Substation Sampling and Replacement						
T03	C0069232 - L6021 Replacements and Upgrades Phase 1						
T04	C0069227 - L6516 Replacements and Upgrades Phase 3						
T05	C0069231 - L8002 Replacements and Upgrades Phase 1						
T06	C0070048 - L5027B Replacements and Upgrades Phase 1						
T07	C0053295 - L-5004 Kearney Lake Structure Replacement						
T08	C0069238 - 2025/2026 Steel Tower Refurbishment						
T09	C0057682 - Spare Transformer Replacement						
T10	C0050852 - 10V-T1 Transformer Replacement						
T11	C0050834 - Spare EHV Breaker Replacements						
Distribution							
D01	C0068952 - 2025 PCB Poletop Sampling and Replacement						
D02	C0068953 - 2025 PCB Light Replacement						
D03	C0068954 - 2025 PCB Potential Downline Device Sampling and Replacement						
D04	C0068786 - 2025 Padmount Replacement Program						
D05	C0070787 - 91W-411 Labelle Road Phase Extension						
General Plant							
GP01	C0051815 - RTU Replacements Program - Phase 6						
GP02	C0070907 - MDR-8000 Microwave Radio Replacement						
GP03	C0069270 - 2025 SCADA/EMS Upgrade	*DCE (1)*					

1 - Commercial Information
To protect value for customers and mitigate the risk of prospective proponents having access to the information itemized in the confidentiality matrix, and maintain good business relations with vendors, this information is confidential.

The more a supplier is aware of NS Power's specific requirements and a competing vendor's costs, the better the supplier's ability to obtain the highest price, reduce competition and ultimately increase the cost for NS Power and its customers. The cost of such transparency is not always immediately evident. Information from regulatory proceedings can provide competitive advantages over other suppliers, and that could be advantageous in bidding or negotiation. Higher prices, or avoidable contractual constraints, will result in unnecessary higher costs to customers.

NS Power seeks to keep the terms and conditions of suppliers pricing and arrangements confidential from their other customers or potential competitors. This prevents competitors from using the information to gain a competitive advantage. This is equally true for NS Power, which desires to protect its ability to acquire services and equipment on the most competitive terms. Those "best" terms may not be available if there is a risk that they will be disclosed to the customers or competitors of the supplier.

Since NS Power customer rates are cost-based, the maintenance of confidentiality for this item is to the direct benefit of customers.

2 - Third Party Proprietary Information
This is information belonging to third parties for which those third parties have asserted confidentiality over proprietary cost and technical information.

3 - System Security
One-Line diagrams frequently included in system planning studies are confidential due to system security concerns. Protection of the power system preserves reliability and reduces the risks associated with external threats.

2025 ACE Plan Appendix B has been filed electronically.

NS Power 2024 Capital Spend
3rd Quarter Overview - as of September 30, 2024

	Generation	Distribution	Transmission	General Property	Total NS Power
2024 Submitted ACE Total*	**$ 142,075,182**	**$ 141,689,937**	**$ 89,627,494**	**$ 59,676,098**	**$ 433,068,711**
Total YTD Spend	109,393,465	129,653,730	104,468,210	37,701,255	381,216,659
Variance YTD/ACE Spend	(32,681,717)	(12,036,207)	14,840,716	(21,974,843)	(51,852,052)
Percentage of ACE Spent as of September 30, 2024	77%	92%	117%	63%	88%
Add:					
ATOs	(877,200)	-	1,407,522	-	530,322
U&Us/P&As	358,748	-	3,048,136	-	3,406,884
Changes to ACE Items for Subsequent Approval	3,474	(461,088)	33,979,582	1,840,081	35,362,049
Total Increase	**(514,978)**	**(461,088)**	**38,435,240**	**1,840,081**	**39,299,255**
Less:					
Projects cancelled	(987,614)	(850,000)	(273,923)	(1,626,359)	(3,737,897)
Projects deferred	(10,447,483)	(1,209,876)	(5,221,857)	(3,961,785)	(20,841,002)
Total Decrease	**(11,435,097)**	**(2,059,876)**	**(5,495,780)**	**(5,588,144)**	**(24,578,898)**
2024 Potential Capital Spend**	**$ 130,125,107**	**$ 139,168,973**	**$ 122,566,954**	**$ 55,928,035**	**$ 447,789,068**

* Amounts reflect NS Power's amended requested budget for D004 to $8,563,623, and the associated amended 2024 ACE Plan total, as approved in the Board's 2024 ACE Plan Order and Decision dated August 13, 2024.
** Amounts do not reflect the reforecast of capital projects since the 2024 ACE Plan submission, or reforecasting of subsequent items filed.

NS Power Capital Item Status Update

3rd Quarter Overview - as of September 30, 2024

This report includes all projects submitted to the NSUARB and remain active, as well as ACE Plan subsequent submittal projects. Projects are removed from this report once the project has been final costed (internal or external), cancelled, or falls below $1M.

Status	Category	CI Number	Title	ACE Plan Reference (or U&U and P&A)	Submission/Date	ACE Amount	Submission or Approved Amount	Actual Spend	FIN Submission Date	FIN Amount	Variance
Deferred	Generation	39472	HYD - Mersey Redevelopment Phase 1	2022 ACE Plan (for Subsequent Approval)		$ 189,447,076		$ 21,216,864			
Less than $1M	General Plant	47751	ECC Dynamic Line Rating Implementation	2022 ACE Plan (for Subsequent Approval)	OTQ - December 2, 2019	$ 5,144,525	$ 4,978,090	$ 290,361			
Approved	Generation	49634	HYD - Trout River Diversion Structure Replacement	2022 ACE Plan (for Subsequent Approval)	Q1 - May 13, 2024	$ 1,822,300	$ 3,402,776	$ 3,315,964			
Approved	Distribution	C0008638	Cogswell HRM Redevelopment Program	2022 ACE Plan (for Subsequent Approval)	OTQ - June 6, 2022	$ 6,982,854	$ 6,617,148	$ 4,433,280			
Deferred	Transmission	C0022247	1N-Onslow 138 kV Add Second 42 MVA Power Transformer	2022 ACE Plan (for Subsequent Approval)		$ 4,500,000		$ 136,991			
Approved	Transmission	43267	13V Gulch Hydro Replace 13V-GT1 and 13V-VR1	2015 ACE Plan	2015 ACE Plan	$ 1,061,902	$ 1,061,902	$ 1,011,993			
Approved	Transmission	52314	1C-GT1/UT1 Replacement	2018 ACE Plan	2018 ACE Plan	$ 2,032,393	$ 2,032,393	$ 1,678,006			
Approved	Transmission	49815	2017 / 2018 Steel Tower Refurbishment	2017 ACE Plan	2017 ACE Plan	$ 2,003,317	$ 2,003,317	$ 1,937,433			
Approved	Distribution	49919	2017 PCB Pole Top Transformer Replacement	2017 ACE Plan	2017 ACE Plan	$ 2,446,051	$ 2,446,051	$ 2,550,603			
Approved	Transmission	49818	2017/2018 Transmission Switch & Breaker Replacement	2017 ACE Plan	2017 ACE Plan	$ 1,074,472	$ 1,074,472	$ 1,096,991			
Approved	Distribution	51493	2018 PCB Pole Top Transformer Replacement	2018 ACE Plan	2018 ACE Plan	$ 1,360,354	$ 1,360,354	$ 1,384,297			
Approved	Transmission	51403	2018 PCB Removal Program	2018 ACE Plan	2018 ACE Plan	$ 4,402,342	$ 4,402,342	$ 3,516,277			
Approved	Transmission	52258	2018/2019 Isolated Structure Replacement	2018 ACE Plan	2018 ACE Plan	$ 4,818,521	$ 4,818,521	$ 294,849			
Approved	Transmission	51398	2018/2019 Steel Tower Refurbishment	2018 ACE Plan	2018 ACE Plan	$ 1,992,692	$ 1,992,692	$ 2,053,078			
Approved	Transmission	51406	2018/2019 Transmission Switch & Breaker Replacement	2018 ACE Plan	2018 ACE Plan	$ 1,405,891	$ 1,405,891	$ 1,136,173			
Approved	Distribution	47787	2H Armdale New Feeders	2017 ACE Plan (for Subsequent Approval)	OTQ - April 6, 2020	$ 1,285,679	$ 1,734,221	$ 1,723,920			
Approved	Transmission	52328	56N-T1 Transformer Upgrades	2018 ACE Plan	2018 ACE Plan	$ 1,279,271	$ 1,279,271	$ 1,307,910			
Approved	Transmission	51975	5P Mobile Substation Replacement	2018 ACE Plan	2018 ACE Plan	$ 4,829,458	$ 4,829,458	$ 2,990,048			
Approved	Transmission	51956	6P Mobile Substation Rewind U&U	U&U	Q3 2017 - October 30, 2017	$ -	$ 1,516,121	$ 1,056,956			
Approved	Distribution	47124	Advanced Metering Infrastructure	2017 ACE Plan (for Subsequent Approval)	OTQ - February 17, 2023	$ 8,274,738	$ 143,495,844	$ 142,877,404			
Approved	Generation	48914	HYD - Malay Falls Facility Repair	2017 ACE Plan (for Subsequent Approval)	Q3 2017 - October 30, 2017	$ 446,237	$ 1,034,045	$ 1,018,533			
Approved	Generation	47551	HYD - SHH Controls Upgrade	2016 ACE Plan (for Subsequent Approval)	Q4 2015 - January 29, 2016	$ 1,092,851	$ 1,749,212	$ 1,965,328			
Deferred	Generation	49942	HYD - Tidewater Facility Refurbishment	2018 ACE Plan	2018 ACE Plan	$ 1,234,178	$ 1,234,178	$ 77,460			
Withdrawn	Generation	29807	HYD - Tusket Falls Main Dam	2017 ACE Plan (for Subsequent Approval)	OTQ - July 23, 2021	$ 9,940,664	$ 36,826,119	$ 24,670,008			
Approved	Generation	51234	HYD - WRC HVAC Upgrade	2018 ACE Plan	2018 ACE Plan	$ 1,876,537	$ 1,876,537	$ 1,888,893			
Approved	Generation	51235	HYD - WRC Main Access Rd Refurbishment	2018 ACE Plan	2018 ACE Plan	$ 2,686,075	$ 2,686,075	$ 2,684,503			
Approved	Generation	48791	HYD - WRC Safety Standards Upgrades	2018 ACE Plan (for Subsequent Approval)	OTQ - June 4, 2018	$ 1,019,928	$ 1,760,570	$ 1,951,912			
Approved	Generation	51236	HYD - WRC Tailrace Rock Bolting	2018 ACE Plan	2018 ACE Plan	$ 8,861,996	$ 8,861,996	$ 8,112,398			
Approved	Generation	48052	HYD Annapolis HVAC Upgrade	2017 ACE Plan (for Subsequent Approval)	OTQ - March 8, 2017	$ 1,498,367	$ 1,573,596	$ 1,814,619			
Approved	Generation	44978	HYD-Wreck Cove Automation	2015 ACE Plan (for Subsequent Approval)	Q2 2015 - July 31, 2015	$ 2,379,999	$ 3,802,446	$ 3,265,750			
Deferred	General Plant	49600	IT - Network Architecture Redesign	2017 ACE Plan (for Subsequent Approval)		$ 1,183,826		$ -			
Approved	General Plant	49855	IT Desktop SW Modernization	2017 ACE Plan (for Subsequent Approval)	Q3 2017 - October 30, 2017	$ 2,013,034	$ 4,620,516	$ 4,501,621			
Approved	Transmission	47950	L5017 Replacements & Upgrades	2016 ACE Plan	Q1 2018 - May 7, 2018	$ 2,182,142	$ 3,062,664	$ 3,011,657			
Approved	Transmission	47949	L5028 Replacements and Upgrades	2016 ACE Plan	2016 ACE Plan	$ 1,144,355	$ 1,144,355	$ 943,253			
Approved	Transmission	49790	L5505 Replacements and Upgrades	2017 ACE Plan	2017 ACE Plan	$ 1,223,571	$ 1,223,571	$ 815,759			
Approved	Transmission	49778	L5535 Replacements and Upgrades	2017 ACE Plan	OTQ - April 16, 2018	$ 1,261,920	$ 2,590,269	$ 2,837,177			
Approved	Transmission	49779	L6537 Replacements and Upgrades	2018 ACE Plan	OTQ - March 4, 2019	$ 1,255,220	$ 2,331,474	$ 2,284,616			
Approved	Transmission	52320	L6549 2018 Replacements & Upgrades	2018 ACE Plan	2018 ACE Plan	$ 1,406,535	$ 1,406,535	$ 1,452,523			
Approved	Transmission	44987	L7003 Lidar Upgrades	2015 ACE Plan (for Subsequent Approval)	OTQ - August 31, 2015	$ 6,885,817	$ 11,032,275	$ 10,905,774			
Approved	Transmission	49793	L7011 Replacements and Upgrades	2017 ACE Plan	OTQ - April 1, 2019	$ 3,343,484	$ 4,810,276	$ 4,591,706			
Approved	Transmission	47954	L7012 Replacements and Upgrades	2017 ACE Plan	2017 ACE Plan	$ 4,428,520	$ 4,428,520	$ 4,392,086			
Approved	Generation	49940	LM6000 TUC5 Control System Upgrade	2017 ACE Plan (for Subsequent Approval)	OTQ - July 3, 2018	$ 1,018,769	$ 1,275,559	$ 1,070,506			
Approved	Transmission	C0001900	Mount Hope 69-25kV Substation	2018 ACE Plan	2018 ACE Plan	$ 2,982,338	$ 2,982,338	$ 2,997,776			
Approved	Transmission	52323	Port Hastings 2C BPS Upgrade	P&A	Q2 - August 7, 2018	$ -	$ 4,201,449	$ 3,997,958			
Approved	General Plant	50153	Self Serve Development Phase 2	2017 ACE Plan (for Subsequent Approval)	OTQ - September 15, 2017	$ 1,827,720	$ 1,160,528	$ 1,316,269			
Not Approved at this time	Transmission	43678	Separate L8004/L7005 on Canso Crossing Double Circuit Tower(DCT)	2017 ACE Plan (for Subsequent Approval)	OTQ - January 27, 2022*	$ 16,183,691	$ 20,387,278	$ 20,387,278			
Not Approved at this time	Transmission	45066	Upgrade L6511 and L7019 Thermal Rating	2015 ACE Plan (for Subsequent Approval)	OTQ - January 27, 2022*	$ 3,693,033	$ 2,691,017	$ 2,691,017			
Not Approved at this time	Transmission	43324	Replace L6513 / Upgrade Line Terminals	2015 ACE Plan (for Subsequent Approval)	OTQ - January 27, 2022*	$ 23,429,902	$ 18,626,428	$ 18,625,082			
Not Approved at this time	Transmission	45067	67N Onslow 345 KV Node Swap	2014 ACE Plan (for Subsequent Approval)	OTQ - January 27, 2022*	$ 3,006,487	$ 2,982,714	$ 2,982,585			
Approved	Transmission	48022	Spider Lake Substation Addition	2016 ACE Plan (for Subsequent Approval)	OTQ - March 4, 2019	$ 6,348,981	$ 9,158,260	$ 9,066,398			
Internally FIN'd	Generation	44267	TRE Ash Lagoon Site Closure	2015 ACE Plan	OTQ - July 7, 2017 (partially approved)	$ 7,994,849	$ 8,993,879	$ 9,307,338			
Awaiting Approval	Generation	50518	HYD - Ruth Falls Main Dam Refurbishment	2019 ACE Plan	OTQ - October 11, 2024	$ 7,244,422	$ 15,445,508	$ 4,396,264			
Approved	Generation	C0002539	HYD - Bridge Remediation 2019	2019 ACE Plan	2019 ACE Plan	$ 6,843,686	$ 6,843,686	$ 6,204,939	OTQ - September 16, 2024	$ 6,204,939	$ (638,747)
Approved	Generation	48638	TRE - Rail Car Fuel Delivery Upgrade	2019 ACE Plan	2019 ACE Plan	$ 1,236,623	$ 1,236,623	$ 1,209,419			
Approved	Transmission	C0010042	2019 Transmission Right-of-Way Widening 69kV	2019 ACE Plan	2019 ACE Plan	$ 5,650,794	$ 5,650,794	$ 5,633,875			
Approved	Transmission	C0010948	2019/2020 Sacrificial Anode Installation Program	2019 ACE Plan	2019 ACE Plan	$ 3,099,862	$ 3,099,862	$ 3,244,208			
Approved	Transmission	C0010952	2019/2020 Substation Polychlorinated Biphenyl (PCB) Equipment Removal	2019 ACE Plan	2019 ACE Plan	$ 2,786,245	$ 2,786,245	$ 2,679,672			
Approved	Transmission	C0010949	2019/2020 Steel Tower Life Extension	2019 ACE Plan	2019 ACE Plan	$ 2,414,140	$ 2,414,140	$ 2,178,231			
Approved	Transmission	C0011339	L6549 - Replacements and Upgrades Phase 2	2019 ACE Plan	Q1 - May 13, 2024	$ 2,209,907	$ 3,993,974	$ 3,551,656			
Approved	Transmission	C0011241	L5026 - Replacements and Upgrades	2019 ACE Plan	2019 ACE Plan	$ 1,498,789	$ 1,498,789	$ 1,379,563			
Approved	Transmission	C0010978	2019/2020 Transmission Switch & Breaker Replacement	2019 ACE Plan	2019 ACE Plan	$ 1,044,148	$ 1,044,148	$ 1,029,498			
Approved	Transmission	C0011243	L5551 - Replacements and Upgrades	2019 ACE Plan	2019 ACE Plan	$ 1,014,077	$ 1,014,077	$ 1,115,386			
Approved	Distribution	C0011208	2019 Padmount Replacement Program	2019 ACE Plan	2019 ACE Plan	$ 1,413,544	$ 1,413,544	$ 1,465,212			
Approved	Distribution	C0006319	2019 PCB Pole Top Transformer Replacements	2019 ACE Plan	2019 ACE Plan	$ 1,177,592	$ 1,177,592	$ 1,282,046			
Approved	General Plant	C0013438	IT - T&D WAM Phase 1 - GIS and Field Design System	2019 ACE Plan (2018 Pending Submission)	OTQ - December 7, 2018	$ 7,978,434	$ 7,978,434	$ 8,098,223			
Partial Approval	Generation	C0013838	HYD WRC LEM Unit Rehabilitation	2020 ACE Plan (2019 Pending Submission)	OTQ - February 21, 2020	$ 109,691,967	$ 101,787,264	$ 89,080,016			
Approved	Distribution	47794	Heckman's Island Submarine Cable Replacement	2021 ACE Plan (for Subsequent Approval)	Q1 2021 - May 3, 2021	$ 1,296,112	$ 1,338,364	$ 1,522,969			
Approved	General Plant	C0011378	Route Network Upgrades	2020 ACE Plan (2019 Pending Submission)	OTQ - December 2, 2019	$ 5,724,240	$ 5,717,752	$ 5,536,648			
Approved	General Plant	49480	IT - Data Centre Disaster Recovery	2020 ACE Plan (2019 Pending Submission)	OTQ - December 2, 2019	$ 6,103,798	$ 6,335,162	$ 6,242,674			
Approved	General Plant	C0010838	MCC - HVAC Replacement	2019 ACE Plan (for Subsequent Approval)	OTQ - October 4, 2021	$ 1,071,364	$ 1,606,254	$ 1,531,910			
Approved	General Plant	C0002137	ECC - Map Board and Technology Modernization	2019 ACE Plan (for Subsequent Approval)	Q3 - November 4, 2019	$ 2,568,789	$ 2,506,268	$ 2,274,318			
Approved	Transmission	C0021105	L7002 Replacements and Upgrades Phase 2	P&A	Q3 - November 4, 2019	$ -	$ 3,121,442	$ 3,320,027			
Approved	Distribution	C0020623	New Distribution Rights-of-Way Phase 5	2020 ACE Plan	2020 ACE Plan	$ 10,015,266	$ 10,015,266	$ 9,930,358			
Approved	Transmission	C0020627	2020 Transmission Right-of-Way Widening 69kV	2020 ACE Plan	2020 ACE Plan	$ 5,489,820	$ 5,489,820	$ 5,617,282			
Approved	Transmission	C0011261	101W Port Mersey Substation Expansion	2020 ACE Plan	2020 ACE Plan	$ 4,651,384	$ 4,651,384	$ 4,252,185			
Approved	Transmission	C0021123	2020/2021 Substation Polychlorinated Biphenyl (PCB) Equipment Removal	2020 ACE Plan	2020 ACE Plan	$ 5,197,372	$ 5,197,372	$ 5,348,086			
Approved	Transmission	C0021106	L7005 Replacements and Upgrades Phase 1	2020 ACE Plan	2020 ACE Plan	$ 3,576,991	$ 3,576,991	$ 3,136,424	Q2 - August 6, 2024	$ 3,136,430	$ (440,561)
Approved	Generation	49949	LM6000 TUC4 Control System Replacement	2020 ACE Plan	2020 ACE Plan	$ 1,149,996	$ 1,149,996	$ 901,766			
Approved	Transmission	C0011321	L5031 Replacements and Upgrades Phase 1	2020 ACE Plan	2020 ACE Plan	$ 2,147,212	$ 2,147,212	$ 367,756			
Approved	Transmission	C0021107	L8001 Replacements and Upgrades Phase 1	2020 ACE Plan	2020 ACE Plan	$ 2,292,093	$ 2,292,093	$ 2,517,260			

NS Power Capital Item Status Update

3rd Quarter Overview - as of September 30, 2024

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Status	Category	CI Number	Title	ACE Plan Reference (or U&U and P&A)	Submission/Date	ACE Amount	Submission or Approved Amount	Actual Spend	FIN Submission Date	FIN Amount	Variance
Approved	Distribution	C0020835	2020 Padmount Replacement Program	2020 ACE Plan	2020 ACE Plan	$ 1,612,389	$ 1,612,389	$ 1,515,078			
Approved	Transmission	C0021122	2020/2021 Transmission Switch & Breaker Replacement	2020 ACE Plan	2020 ACE Plan	$ 1,312,643	$ 1,312,643	$ 1,502,435			
Approved	Transmission	C0010955	2020/2021 Wood Pole Retreatment Program	2020 ACE Plan	2020 ACE Plan	$ 1,410,561	$ 1,410,561	$ 912,015	OTQ - July 2, 2024	$ 912,015	$ (498,546)
Approved	Distribution	C0020834	2020/2021 Inaccessible PCB Transformer Replacements	2020 ACE Plan	2020 ACE Plan	$ 2,950,294	$ 2,950,294	$ 3,095,184			
Approved	General Plant	C0021109	New RTU Deployment Project	2020 ACE Plan	2020 ACE Plan	$ 8,028,097	$ 8,028,097	$ 6,524,610			
Approved	Transmission	52303	L7019 Replacements and Upgrades	2020 ACE Plan	2020 ACE Plan	$ 1,374,092	$ 1,374,092	$ 1,383,196			
Approved	Transmission	C0021323	Trenton 50N-T13 Replacement	2020 ACE Plan	2020 ACE Plan	$ 1,516,880	$ 1,516,880	$ 1,336,009			
Approved	Transmission	C0021026	Willow Lane 15N-T3 Replacement	2020 ACE Plan	2020 ACE Plan	$ 1,326,647	$ 1,326,647	$ 1,179,586			
Approved	Generation	49756	HYD - Marshall Falls Main Dam Refurbishment	2020 ACE Plan	2020 ACE Plan	$ 5,452,794	$ 5,452,794	$ 601,515			
Approved	Transmission	C0021142	19W-T51 Transformer Replacement	2020 ACE Plan	2020 ACE Plan	$ 1,512,336	$ 1,512,336	$ 1,473,279			
Approved	Distribution	C0021182	93V-313-Meteghan Rebuild	2020 ACE Plan	2020 ACE Plan	$ 1,075,625	$ 1,075,625	$ 927,225			
Approved	General Plant	46075	IT - T&D WAM Phase 2 – Work Management and Scheduling & Dispatch	2022 ACE Plan (2021 Pending Submission)	OTQ - December 21, 2021	$ 57,487,877	$ 56,733,723	$ 56,733,723	OTQ - September 16, 2024	$ 56,733,723	$ (4,170,417)
Approved	Distribution	C0010778	Smart Grid Nova Scotia Project	2020 ACE Plan (for Subsequent Approval)	OTQ - December 5, 2019	$ 6,740,589	$ 7,053,622	$ 6,708,348			
Approved	Distribution	C0019379	50N-410 - 4C-430 Highway 104 Twinning	2020 ACE Plan (for Subsequent Approval)	OTQ - June 1, 2020	$ 1,361,237	$ 1,137,223	$ 1,228,682			
Approved	Generation	C0020385	LIN Heavy Oil Tank Refurbishment	2020 ACE Plan (for Subsequent Approval)	OTQ - January 28, 2021	$ 1,162,325	$ 3,396,731	$ 2,805,664			
Approved	General Plant	C0023622	AMO Substation and Transmission APM Program	2020 ACE Plan (for Subsequent Approval)	OTQ - April 6, 2020	$ 2,087,848	$ 2,217,589	$ 2,365,541			
Partial Approval	Generation	C0014218	HYD WRC LEM Balance of Plant	2021 ACE Plan (2020 Pending Submission)	OTQ - April 30, 2021	$ 21,186,378	$ 27,637,896	$ 20,309,347			
Approved	General Plant	C0023623	AMO Distribution APM Program	2020 ACE Plan (for Subsequent Approval)	OTQ - April 6, 2020	$ 1,708,240	$ 1,721,484	$ 1,818,109			
Approved	Generation	16374	HYD Gaspereau Dam Safety	2008 ACE Plan	OTQ - February 23, 2020	$ 4,354,889	$ 22,703,451	$ 12,041,292			
Approved	General Plant	C0017098	Ragged Lake Generator Replacement	P&A	Q2 2020 - August 4, 2020	$ -	$ 2,229,267	$ 1,651,133			
Approved	Distribution	C0031083	New Distribution Rights-of-Way Phase 6	2021 ACE Plan	2021 ACE Plan	$ 9,762,735	$ 9,762,735	$ 9,705,373			
Approved	Transmission	C0031263	2021/2022 Substation Polychlorinated Biphenyl (PCB) Equipment Removal	2021 ACE Plan	2021 ACE Plan	$ 7,512,226	$ 7,512,226	$ 6,900,350			
Approved	Transmission	C0031089	2021/2022 Transmission Right-of-Way Widening 69kV	2021 ACE Plan	2021 ACE Plan	$ 5,288,520	$ 5,288,520	$ 5,512,596			
Approved	Transmission	C0031122	L6539 Replacements and Upgrades	2021 ACE Plan	2021 ACE Plan	$ 2,821,842	$ 2,821,842	$ 1,239,414			
Approved	Transmission	C0031085	L6516 Line Replacement and Upgrades	2021 ACE Plan	2021 ACE Plan	$ 2,730,592	$ 2,730,592	$ 2,533,174			
Approved	Transmission	C0031050	New Spare Large Autotransformer	2021 ACE Plan	2021 ACE Plan	$ 2,398,564	$ 2,398,564	$ 2,373,033			
Approved	Transmission	C0033644	2021/2022 Steel Tower Life Extension	2021 ACE Plan	2021 ACE Plan	$ 2,332,746	$ 2,332,746	$ 1,830,411			
Approved	Transmission	C0033645	2021/2022 Steel Tower Refurbishment	2021 ACE Plan	2021 ACE Plan	$ 1,944,005	$ 1,944,005	$ 2,170,711			
Approved	Transmission	C0031069	L6020 Replacements and Upgrades	2021 ACE Plan	2021 ACE Plan	$ 1,825,300	$ 1,825,300	$ 1,520,929	OTQ - July 2, 2024	$ 1,520,929	$ (304,371)
Approved	Distribution	C0031145	2021 Padmount Replacement Program	2021 ACE Plan	2021 ACE Plan	$ 1,636,153	$ 1,636,153	$ 1,166,806			
Approved	Transmission	C0031262	2020/2021 Transmission Switch and Breaker Replacement	2021 ACE Plan	2021 ACE Plan	$ 1,483,048	$ 1,483,048	$ 1,464,606			
Approved	Transmission	C0031064	L5054 Replacements and Upgrades	2021 ACE Plan	2021 ACE Plan	$ 1,134,737	$ 1,134,737	$ 1,002,725			
Approved	Generation	46483	CT - TUS Control System Upgrade	2021 ACE Plan	2021 ACE Plan	$ 1,046,322	$ 1,046,322	$ 719,619			
Approved	Generation	C0026285	TRE Heavy Fuel Oil Tank Refurbishment	2021 ACE Plan (for Subsequent Approval)	OTQ - June 10, 2021	$ 1,732,921	$ 2,979,546	$ 2,288,962			
Approved	General Plant	C0030987	IT - NERC CIP Environment Refresh	2022 ACE Plan (2021 Pending Submission)	OTQ - March 7, 2022	$ 1,446,131	$ 1,259,927	$ 1,306,249			
Approved	Distribution	C0041892	New Distribution Rights-of-Way Phase 7	2022 ACE Plan	2022 ACE Plan	$ 9,854,291	$ 9,854,291	$ 9,951,865			
Approved	Generation	C0038747	LIN1 L-0 Blade Replacement	2022 ACE Plan	2022 ACE Plan	$ 6,066,800	$ 6,066,800	$ 5,464,335	Q2 - August 6, 2024	$ 5,464,335	$ (602,465)
Approved	Generation	C0029693	CT - VJ1 Generator Replacement	2022 ACE Plan	2022 ACE Plan	$ 5,942,640	$ 5,942,640	$ 4,136,405	OTQ - September 16, 2024	$ 4,136,405	$ (1,806,236)
Approved	Transmission	C0041893	2022/2023 Transmission Right-of-Way Widening 69kV	2022 ACE Plan	2022 ACE Plan	$ 5,312,315	$ 5,312,315	$ 5,185,197			
Approved	Transmission	C0041837	2022/2023 Substation Polychlorinated Biphenyl (PCB) Equipment Removal	2022 ACE Plan	2022 ACE Plan	$ 3,805,434	$ 3,805,434	$ 2,916,656			
Approved	Generation	C0041906	PHB – 2022 Turbine Refurbishment	2022 ACE Plan	2022 ACE Plan	$ 3,729,597	$ 3,729,597	$ 3,566,324			
Approved	Transmission	C0041793	L7002 Replacements and Upgrades Phase 2	2022 ACE Plan	2022 ACE Plan	$ 3,640,960	$ 3,640,960	$ 3,845,962			
Approved	Transmission	C0041805	L7005 Replacements and Upgrades Phase 2	2022 ACE Plan	2022 ACE Plan	$ 3,182,518	$ 3,182,518	$ 2,909,294			
Approved	Transmission	C0041989	2022/2023 Sacrificial Anode Installation Program	2022 ACE Plan	2022 ACE Plan	$ 3,015,107	$ 3,015,107	$ 2,773,423			
Deferred	Transmission	C0041794	L5031 Replacements and Upgrades Phase 2	2022 ACE Plan	2022 ACE Plan	$ 2,905,019	$ 2,905,019	$ -			
Approved	Transmission	C0041796	L6020 Replacements and Upgrades Phase 2	2022 ACE Plan	2022 ACE Plan	$ 2,518,243	$ 2,518,243	$ 3,281,196	OTQ - October 7, 2024	$ 3,281,196	$ 762,953
Approved	Transmission	C0041810	L5022 Replacements and Upgrades	2022 ACE Plan	2022 ACE Plan	$ 2,172,200	$ 2,172,200	$ 1,618,003			
Approved	Transmission	C0041791	L6551 Replacements and Upgrades	2022 ACE Plan	2022 ACE Plan	$ 1,988,246	$ 1,988,246	$ -			
Approved	Distribution	C0043130	2022 Padmount Replacement Program	2022 ACE Plan	2022 ACE Plan	$ 1,807,359	$ 1,807,359	$ 1,716,290			
Approved	Generation	C0030529	TUC3 Generator Refurbishment	2022 ACE Plan	2022 ACE Plan	$ 1,629,926	$ 1,629,926	$ 1,593,297			
Approved	Transmission	C0043571	2022/2023 Transmission Switch & Breaker Replacement	2022 ACE Plan	2022 ACE Plan	$ 1,612,638	$ 1,612,638	$ 1,547,519			
Approved	Transmission	C0041790	L8001 Replacements and Upgrades Phase 2	2022 ACE Plan	2022 ACE Plan	$ 1,395,537	$ 1,395,537	$ 1,169,772			
Approved	Generation	C0036368	HYD - Lower Great Brook Switchgear Replacement	2022 ACE Plan	2022 ACE Plan	$ 1,362,281	$ 1,362,281	$ 1,395,531			
Approved	Transmission	C0043010	2022/2023 Wood Pole Retreatment Program	2022 ACE Plan	2022 ACE Plan	$ 1,300,037	$ 1,300,037	$ 770,171			
Approved	Transmission	C0041800	L5537 Replacements and Upgrades	2022 ACE Plan	2022 ACE Plan	$ 1,270,698	$ 1,270,698	$ 648,216	Q2 - August 6, 2024	$ 648,216	$ (622,482)
Approved	Transmission	C0041804	2022 Line Retirement Program	2022 ACE Plan	2022 ACE Plan	$ 1,242,178	$ 1,242,178	$ 160,544			
Approved	Generation	C0024484	HYD - Fourth Lake Switchgear Replacement	2022 ACE Plan	2022 ACE Plan	$ 1,145,245	$ 1,145,245	$ 901,701			
Approved	Generation	C0029691	CT - VJ1 Control System Upgrade	2022 ACE Plan	2022 ACE Plan	$ 1,016,225	$ 1,016,225	$ 1,002,085			
Approved	Transmission	C0045132	ECEI - Battery Energy Storage System Project	2022 ACE Plan (for Subsequent Approval)	OTQ - January 25, 2024	$ 171,207,920	$ 237,772,259	$ 64,954,672			
Deferred	Generation	C0044392	Eastern Clean Energy Initiative (ECEI) - Coal Conversion	2022 ACE Plan (for Subsequent Approval)		$ 32,341,325		$ 1,810,899			
Deferred	Generation	C0034486	HYD - WRC LEM Penstock intake	2022 ACE Plan (for Subsequent Approval)		$ 11,239,851		$ 1,206,698			
Approved	Generation	C0000979	HYD - Governor Dam Refurbishment	2022 ACE Plan (for Subsequent Approval)	OTQ - November 6, 2023	$ 2,696,630	$ 4,844,345	$ 3,961,395			
Approved	Distribution	C0022662	22C-404GA Lennox Passage Rebuild	2022 ACE Plan (for Subsequent Approval)	OTQ - July 4, 2022	$ 2,352,191	$ 2,609,595	$ 353,974			
Deferred	Transmission	C0036826	L8004 Parallel Canso Strait Crossing	2022 ACE Plan (for Subsequent Approval)		$ 2,139,081		$ -			
Approved	General Plant	C0041994	NERC CIP 2022	2022 ACE Plan (for Subsequent Approval)	OTQ - April 4, 2022	$ 1,379,474	$ 1,247,663	$ 952,390			
Approved	Generation	C0041651	TUC HFO Tank 4 Refurbishment	2022 ACE Plan (for Subsequent Approval)	Q4 - February 6, 2023	$ 1,110,293	$ 2,734,313	$ 2,756,903			
Internally FIN'd	General Plant	C0005498	IT - Endpoint Security	2022 ACE Plan (for Subsequent Approval)	OTQ - April 4, 2022	$ 1,064,684	$ 1,580,572	$ 1,610,295			
Approved	Transmission	C0010956	78W-Martin's Brook Substation Relocation	P&A	OTQ - September 6, 2022	$ -	$ 3,146,109	$ 3,388,526			
Approved	Transmission	C0045510	20V-T52 Transformer Replacement	U&U	Q3 - November 7, 2022	$ -	$ 1,506,566	$ 1,425,641			
Approved	Transmission	C0041807	L5534 Replacements and Upgrades	P&A	OTQ - December 5, 2022	$ -	$ 1,426,418	$ 1,467,520			
Approved	Transmission	C0049212	L8001 Replacements and Upgrades Phase 3	P&A	OTQ - December 5, 2022	$ -	$ 1,263,906	$ 1,208,029			
Approved	Transmission	C0050835	2023/2024 Steel Tower Refurbishment	P&A	OTQ - December 5, 2022	$ -	$ 2,056,635	$ 1,084,338			
Approved	Transmission	C0052055	2023/2024 Transmission Right-of-Way Widening 69kV	P&A	OTQ - December 5, 2022	$ -	$ 5,332,315	$ 4,909,476			
Approved	Distribution	C0052056	New Distribution Rights-of-Way Phase 8	P&A	OTQ - December 5, 2022	$ -	$ 9,796,663	$ 9,088,167			
Approved	Transmission	C0052634	L5016 Replacements and Upgrades	P&A	OTQ - December 5, 2022	$ -	$ 2,697,637	$ 2,860,649			
Approved	Generation	C0001222	CT BGT1 Engine Exchange	P&A	OTQ - January 9, 2023	$ -	$ 2,338,747	$ 2,351,297			
Approved	Generation	C0055376	TUC1 - LP Blade Refurbishment U&U	U&U	Q4 - February 6, 2023	$ -	$ 2,025,440	$ 1,988,075			
Approved	Generation	C0041506	LM6000 Engine 191-253 Refurbishment	2023 ACE Plan	OTQ - March 7, 2024	$ 8,740,979	$ 13,473,407	$ 13,022,781			
Approved	Generation	C0012838	HYD - Lequille Canal Dyke, Gates and Tailrace Refurbishment	2023 ACE Plan	2023 ACE Plan	$ 7,058,816	$ 7,058,816	$ 1,343,325			
Approved	Generation	C0029682	CT VJ2 - Replace Generator Assembly	2023 ACE Plan	2023 ACE Plan	$ 5,397,738	$ 5,397,738	$ 954,965			

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Status	Category	CI Number	Title	ACE Plan Reference (or U&U and P&A)	Submission/Date	ACE Amount	Submission or Approved Amount	Actual Spend	FIN Submission Date	FIN Amount	Variance
Approved	Generation	C0051134	TUC2 - L-0 Blade Replacement	2023 ACE Plan	2023 ACE Plan	$ 4,157,503	$ 4,157,503	$ 4,168,405			
Approved	Transmission	C0041788	L6516 Replacements and Upgrades Phase 2	2023 ACE Plan	OTQ July 2, 2024	$ 3,123,474	$ 5,442,794	$ 3,341,542			
Approved	Transmission	C0055539	10H-T1 Transformer Replacement	2023 ACE Plan	2023 ACE Plan	$ 2,420,892	$ 2,420,892	$ 35,218			
Approved	Transmission	C0052299	2023/2024 Steel Tower Life Extension	2023 ACE Plan	2023 ACE Plan	$ 2,195,463	$ 2,195,463	$ 759,074			
Approved	Transmission	C0055796	2023 EHV Breaker Replacements	2023 ACE Plan	OTQ - October 2, 2023	$ 2,048,411	$ 3,463,489	$ 50,631			
Approved	Transmission	C0055696	L5031 Replacement and Upgrades Robinson Corner Tap	2023 ACE Plan	2023 ACE Plan	$ 1,357,477	$ 1,357,477	$ 990,466			
Approved	Distribution	C0050836	2023 Padmount Replacement Program	2023 ACE Plan	2023 ACE Plan	$ 1,309,551	$ 1,309,551	$ 1,242,092			
Approved	Generation	C0051135	TUC2 - Turbine Valves Refurbishment 2023	2023 ACE Plan	2023 ACE Plan	$ 1,048,924	$ 1,048,924	$ 967,772			
Approved	Transmission	C0052654	L5541 Water Crossing Upgrades	2023 ACE Plan	2023 ACE Plan	$ 1,047,074	$ 1,047,074	$ -			
Approved	Generation	C0015798	WRC Tunnel T-2 Fall of Ground Remediation	2023 ACE Plan (for Subsequent Approval)	OTQ - March 16, 2023	$ 22,788,029	$ 22,780,580	$ 22,774,841			
Approved	Transmission	C0053316	Michelin Voltage Sag Reduction DVR	2023 ACE Plan (for Subsequent Approval)	OTQ - April 12, 2024	$ 21,007,507	$ 31,170,675	$ 30,250,200			
Approved	General Plant	C0042166	IT - Data Loss Prevention (DLP) Platform	2023 ACE Plan (for Subsequent Approval)	OTQ - June 7, 2023	$ 3,233,905	$ 4,261,239	$ 3,939,186			
Approved	Generation	C0051894	TUC - HFO Tank 3 Refurbishment	2023 ACE Plan (for Subsequent Approval)	OTQ - March 7, 2024	$ 2,053,937	$ 2,218,012	$ 2,252,224			
Approved	General Plant	C0030984	IT - Cisco UCS Lifecycle	2023 ACE Plan (for Subsequent Approval)	OTQ - September 5, 2023	$ 2,047,691	$ 2,456,609	$ 2,088,998			
Approved	Generation	C0044030	WIN - DIG Haight's Brook Crossing Replacement	2023 ACE Plan (for Subsequent Approval)	OTQ - November 6, 2023	$ 2,046,985	$ 2,024,052	$ 183,948			
Deferred	Generation	C0047973	HYD - ANN Sluice Gates and Check Refurbishment	2023 ACE Plan (for Subsequent Approval)		$ 1,957,501		$ 199,503			
Approved	Transmission	C0055557	76V-T1 Transformer Replacement	2023 ACE Plan (for Subsequent Approval)	OTQ - June 7, 2023	$ 1,751,258	$ 2,515,095	$ 119,837			
Internally FIN'd	General Plant	C0043910	IT - Customer Energy Management Phase 2	2023 ACE Plan (for Subsequent Approval)	OTQ - March 6, 2023	$ 1,636,480	$ 1,683,098	$ 1,656,245			
Approved	General Plant	C0047294	IT - Microsoft Enterprise Agreement Renewal	2023 ACE Plan (for Subsequent Approval)	OTQ - June 7, 2023	$ 1,609,423	$ 2,104,569	$ 1,824,753	Q2 - August 6, 2024	$ 1,824,753	$ (279,816)
Approved	General Plant	C0011167	IT - Backup Infrastructure Upgrade	2023 ACE Plan (for Subsequent Approval)	OTQ - June 7, 2023	$ 1,557,471	$ 2,315,457	$ 2,295,818			
Not Approved at this time	General Plant	C0053215	Sackville Depot Back Up Generator	2023 ACE Plan (for Subsequent Approval)	OTQ - June 7, 2023	$ 1,206,506	$ 1,409,078	$ -			
Approved	Generation	C0048591	CT VJ1 Engine P686621 Refurbishment	P&A	OTQ - March 6, 2023	$ -	$ 2,312,509	$ 2,283,878			
Approved	Generation	C0054356	TUC – Roof Replacement U&U	U&U	OTQ - March 6, 2023	$ -	$ 1,459,455	$ 1,412,020			
Approved	Generation	C0053916	CT BGT4 Engine P686630 Refurbishment	U&U	OTQ - April 3, 2023	$ -	$ 1,850,501	$ 1,730,871			
Approved	Transmission	C0031052	Replenish Spare Transformer Used at 58C	2021 ACE Plan (Less than $1M)	OTQ - June 7, 2023	$ 982,910	$ 1,303,827	$ 1,070,167			
Approved	Generation	51761	LIN2 2022/2023 Winter Capacity Requirement	U&U	OTQ - September 5, 2023	$ -	$ 2,512,341	$ 2,526,651			
Approved	Transmission	C0059403	62H Low Voltage Switchgear Replacement	U&U	OTQ - September 5, 2023	$ -	$ 1,485,176	$ 1,362,578			
Approved	Generation	C0006418	HYD WRC Tailrace Tunnel Rock Bolting Phase 2	2024 ACE Plan	2024 ACE Plan	$ 15,722,669	$ 15,722,669	$ 802,183			
Approved	Generation	C0041050	LIN 824 Wheeled Dozer Replacement	2024 ACE Plan	2024 ACE Plan	$ 1,607,862	$ 1,607,862	$ 1,530,935			
Approved	General Plant	C0047277	IT - GIS Utility Network Upgrade	2024 ACE Plan	2024 ACE Plan	$ 6,175,230	$ 6,175,230	$ 1,646,800			
Approved	Generation	C0049013	HYD - Lower Great Brook Log Hoist Replacement	2024 ACE Plan	2024 ACE Plan	$ 2,158,658	$ 2,158,658	$ 1,504,354			
Approved	Generation	C0049032	HYD - Cowie Falls Log Hoist Replacement	2024 ACE Plan	2024 ACE Plan	$ 2,237,991	$ 2,237,991	$ 1,296,905			
Approved	General Plant	C0049619	IT - ERP Upgrade (EBS, PS, PP, OBIA)	2024 ACE Plan	2024 ACE Plan	$ 6,198,799	$ 6,198,799	$ 3,000,964			
Approved	Transmission	C0050842	2024 Bulk Oil Breaker Replacement Program	2024 ACE Plan	2024 ACE Plan	$ 3,274,756	$ 3,274,756	$ 361,808			
Approved	Generation	C0051136	TUC2 - HP/IP Turbine Refurbishment	2024 ACE Plan	2024 ACE Plan	$ 4,264,777	$ 4,264,777	$ 1,266,013			
Approved	Transmission	C0056240	2024/2025 Transmission Switch and Breaker Replacements	2024 ACE Plan	2024 ACE Plan	$ 3,271,622	$ 3,271,622	$ 2,057,475			
Approved	Distribution	C0057142	New Distribution Rights-of-Way Phase 9	2024 ACE Plan	2024 ACE Plan	$ 19,141,914	$ 19,141,914	$ 19,105,417			
Approved	Transmission	C0057882	2024 Pennsylvania Breaker Replacements	2024 ACE Plan	2024 ACE Plan	$ 2,163,832	$ 2,163,832	$ 233,475			
Approved	Generation	C0058942	WRC D11-2 Foundation Stabilization	2024 ACE Plan	2024 ACE Plan	$ 1,540,602	$ 1,540,602	$ 665,507			
Approved	Transmission	C0059046	101S and 79N Reactor Replacements	2024 ACE Plan	2024 ACE Plan	$ 1,460,062	$ 1,460,062	$ 47,671			
Approved	Generation	C0060608	TUC6 Turbine Refurbishment	2024 ACE Plan	2024 ACE Plan	$ 2,472,311	$ 2,472,311	$ 85,474			
Approved	Generation	C0060707	CT BGT1 Generator Refurbishment	2024 ACE Plan	2024 ACE Plan	$ 3,482,602	$ 3,482,602	$ 5,769			
Approved	Distribution	C0060749	2024 Padmount Replacement Program	2024 ACE Plan	2024 ACE Plan	$ 1,288,198	$ 1,288,198	$ 625,132			
Approved	Transmission	C0061023	2024 EHV Breaker Replacements	2024 ACE Plan	2024 ACE Plan	$ 3,638,480	$ 3,638,480	$ -			
Approved	Transmission	C0061046	2024 Merlin Gerin Breaker Replacements	2024 ACE Plan	2024 ACE Plan	$ 1,169,591	$ 1,169,591	$ 30,613			
Approved	Transmission	C0061387	2024 2025 Wood Pole Retreatment Program	2024 ACE Plan	2024 ACE Plan	$ 1,209,391	$ 1,209,391	$ 3,466			
Approved	Transmission	C0061403	2024 2025 Sacrificial Anode Installation Program	2024 ACE Plan	2024 ACE Plan	$ 2,382,113	$ 2,382,113	$ 1,217,360			
Approved	Transmission	C0061545	L6006 Replacements and Upgrades	2024 ACE Plan	2024 ACE Plan	$ 5,032,640	$ 5,032,640	$ 1,919,749			
Approved	Transmission	C0061546	L6514 Replacements and Upgrades	2024 ACE Plan	2024 ACE Plan	$ 2,102,666	$ 2,102,666	$ 1,081,098			
Approved	Transmission	C0061547	L7022 Replacements and Upgrades	2024 ACE Plan	2024 ACE Plan	$ 2,283,569	$ 2,283,569	$ 9,703			
Approved	Transmission	C0061550	L5031 Replacements and Upgrades - Hubbards to East Chester	2024 ACE Plan	2024 ACE Plan	$ 5,297,584	$ 5,297,584	$ 914			
Approved	Transmission	C0061551	L7009 Replacements and Upgrades	2024 ACE Plan	2024 ACE Plan	$ 3,280,328	$ 3,280,328	$ 220			
Approved	Transmission	C0061743	L6038 Realignment	2024 ACE Plan	2024 ACE Plan	$ 1,032,911	$ 1,032,911	$ 17,876			
Approved	Transmission	C0061883	129H - Kearney Lake Substation Rebuild	2024 ACE Plan	2024 ACE Plan	$ 1,017,322	$ 1,017,322	$ 10,464			
Approved	General Plant	C0054755	IT - Connect My Data (Green Button)	2024 ACE Plan (for Subsequent Approval)	Q4 - February 5, 2024	$ 2,309,350	$ 2,964,237	$ 1,916,831			
Deferred	Transmission	C0031286	Spare Padmounted Substation	2024 ACE Plan (for Subsequent Approval)		$ 1,319,838		$ -			
Less than $1M	General Plant	C0032664	ECC Optimization Tools Project	2024 ACE Plan (for Subsequent Approval)		$ 4,329,150		$ 2,514,218			
Less than $1M	Generation	C0041507	CT TUS1 Exhaust Stack Replacement	2024 ACE Plan (for Subsequent Approval)		$ 2,018,092		$ 214,128			
Pending Submission	Generation	C0050414	HYD Roseway Asset Decommissioning	2024 ACE Plan (for Subsequent Approval)		$ 4,650,648		$ 3,388,026			
Cancelled	Transmission	C0050838	2023 Substation Primary Equipment Spares	2024 ACE Plan (for Subsequent Approval)		$ 2,026,155		$ -			
Less than $1M	Generation	C0053654	HYD Cowie Falls Generator Refurbishment	2024 ACE Plan (for Subsequent Approval)		$ 2,233,169		$ -			
Less than $1M	Generation	C0060323	PTMT-Coal Pile Modifications	2024 ACE Plan (for Subsequent Approval)		$ 3,211,624		$ 285,425			
Pending Submission	Generation	C0060816	POT - HFO Tank Refurbishment	2024 ACE Plan (for Subsequent Approval)		$ 2,012,803		$ 3,168,181			
Less than $1M	General Plant	C0061286	IT - Enterprise Vulnerability Management	2024 ACE Plan (for Subsequent Approval)		$ 1,152,070		$ 100,133			
Deferred	General Plant	C0061287	IT - Third Party Risk Management	2024 ACE Plan (for Subsequent Approval)		$ 1,405,970		$ -			
Less than $1M	General Plant	C0061289	IT - Network Next Generation Security Design	2024 ACE Plan (for Subsequent Approval)		$ 2,632,635		$ 898,076			
Approved	Distribution	C0061521	New Distribution Rights-of-Way Phase 10	2024 ACE Plan (for Subsequent Approval)	OTQ - October 7, 2024	$ 18,904,608	$ 20,890,176	$ 3,145,980			
Approved	Generation	C0038126	HYD Cowie Falls Unit 12 Overhaul	2024 ACE Plan (Less than $1M)	Q1 - May 13, 2024	$ 964,521	$ 1,274,890	$ 81,410			
Approved	Generation	C0053655	HYD Cowie Falls Unit 11 Overhaul	2023 ACE Plan (Less than $1M)	Q1 - May 13, 2024	$ 913,947	$ 1,225,491	$ 1,284,106			
Approved	Generation	C0059283	LIN2 PE 2023/2024 Winter Capacity Requirements	U&U	Q1 - May 13, 2024	$ -	$ 1,661,834	$ 1,663,857			
Approved	Transmission	C0062123	143H-Mount Uniacke Substation	P&A	Q2 - August 6, 2024	$ -	$ 9,040,869	$ 173,047			
Approved	General Plant	C0056461	IT - Contact Centre Cloud Migration	2024 ACE Plan (for Subsequent Approval)	OTQ - September 16, 2024	$ 929,372	$ 3,237,539	$ 656,924			
Awaiting Approval	Transmission	C0031048	91H-T11 Transformer Replacement	2025 ACE Plan	2025 ACE Plan	$ 6,914,622		$ 14,698			
Awaiting Approval	Generation	C0039266	HYD - Gulch Overhaul	2025 ACE Plan	2025 ACE Plan	$ 1,371,379		$ 68,403			
Awaiting Approval	Generation	C0048990	HYD AVO 2 Switchgear Replacement	2025 ACE Plan	2025 ACE Plan	$ 1,814,631		$ 186,274			
Awaiting Approval	Transmission	C0050834	Spare EHV Breaker Replacements	2025 ACE Plan	2025 ACE Plan	$ 1,178,832		$ 151			
Awaiting Approval	Transmission	C0050852	10V-T1 Transformer Replacement	2025 ACE Plan	2025 ACE Plan	$ 2,113,337		$ 9,674			
Awaiting Approval	General Plant	C0051815	RTU Replacements Program Phase 6	2025 ACE Plan	2025 ACE Plan	$ 5,959,915		$ 122,712			
Awaiting Approval	Transmission	C0053295	L5004 Kearney Lake Structure Replacement	2025 ACE Plan	2025 ACE Plan	$ 2,478,537		$ 62,940			

NS Power Capital Item Status Update

3rd Quarter Overview - as of September 30, 2024

This report includes all projects submitted to the NSUARB and remain active, as well as ACE Plan subsequent submittal projects. Projects are removed from this report once the project has been final costed (internal or external), cancelled, or falls below $1M.

Status	Category	CI Number	Title	ACE Plan Reference (or U&U and P&A)	Submission/Date	ACE Amount	Submission or Approved Amount	Actual Spend	FIN Submission Date	FIN Amount	Variance
Awaiting Approval	Transmission	C0057682	Spare Transformer Replacement	2025 ACE Plan	2025 ACE Plan	$ 2,286,389		$ 40,726			
Awaiting Approval	Generation	C0068659	TRE5 - IP-LP Turbine Refurbishment	2025 ACE Plan	2025 ACE Plan	$ 1,282,670		$ -			
Awaiting Approval	Distribution	C0068786	2025 Padmount Replacement Program	2025 ACE Plan	2025 ACE Plan	$ 1,354,219		$ -			
Awaiting Approval	Generation	C0068882	TUC1 Generator Refurbishment	2025 ACE Plan	2025 ACE Plan	$ 2,124,211		$ -			
Awaiting Approval	Generation	C0068887	TUC3 Turbine Valves Refurbishment	2025 ACE Plan	2025 ACE Plan	$ 1,869,104		$ -			
Awaiting Approval	Distribution	C0068952	2025 PCB Poletop Sampling and Replacement	2025 ACE Plan	2025 ACE Plan	$ 7,158,974		$ -			
Awaiting Approval	Distribution	C0068953	2025 PCB Light Replacement	2025 ACE Plan	2025 ACE Plan	$ 4,225,224		$ -			
Awaiting Approval	Distribution	C0068954	2025 PCB Downline Device Sampling and Replacement	2025 ACE Plan	2025 ACE Plan	$ 1,716,718		$ -			
Awaiting Approval	Transmission	C0068961	2025 PCB Substation Sampling and Replacement	2025 ACE Plan	2025 ACE Plan	$ 6,650,933		$ -			
Awaiting Approval	Transmission	C0069227	L6516 Replacements and Upgrades Phase 3	2025 ACE Plan	2025 ACE Plan	$ 3,104,925		$ -			
Awaiting Approval	Transmission	C0069231	L8002 Replacements and Upgrades Phase 1	2025 ACE Plan	2025 ACE Plan	$ 3,093,176		$ -			
Awaiting Approval	Transmission	C0069232	L6021 Replacements and Upgrades Phase 1	2025 ACE Plan	2025 ACE Plan	$ 3,253,068		$ -			
Awaiting Approval	Transmission	C0069238	2025/2026 Steel Tower Refurbishment	2025 ACE Plan	2025 ACE Plan	$ 2,337,250		$ -			
Awaiting Approval	General Plant	C0069270	2025 SCADA/EMS Upgrade	2025 ACE Plan	2025 ACE Plan	$ 1,306,288		$ -			
Awaiting Approval	Transmission	C0070048	L5027B Replacements and Upgrades Phase 1	2025 ACE Plan	2025 ACE Plan	$ 2,916,728		$ -			
Awaiting Approval	Distribution	C0070787	91W-411 Labelle Road Phase Extension	2025 ACE Plan	2025 ACE Plan	$ 1,150,616		$ -			
Awaiting Approval	General Plant	C0070907	MDR-8000 Microwave Radio Replacement	2025 ACE Plan	2025 ACE Plan	$ 1,572,478		$ -			
Pending Submission	Generation	48913	HYD - Tusket Facility Refurbishment	2025 ACE Plan (for Subsequent Approval)		$ 12,972,226		$ 510,505			
Pending Submission	Transmission	C0011358	New Bridgewater Substation	2025 ACE Plan (for Subsequent Approval)		$ 18,173,047		$ 24,811			
Pending Submission	Transmission	C0021140	New 138KV-25KV Substation Stellarton	2025 ACE Plan (for Subsequent Approval)		$ 10,511,998		$ 2,553,455			
Pending Submission	General Plant	C0021835	IT - CIS Replacement	2025 ACE Plan (for Subsequent Approval)		$ 77,890,771		$ 1,567,382			
Pending Submission	General Plant	C0032202	Sydney T&D Depot Consolidation	2025 ACE Plan (for Subsequent Approval)		$ 1,879,855		$ -			
Pending Submission	Transmission	C0032382	Susie Lake Substation Addition	2025 ACE Plan (for Subsequent Approval)		$ 13,954,518		$ 245,122			
Pending Submission	Transmission	C0041830	Spare Power Production Unit Transformer	2025 ACE Plan (for Subsequent Approval)		$ 1,264,622		$ 6,689			
Pending Submission	Transmission	C0044391	Eastern Clean Energy Initiative (ECEI) - Transmission	2025 ACE Plan (for Subsequent Approval)		$ 800,229,290		$ 10,219,881			
Pending Submission	General Plant	C0047278	IT - Oracle MDM Upgrade	2025 ACE Plan (for Subsequent Approval)		$ 3,010,689		$ -			
Pending Submission	Transmission	C0053214	76W-T1 Transformer Replacement	2025 ACE Plan (for Subsequent Approval)		$ 2,279,295		$ 34,721			
Pending Submission	General Plant	C0053699	Renewable to Retail Implementation	2025 ACE Plan (for Subsequent Approval)		$ 5,062,652		$ 2,426,337			
Pending Submission	Generation	C0057361	HYD - ANN Facility Isolation	2025 ACE Plan (for Subsequent Approval)		$ 2,899,094		$ 2,406,756			
Pending Submission	Generation	C0059783	HYD Upper Lake Falls 2 Overhaul	2025 ACE Plan (for Subsequent Approval)		$ 1,678,153		$ 443			
Pending Submission	General Plant	C0061284	IT - OT Cyber Security Control Implementation	2025 ACE Plan (for Subsequent Approval)		$ 5,459,313		$ 825,070			
Pending Submission	General Plant	C0061285	IT - Enterprise Governance, Risk and Compliance	2025 ACE Plan (for Subsequent Approval)		$ 1,179,857		$ 200,377			
Pending Submission	Generation	C0061484	PTMT - E-Crane Refurbishment	2025 ACE Plan (for Subsequent Approval)		$ 2,433,081		$ 58,335			
Pending Submission	Transmission	C0061552	L6043 Replacements and Upgrades	2025 ACE Plan (for Subsequent Approval)		$ 1,346,809		$ -			
Pending Submission	General Plant	C0062624	IT - Mobile Field Connectivity Enhancements	2025 ACE Plan (for Subsequent Approval)		$ 1,576,633		$ 288,667			
Pending Submission	Generation	C0063803	HYD AVO 2 Access Road Stabilization	2025 ACE Plan (for Subsequent Approval)		$ 2,406,283		$ 79,006			
Pending Submission	Generation	C0067023	LIN2 2024/25 Capacity Requirement	2025 ACE Plan (for Subsequent Approval)		$ 1,083,800		$ 271,177			
Pending Submission	General Plant	C0067863	IT - Managed Detect & Respond	2025 ACE Plan (for Subsequent Approval)		$ 1,126,413		$ -			
Pending Submission	Generation	C0068566	LIN DCS Upgrade 2025	2025 ACE Plan (for Subsequent Approval)		$ 1,440,911		$ 390			
Pending Submission	Generation	C0068655	LM6000 191-332 Hot Section Refurbishment	2025 ACE Plan (for Subsequent Approval)		$ 6,013,454		$ 85,976			
Pending Submission	General Plant	C0068714	IT - Identity & Access Mangement	2025 ACE Plan (for Subsequent Approval)		$ 1,275,524		$ 73,748			
Pending Submission	General Plant	C0068718	IT - DERMS Solution Project	2025 ACE Plan (for Subsequent Approval)		$ 2,993,200		$ -			
Pending Submission	General Plant	C0068719	IT - Distributed Intelligence Apps	2025 ACE Plan (for Subsequent Approval)		$ 4,353,461		$ -			
Pending Submission	Generation	C0069166	POT-Turbine Valve Refurbishment	2025 ACE Plan (for Subsequent Approval)		$ 2,872,598		$ -			
Pending Submission	Generation	C0070486	HYD LGB Spillway Drawdown	2025 ACE Plan (for Subsequent Approval)		$ 1,288,404		$ -			
Pending Submission	Distribution	C0071528	FLISR Implementation	2025 ACE Plan (for Subsequent Approval)		$ 5,299,248		$ -			
Pending Submission	Transmission	C0072808	Synchronous Condensers (ECEI)	2025 ACE Plan (for Subsequent Approval)		$ 243,807,241		$ -			

NS Power 2024 ACE Plan Items – Deferred or Cancelled
3rd Quarter Overview - as of September 30, 2024
This report includes any deferred or cancelled projects that were included in the 2024 ACE Plan.

CI	Project Title	2024 ACE Amount	2024 ACE Project Total	Cancelled / Deferred	Deferred To	Prior Approval	2024 ACE Plan Reference	ACE 2025 Plan Reference	Commentary
Generation									
C0058543	WRC D-11 By-pass	971,151	971,151	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060546	TUC3 Gen Emergency Degas	347,552	347,552	Deferred	2026		Less than $1M		Deferred to better define project scope. The existing approach to management of this asset is expected to address near term risks.
C0060607	TUC3 Boiler Safety Valves Refurb	479,664	479,664	Deferred	2026		Less than $1M		This project has been deferred to better align with expected procurement and execution timelines for the project. The existing approach to management of this asset is expected to address near term risks.
C0060563	TUC1 Steam Drum Refurb 2024	148,770	148,770	Deferred	2025		Less than $1M	Less than $1M	Deferred to better define project scope. The existing approach to management of this asset is expected to address near term risks.
C0060550	TUC Plant Security Upgrades 2024	194,261	194,261	Deferred	2026		Less than $1M		Deferred due to on-going carry-over work on the 2023 TUC Plant Security Upgrades project. The existing approach to management of this asset is expected to address near term risks.
C0061302	TRE6 - Waterwall Refurbishment (Thermal Panelling Coating)	575,784	627,096	Cancelled					Scope change to replace water wall panels in lieu of applying the protective coating considering the current mission of the boiler.
C0061355	TRE6 - 6A BFP Discharge Valve Refurbishment	104,748	113,704	Deferred	2026		Less than $1M		Deferred due to materials delays from vendor. The existing approach to management of this asset is expected to address near term risks.
C0050795	TRE - Common Water Replacement 2023	29,315	43,093	Deferred	2026		Less than $1M		Deferred due to on-going carry-over work on the 2020 TRE Common Water Replacement project. The existing approach to management of this asset is expected to address near term risks.
C0060784	POT - Oil Cleaner Replacement	86,933	86,933	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0019519	LIN PF Line Replacement	193,534	193,939	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0052254	AMO HYD Hollow Bridge Enhanced Monitoring	192,444	192,444	Deferred	2026		Less than $1M		Deferred due to higher priority work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0050650	CT BGT Unit 3 Vibration Monitoring and protection	61,401	61,764	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060714	CT 191-332 VSV S3-5 Bearing Replace	79,976	79,976	Cancelled			Less than $1M		Replaced by C0063145 CT 191-332 3-5 Bushing Replacement.
C0041511	AMO POT Enhanced Monitoring	198,272	198,272	Deferred	2025		Less than $1M	Less than $1M	Deferred due to higher priority work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060745	PHB - Combustion Analyzer 2024	106,584	106,584	Cancelled					This project is cancelled as it was determined the intent of this project scope can be achieved through CI C0068926 PHB Combustion Analyzer.
C0061845	BGT DC/AC Generator Lube Oil Pumps & Motor Replacement	142,759	142,759	Deferred	2026		Less than $1M		Further scoping determind the condiiton of the asset allowed this project to be deferred to 2025 where it can be completed in conjunction with the planned BGT1 Generator project.
C0061843	CT BGT Roof Refurbishment	39,951	39,951	Deferred	2026		Less than $1M		The condition of the roof is such that minor repairs will avoid the need to complete a full replacement.
C0063546	ICP Rail Track Refurbishment 2024	275,000	275,000	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0054235	LIN CW ACW Strainer Replacement 2024	414,590	471,633	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060164	LIN Boiler Fill Pump Suction Line Replacement	177,548	200,050	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060804	POT - WWTP Acid Injection	265,150	265,150	Deferred	2026		Less than $1M	Less than $1M	During initial scoping, it was determined that further analysis was required to land on the optimal solution.
C0060810	POT - WTP Condensate Polisher Caustic Injection Pump Replacement	75,347	75,347	Cancelled					Replaced by C0067447 POT - PE Condensate Polisher Skid Replacement.
C0061366	TRE6 - Caustic Heater Heat Exchanger	77,217	84,017	Deferred	2025		Less than $1M	Less than $1M	Further scoping of this project determined that the current condition of the Heat Exchanger allowed for this project to be deferred to 2025.
C0061363	TRE5 - Screenwash Pump Replacement	79,139	86,049	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060574	TUC1 Lube Oil/Seal Oil Cooler Replacement	407,010	407,010	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060591	TUC3 Seal Oil Cooler Waterbox	48,955	48,955	Deferred	2026		Less than $1M		This project requires a longer outage than is planned in 2024, and the condiiton allows this to be pushed to 2025 to be completed as part of the major outage in 2025.
C0060590	TUC3 Oil System Refurb 2024	81,048	81,048	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060597	TUC6 Structural Steel Modifications	149,923	149,923	Cancelled					Engineering did further investigation and determined project was not required.
C0061373	TRE - TAMS Offsetting 2024	96,582	105,052	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061331	TRE - HFO Tank Refurbishment (Coating)	317,031	345,031	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0050674	CT BGT Unit 1 Battery Replacement	22,492	48,005	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0055659	ICP Rail Center Fire Protection	134,725	142,142	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060585	TUC3 Deairator Heater Replacement	312,056	312,056	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060586	TUC3 Condenser Waterbox Refurb	397,865	397,865	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0051179	TUC3 - Flow Meter Replacement 203	77,712	77,712	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.

NS Power 2024 ACE Plan Items – Deferred or Cancelled
3rd Quarter Overview - as of September 30, 2024
This report includes any deferred or cancelled projects that were included in the 2024 ACE Plan.

CI	Project Title	2024 ACE Amount	2024 ACE Project Total	Cancelled / Deferred	Deferred To	Prior Approval	2024 ACE Plan Reference	ACE 2025 Plan Reference	Commentary
C0060572	TUC1 Secondary Air & Recirc Damper Replacement	72,720	72,720	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060573	TUC1 Replace WI PLC	145,440	145,440	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060575	TUC1 Lube Oil Purifier Replacement	306,431	306,431	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060559	TUC Permanent Boom	244,001	244,001	Deferred	2026		Less than $1M		Further scoping showed that engineering was required to determine the final project requirements and that the risks could be managed through to 2026.
C0060560	TUC Cooling Water Reduction	47,674	47,674	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060554	TUC Andoamine & Ammoia Pump	104,866	104,866	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
49552	TRE6 Steam Attemperator Replacement	137,669	150,510	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061350	TRE6 - 6B Battery Bank Replacement 2024	135,973	148,682	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0020797	TRE5 4160V Switchgear Room	44,359	44,359	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061523	TRE5 - PA Hot/Cold Air Drive Replacements (PA system)	196,858	214,226	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061348	TRE5 - 5-1/5-2 CW Screen Modifications	37,645	40,845	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061335	TRE - Fish Barrier Screen Upgrades	179,728	196,456	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060783	POT - HVAC Refurbishment 2024	132,009	132,009	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060803	LIN4 SCC Refurbishment 2024	393,224	427,725	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0030122	LIN4 HIP Insulation Replacement	207,167	226,006	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0039666	LIN34 Control Room Refurbishment 2024	145,347	158,144	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061340	LIN12 Diesel Generator Room Refurbishment	327,942	356,688	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061583	LIN1 DC Seal/Lube Oil Motor Cable Fire Wrap	94,573	94,573	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0051597	Turbine Bearings and Lagging Sprinkler Upgrades	132,665	132,665	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0039046	LIN Ash Silo Refurbishment 2024	193,943	210,800	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061264	LIN 600V MCC Refurbishment 2024	57,718	64,491	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0027882	HYD WRC Fire Protection Partial Replacement	89,627	102,299	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060732	CT VJ1 Cooling Tube Replacement	28,920	28,920	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060718	CT VJ Roof Replacement	18,885	18,885	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061503	PHB Bark Pile Moisture Management	86,509	86,509	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060731	CT BGT4 Cooling Tube Replacement	29,072	29,072	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060730	CT BGT3 Cooling Tube Replacement	29,072	29,072	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060729	CT BGT2 Cooling Tube Replacement	28,460	28,460	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060726	CT BGT2 Battery Replacement 2024	47,684	47,684	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060717	CT BGT1 Inverter Replacement	45,028	45,056	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060728	CT BGT1 Cooling Tube Replacement	29,029	29,029	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0061846	BGT Tank 1 Refurb	77,589	77,589	Deferred	2025		Less than $1M	Less than $1M	Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
C0060744	PHB - Precipitator Transformer Replacement 2023	224,782	224,782	Deferred	2026		Less than $1M		Deferred due to unplanned carry-over and U&U capital work utilizing available resources. The existing approach to management of this asset is expected to address near term risks.
Transmission									
C0041822	Wreck Cove Spare Cable Replacement & Storage System	140,862	181,046	Deferred	2025		Less than $1M	Less than $1M	This project has been deferred to better define the overall requirements and complete additional engineering before proceeding. The existing approach to management of this asset is expected to address near term risks.
C0060003	AMO 855 Thermal Camera Upgrade	84,863	84,863	Deferred	2025		Less than $1M	Less than $1M	NS Power is evaluating opportunities to optimize current tools and processes prior to additional investment.

NS Power 2024 ACE Plan Items – Deferred or Cancelled
3rd Quarter Overview - as of September 30, 2024
This report includes any deferred or cancelled projects that were included in the 2024 ACE Plan.

CI	Project Title	2024 ACE Amount	2024 ACE Project Total	Cancelled / Deferred	Deferred To	Prior Approval	2024 ACE Plan Reference	ACE 2025 Plan Reference	Commentary
C0050838	2023 Substation Primary Equipment Spares	273,923	2,026,155	Cancelled			Subsequent Submittal		The risk intended to be mitigated through the purchase of these spares can be managed with current practices through 2025. A new project will be brought forward when this risk can no longer be mitigated through current practices.
C0032382	Susie Lake Substation Addition	2,485,097	2,740,945	Deferred	2025		Subsequent Submittal	Subsequent Submittal	This project has been deferred to better define the overall requirements and complete additional engineering before proceeding.
C0053295	L5004 Kearney Lake Rebuild	1,392,174	1,464,209	Deferred	2025		Subsequent Submittal	Request Approval	This project has been deferred due to higher priority capital work utilizing available line services resources in 2024. Continued monitoring of condition to manage emerging risks through the transmission inspection program will remain in place until this project can be executed.
C0031286	Spare Padmounted Substation	34,010	1,319,838	Deferred	2026		Subsequent Submittal		The risk intended to be mitigated through the purchase of these spare can be managed with current practices through 2025.
C0061552	L6043 Replacements and Upgrades	664,116	1,483,187	Deferred	2025		Subsequent Submittal	Subsequent Submittal	This project has been deferred due to higher priority capital work utilizing available line services resources in 2024. Continued monitoring of condition to manage emerging risks through the transmission inspection program will remain in place until this project can be executed.
C0061544	L6536 Replacements and Upgrades	420,735	420,735	Deferred	2025		Less than $1M	Less than $1M	This project has been deferred due to higher priority capital work utilizing available line services resources in 2024. Continued monitoring of condition to manage emerging risks through the transmission inspection program will remain in place until this project can be executed.
Distribution									
C0043390	664N-211 - Claremont Avenue Conversion	148,578	148,578	Deferred	2026		Less than $1M		This project has been deferred due to higher priority capital work utilizing available line services resources in 2024. Continued monitoring of condition to manage emerging risks through the distribution inspection program will remain in place until this project can be executed.
C0053116	28N-201 Little Forks Road Upgrade and Stepdown Replacement	24,442	709,911	Deferred	2026		Less than $1M		This project has been deferred due to higher priority capital work utilizing available line services resources in 2024. Continued monitoring of condition to manage emerging risks through the distribution inspection program will remain in place until this project can be executed.
C0060756	113H-433G-Route 207 Phase Extension	469,155	507,098	Deferred	2026		Less than $1M		This project has been deferred due to higher priority capital work utilizing available line services resources in 2024. Continued monitoring of condition to manage emerging risks through the distribution inspection program will remain in place until this project can be executed.
C0061103	642V-311-South Rawdon Rd Conversion	429,976	465,051	Deferred	2026		Less than $1M		This project has been deferred due to higher priority capital work utilizing available line services resources in 2024. Continued monitoring of condition to manage emerging risks through the distribution inspection program will remain in place until this project can be executed.
C0060755	637V-Nelson Hill Rd Build to Roadside	137,725	148,837	Deferred	2026		Less than $1M		This project has been deferred due to higher priority capital work utilizing available line services resources in 2024. Continued monitoring of condition to manage emerging risks through the distribution inspection program will remain in place until this project can be executed.
C0060758	2024 Downline PCB Replacements	850,000	850,000	Cancelled			Less than $1M		This project is cancelled as it was determined the intent of this project scope can be achieved through CI C0068954 2025 PCB Downline Device Sampling and Replacement.
General Plant									
C0031176	IT- PortOps Upgrade	38,250	51,738	Cancelled			Less than $1M		During the preliminary engineering process, it was determimed this scope of work for PortOps is no longer required at this time.
C0061347	IT - Wireless Video Solution	68,550	89,550	Deferred	2025		Less than $1M	Less than $1M	This project has been deferred due to higher priority carryover work using available resources in 2024. Existing approach to management of this asset is expected to meet near term requirements.
C0061287	IT - Third Party Risk Management	1,105,970	1,405,970	Deferred	2026		Subsequent Submittal		This project has been deferred due to higher priority carryover work using available resources in 2024. Existing approach to management of this asset is expected to meet near term requirements.
C0061332	IT - Sharepoint Migration of Corporate Drives	46,144	58,144	Deferred	2026		Less than $1M		This project has been deferred due to higher priority carryover work using available resources in 2024. Existing approach to management of this asset is expected to meet near term requirements.
C0062043	IT - Record Information Management System Implementation	523,789	523,789	Cancelled			Less than $1M		This project is cancelled as it was determined the intent of this project scope can be achieved through CI C0047290 SharePoint 2016 Upgrade.
C0061288	IT - Physical Controls and Measure Review	202,698	909,847	Cancelled			Less than $1M		This project is cancelled as it was determined the intent of this project scope can be achieved through CI C0049615 IT - Physical Security Devices.
C0061297	IT - Implement Network Segmentation	448,992	583,992	Cancelled			Less than $1M		This project is cancelled as it was determined the intent ofthis project scope can be achieved through CI C0061289 IT - Network Next Generation Security.
C0049012	IT - Grid Analytics	155,967	243,622	Deferred	2026		Less than $1M		This project has been deferred due to higher priority carryover work using available resources in 2024. Existing approach to management of this asset is expected to meet near term requirements.
C0042151	Lifecycle: Expand Network Core	229,440	289,440	Cancelled			Less than $1M		This project is cancelled as it was determined the intent of this project scope can be achieved through CI C0061301 IT - Cisco ACI Network Core Expansion.
C0061296	IT - Endpoint Remote Solution	22,076	28,076	Deferred	2026		Less than $1M		This project has been deferred due to higher priority carryover work using available resources in 2024. Existing approach to management of this asset is expected to meet near term requirements.
C0061330	IT - BCP Design and Roadmap	90,459	117,459	Deferred	2026		Less than $1M		This project has been deferred due to higher priority carryover work using available resources in 2024. Existing approach to management of this asset is expected to meet near term requirements.
C0061299	IT - SOA Upgrade	141,294	183,294	Deferred	2026		Less than $1M		Deferred to better define project scope and requirements. Existing approach to management of this asset is expected to meet near term requirements.
C0051815	2024 RTU Replacements Program	2,331,325	5,735,653	Deferred	2025		Subsequent Submittal	Request Approval	This project has been deferred due to higher priority carryover work using available resources in 2024. Existing approach to management of this asset is expected to meet near term requirements.
C0047290	IT - Sharepoint 2016 Upgrade	183,190	233,190	Cancelled			Less than $1M		Final project scoping determined that this initiative would be completed as part of C0062043 IT - RIMS Information Management in 2025.

NS Power Final Cost Report

3rd Quarter Overview - as of September 30, 2024

This report includes a list of all FIN capital work orders that have fallen outside the timelines under the CEJC. (Within six months of in-service.)
These projects have either been completed and are outside the FIN tolerances or forecast to be outside of the FIN tolerances. (The greater of +/- 5% or +/- $250,000.)
Projects that have been in-service for 6 months, but have a project forecast within the allowed FIN tolerance, are not included on this list.

Project #	Project	In-service Date	NSUARB Approval	Spend to September 30, 2024	Comment
C0041810	L5022 Replacements and Upgrades	6/30/2022	2,172,200	1,618,003	This project is now complete and a Final Cost Application is planned for submission in late 2024 to early 2025.
C0017098	RAL Generator Replacement	12/31/2019	2,229,267	1,651,133	Project completion under review. Scope change from original approved CWO.
C0031145	2021 Padmount Replacement Program	3/31/2021	1,636,153	1,166,806	This project is now complete and a Final Cost Application is planned for submission in 2025.
51956	6P Mobile Substation Rewind	1/31/2019	1,516,121	1,056,956	This project is now complete and a Final Cost Application is planned for submission in 2025.
C0041796	L6020 Replacements and Upgrades Phase 2	8/31/2022	2,518,243	3,281,196	FIN CWO submitted to the NSUARB on October 11, 2024.
C0020385	LIN Heavy Fuel Oil Tank Refurbishment	8/31/2023	3,396,731	2,805,664	This project is now complete and a Final Cost Application is planned for submission in late 2024 to early 2025.
C0021106	L7005 Replacements and Upgrades Phase 1	6/30/2021	3,576,991	3,136,424	FIN CWO submitted to the NSUARB on August 6, 2024.
51406	2018/2019 Transmission Switch & Breaker Replacement	12/31/2018	1,405,891	1,136,173	This project is now complete and a Final Cost Application is planned for submission in late 2024 to early 2025.
49790	L5505 Replacements and Upgrades	5/31/2020	1,223,571	815,759	This project is now complete and a Final Cost Application is planned for submission in 2025.
C0041805	L7005 Replacements and Upgrades Phase 2	9/30/2022	3,182,518	2,909,294	This project is now complete and a Final Cost Application is planned for submission in 2025.
52314	1C-GT1/UT1 Replacement	11/30/2020	2,032,393	1,678,006	This project is now complete and a Final Cost Application is planned for submission in 2025.

					Original Submission Amounts			Actual Amounts				
Filing Type	CI Number	Project Title	Function Class	Status	Estimated In-Service Date	Approved Estimate	Contingency on Approved Estimate	Actual In-Service Date	Actual Spend (as of 09/30/2024)	Variance to Approved Estimate	Variance Percentage
2015	**44987**	**L7003 Lidar Upgrades**	**Transmission Plant - T**	**In-service Complete**	**12/1/2015**	**11,032,275**	**794,974**	**3/31/2016**	**10,905,774**	**(126,501)**	**-1%**
2015 ACE Plan	44716	TUC2 North Boiler Feedwater Pump Refurbishment	Steam Generation Plant - S	Complete - Final Costed	3/15/2017	191,007	-	5/31/2019	784,759	593,752	311%
2016	**47551**	**HYD - SHH Controls Upgrade**	**Hydro Generation Plant - H**	**In-service Complete**	**4/30/2017**	**1,749,212**	**213,496**	**2/28/2022**	**1,965,328**	**216,116**	**12%**
2016 ACE Plan	47933	LIN4 Turbine Vibration Monitoring Upgrade	Steam Generation Plant - S	Complete - Final Costed	6/19/2016	238,216	-	6/30/2016	291,238	53,022	22%
2016 ACE Plan	47756	36V-303 Reconductor Middle Dyke Rd	Distribution Plant - D	Complete - Final Costed	1/31/2017	226,303	9,878	1/30/2017	287,678	61,375	27%
2016 ACE Plan	47947	TUC6 Condenser Waterbox Coating Replacement	Steam Generation Plant - S	Complete - Final Costed	10/26/2016	225,210	-	10/28/2016	368,637	143,427	64%
2016 ACE Plan	47606	TRE5 Sootblower Controls Upgrade	Steam Generation Plant - S	Complete - Final Costed	12/15/2016	158,399	-	12/31/2016	286,649	128,251	81%
2016 ACE Plan	47874	LIN Ash Scale Replacement	Steam Generation Plant - S	Complete - Final Costed	10/31/2017	237,241	-	6/30/2017	520,573	283,333	119%
2016 ACE Plan	48111	East Switch Upgrades 15S	Transmission Plant - T	Complete - Final Costed	8/31/2017	122,220	8,400	7/31/2019	290,265	168,045	137%
2016 ACE Plan	47600	TRE Asbestos Abatement (2016)	Steam Generation Plant - S	Complete - Final Costed	12/15/2016	154,303	-	11/29/2016	2,088,671	1,934,368	1254%
2017	49499	PHB - Boiler Refurbishment 2017	Steam Generation Plant - S	Complete - Final Costed	8/31/2017	593,740	50,552	8/4/2017	401,915	(191,825)	-32%
2017	49438	LIN A Gallery Floor Replacement	Steam Generation Plant - S	Complete - Final Costed	11/16/2017	591,761	44,548	8/31/2017	404,299	(187,462)	-32%
2017	47648	HYD - Lequille Pipeline Replacement	Hydro Generation Plant - H	Complete - Final Costed	9/30/2017	1,121,253	194,400	12/15/2017	925,167	(196,087)	-17%
2017	38931	HYD Harmony Stabilization	Hydro Generation Plant - H	Complete - Final Costed	1/30/2018	931,942	112,492	10/31/2017	777,750	(154,192)	-17%
2017	44776	TUC#5 LM6000 Generator Stator Re-wedge	Gas Turbine Generation Plant - G	Complete - Final Costed	8/31/2017	1,361,301	106,055	8/31/2017	1,213,520	(147,781)	-11%
2017	49273	BGT2 Engine Refurbishment	Gas Turbine Generation Plant - G	Complete - Final Costed	10/31/2017	2,170,157	98,005	11/30/2017	1,981,224	(188,933)	-9%
2017	49039	HYD Lequille Controls Upgrades	Hydro Generation Plant - H	Complete - Final Costed	9/30/2017	762,912	117,200	3/30/2018	722,822	(40,090)	-5%
2017	49596	HYD - Hells Gate 2 Overhaul	Hydro Generation Plant - H	Complete - Final Costed	11/30/2017	1,204,263	150,476	2/20/2018	1,144,529	(59,734)	-5%
2017	47682	HYD Lequille Switchgear Replacement	Hydro Generation Plant - H	Complete - Final Costed	10/31/2017	776,391	91,199	3/22/2018	739,474	(36,916)	-5%
2017	51052	TRE6 Generator High Voltage Bushings Critical Spare	Steam Generation Plant - S	Complete - Final Costed	8/15/2017	264,250	-	1/17/2018	265,783	1,533	1%
2017	46499	Stator Rewind Kit Capital Spare	Steam Generation Plant - S	Complete - Final Costed	3/4/2018	2,871,003	-	8/17/2018	2,917,466	46,462	2%
2017	47654	HYD - Gulch Penstock & Surge Tank Replacement	Hydro Generation Plant - H	Complete - Final Costed	11/15/2017	4,970,542	597,463	4/18/2018	5,067,474	96,931	2%
2017	49857	IT - Storage Infrastructure Upgrade	General Plant - P	Complete - Final Costed	2/28/2018	1,901,189	88,961	5/31/2018	1,954,220	53,032	3%
2017	43202	Replace Mobile Radio System	General Plant - P	Complete - Final Costed	7/31/2017	6,296,878	407,840	2/1/2018	6,498,994	202,115	3%
2017	47531	TRE6 LP Turbine Diaphragm Tip Seal Replacement	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	1,704,784	-	11/15/2017	1,784,166	79,382	5%
2017	48396	HYD Bridge Remediation	Hydro Generation Plant - H	Complete - Final Costed	12/30/2017	677,591	40,615	12/1/2018	714,834	37,243	5%
2017	47553	TRE6 Turbine Valve Refurbishment	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	570,600	22,480	11/14/2017	601,996	31,396	6%
2017	49860	IT - Sharepoint Upgrade	General Plant - P	Complete - Final Costed	7/1/2018	3,903,594	333,223	2/26/2019	4,141,059	237,465	6%
2017	48773	VOIP Expansion	General Plant - P	Complete - Final Costed	1/31/2018	1,708,923	153,459	1/1/2018	1,837,566	128,643	8%
2017	49953	IT - CIS High Availability	General Plant - P	Complete - Final Costed	12/31/2017	519,023	64,771	6/18/2018	560,760	41,737	8%
2017	49538	TRE6 Generator Rotor Flux Probe Installation	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	784,610	-	11/15/2017	852,045	67,435	9%
2017	49787	Intelligent Feeder Project	General Plant - P	Complete - Final Costed	9/30/2017	2,782,384	-	1/31/2018	3,032,089	249,705	9%
2017	47760	8SS-402 Re-Insulate	Distribution Plant - D	Complete - Final Costed	8/31/2018	1,551,859	101,256	3/31/2017	1,700,924	149,066	10%
2017	47786	129H Kearney Lake Load Transfer	Distribution Plant - D	Complete - Final Costed	10/30/2017	286,280	-	2/28/2018	315,886	29,606	10%
2017	51053	TRE6 HIP Turbine Diaphragm Partition Refurbishment	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	1,185,445	-	11/15/2017	1,313,762	128,317	11%
2017	48893	TUC3 IP Turbine Refurbishment	Steam Generation Plant - S	Complete - Final Costed	12/1/2017	4,871,454	-	1/31/2018	5,466,520	595,066	12%
2017	50341	2017 Substation Recloser Replacements	Distribution Plant - D	Complete - Final Costed	5/30/2017	604,889	49,695	1/10/2017	720,013	115,124	19%
2017	50295	Electric Vehicle Infrastructure Deployment	General Plant - P	Complete - Final Costed	3/31/2018	419,908	-	6/15/2018	509,295	89,387	21%
2017	49598	HYD - Gisborne Switchgear Replacmnt	Hydro Generation Plant - H	Complete - Final Costed	6/30/2017	747,450	90,525	2/6/2020	914,413	166,964	22%
2017	49111	POT Air Heater Refurbishment	Steam Generation Plant - S	Complete - Final Costed	5/30/2017	272,538	23,538	6/1/2017	363,699	91,161	33%
2017	44749	Tiverton Tower Replacement	Distribution Plant - D	Complete - Final Costed	10/31/2018	1,465,132	81,415	6/30/2019	2,174,543	709,410	48%
2017	49674	TUC2 Boiler Selective Waterwall Tube Replacements	Steam Generation Plant - S	Complete - Final Costed	5/30/2017	421,518	-	6/30/2017	656,906	235,388	56%
2017	49929	Tap Changer Replacements	Transmission Plant - T	Complete - Final Costed	6/30/2017	318,236	15,513	10/31/2017	518,589	200,353	63%
2017	47876	HYD - Lequille Overhaul	Hydro Generation Plant - H	Complete - Final Costed	11/30/2017	1,395,229	111,626	3/22/2018	2,378,233	983,004	70%
2017	49922	Western Switching Upgrades	Transmission Plant - T	Complete - Final Costed	8/30/2017	378,843	29,475	6/30/2018	650,674	271,831	72%
2017	**51956**	**6P Mobile Substation Rewind**	**Transmission Plant - T**	**In-service Complete**	**5/30/2018**	**1,516,121**	**115,020**	**1/31/2019**	**1,056,956**	**(459,165)**	**-30%**
2017	49855	IT - Desktop SW Modernization	General Plant - P	In-service Complete	1/31/2018	4,620,516	481,610	1/31/2018	4,501,621	(118,895)	-3%
2017	50153	Customer Experience Self-Serve Development Phase 2	General Plant - P	In-service Complete	6/30/2018	1,160,528	142,122	6/15/2018	1,316,269	155,741	13%
2017	47787	2H Armdale New Feeders	Distribution Plant - D	In-service Complete	11/30/2017	988,498	42,628	2/29/2020	1,723,920	735,423	74%
2017	49928	3S Gannon Road – Bus Reconfiguration	Transmission Plant - T	In-service Complete	12/30/2017	371,395	27,372	10/1/2017	835,572	464,177	125%
2017 ACE Plan	49798	2017 / 2018 Capacitor Bank Breaker Replacements	Transmission Plant - T	Complete - Final Costed	4/1/2018	378,150	26,923	6/30/2017	209,820	(168,329)	-45%
2017 ACE Plan	49878	2017 Substation Insulator Replacement Program	Transmission Plant - T	Complete - Final Costed	2/15/2017	508,893	34,971	3/31/2017	353,315	(155,578)	-31%
2017 ACE Plan	47956	L7004 Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	9/28/2017	672,131	42,872	7/31/2017	481,723	(190,408)	-28%
2017 ACE Plan	49833	2017 Oil Containment Program	Transmission Plant - T	Complete - Final Costed	11/1/2017	432,518	34,525	12/31/2017	339,360	(93,159)	-22%
2017 ACE Plan	48535	HYD Scragg Lake Dam and Spillway Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	10/30/2017	1,956,298	227,841	11/30/2017	1,625,672	(330,626)	-17%
2017 ACE Plan	49776	L7008 Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	9/13/2017	876,277	50,528	8/31/2017	733,884	(142,393)	-16%
2017 ACE Plan	49821	Mersey River Hydro Spare Transformer	Transmission Plant - T	Complete - Final Costed	3/1/2018	519,994	44,006	10/31/2018	439,280	(80,715)	-16%
2017 ACE Plan	49437	LIN Vacuum Pump Cooler Refurbishment	Steam Generation Plant - S	Complete - Final Costed	9/16/2017	282,034	17,400	12/15/2017	238,601	(43,433)	-15%
2017 ACE Plan	47769	509V-301 Overcove Rd Replacements	Distribution Plant - D	Complete - Final Costed	5/31/2017	402,493	28,300	2/28/2018	360,036	(42,458)	-11%
2017 ACE Plan	49799	532N Elm Street Conversion Phase 1	Distribution Plant - D	Complete - Final Costed	6/30/2017	548,688	28,106	1/31/2018	525,501	(23,187)	-4%
2017 ACE Plan	49836	11S-302 11S-401 Rebuild Coxheath Phase 2	Distribution Plant - D	Complete - Final Costed	4/1/2017	807,456	53,550	12/29/2017	774,528	(32,928)	-4%
2017 ACE Plan	49434	LIN CW Screen Refurbishment 2017	Steam Generation Plant - S	Complete - Final Costed	10/16/2017	347,062	-	8/31/2017	334,390	(12,672)	-4%
2017 ACE Plan	49880	Meter Shop Test Console Replacement	General Plant - P	Complete - Final Costed	2/15/2017	410,457	-	11/30/2017	400,133	(10,324)	-3%
2017 ACE Plan	49057	TRE6 Excitation System Replacement	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	904,011	84,695	11/30/2017	893,489	(10,522)	-1%
2017 ACE Plan	49806	2017 Padmount Replacement Program	Distribution Plant - D	Complete - Final Costed	1/20/2017	1,703,774	129,960	4/30/2017	1,719,177	15,403	1%
2017 ACE Plan	49861	IT - PI System Upgrade	General Plant - P	Complete - Final Costed	12/31/2017	801,253	64,155	7/21/2018	814,726	13,473	2%
2017 ACE Plan	49992	2017 Transmission Right of Way Widening	Transmission Plant - T	Complete - Final Costed	12/30/2017	5,400,855	-	1/1/2017	5,494,423	93,568	2%
2017 ACE Plan	49902	2017 Telecom Building Replacement - Wittenburg	General Plant - P	Complete - Final Costed	12/30/2017	294,000	18,550	5/31/2018	301,948	7,948	3%
2017 ACE Plan	48631	HYD - Gulch Spillway Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	10/30/2017	617,034	72,153	10/25/2018	637,103	20,069	3%
2017 ACE Plan	49792	2017 Transmission Line Retirement Program	Transmission Plant - T	Complete - Final Costed	3/1/2017	526,064	37,660	6/1/2017	544,382	18,318	3%
2017 ACE Plan	49535	TRE6 Mills Refurbishment 2017	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	822,141	47,605	11/14/2017	860,580	38,439	5%
2017 ACE Plan	49838	2017/2018 Substation Polychlorinated Biphenyl (PCB) Equipment Removal Program	Transmission Plant - T	Complete - Final Costed	3/1/2017	4,127,023	335,210	4/30/2017	4,334,512	207,489	5%
2017 ACE Plan	47953	LIN Railcar Positioner Refurbishment	Steam Generation Plant - S	Complete - Final Costed	9/20/2017	566,619	-	10/31/2017	607,545	40,926	7%
2017 ACE Plan	49532	TRE6 Air Heater Refurbishment	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	1,428,236	60,066	11/14/2017	1,548,759	120,523	8%
2017 ACE Plan	49430	LIN CW Pump Refurbishment 2017	Steam Generation Plant - S	Complete - Final Costed	6/16/2017	516,270	-	6/22/2017	560,231	43,962	9%
2017 ACE Plan	47893	TUC3 PE Generator Hydrogen Panel Replacement	Steam Generation Plant - S	Complete - Final Costed	10/12/2017	423,798	-	12/15/2017	468,010	44,211	10%
2017 ACE Plan	49789	L6515 Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	9/30/2017	2,340,989	152,937	6/30/2017	2,590,653	249,664	11%
2017 ACE Plan	49918	S4H-303 Underground Device Replacements Phase I	Distribution Plant - D	Complete - Final Costed	12/30/2017	469,604	-	7/31/2017	521,501	51,897	11%
2017 ACE Plan	49814	2017 / 2018 Steel Tower Life Extension	Transmission Plant - T	Complete - Final Costed	6/1/2017	1,462,100	103,000	6/1/2017	1,643,871	181,771	12%
2017 ACE Plan	50073	4S-332 Bernard Lind Drive Conversion	Distribution Plant - D	Complete - Final Costed	7/1/2017	302,893	15,284	11/30/2017	345,727	42,834	14%
2017 ACE Plan	49813	2017 Sacrificial Anode Installation Program	Transmission Plant - T	Complete - Final Costed	1/31/2017	1,532,340	105,000	3/31/2017	1,749,977	217,637	14%
2017 ACE Plan	49431	LIN Mill Refurbishment 2017	Steam Generation Plant - S	Complete - Final Costed	10/16/2017	665,839	-	6/22/2017	763,974	98,135	15%
2017 ACE Plan	49774	L5527 Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	6/30/2017	1,537,852	96,401	5/31/2018	1,784,759	246,907	16%
2017 ACE Plan	49533	TRE6 Boiler Refurbishment	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	1,259,454	-	11/14/2017	1,490,498	231,045	18%
2017 ACE Plan	49867	55V-313-Berwick North Replacements	Distribution Plant - D	Complete - Final Costed	10/30/2017	345,565	16,882	2/2/2018	417,926	72,361	21%
2017 ACE Plan	49419	POT Boiler Refurbishment 2017	Steam Generation Plant - S	Complete - Final Costed	6/30/2017	969,292	82,805	6/5/2017	1,180,397	211,105	22%
2017 ACE Plan	49537	TRE6 Analytical Panel Upgrade	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	438,216	37,764	8/15/2019	534,927	96,711	22%
2017 ACE Plan	49948	2017/2018 Isolated Structure Replacements	Transmission Plant - T	Complete - Final Costed	10/30/2017	3,822,487	264,287	11/1/2017	4,813,197	990,710	26%
2017 ACE Plan	49427	LIN Coal Plant Structural Refurbishment Phase 3	Steam Generation Plant - S	Complete - Final Costed	8/16/2017	365,003	-	9/18/2017	466,204	101,201	28%
2017 ACE Plan	48774	HYD - Milton Shop HVAC Upgrade	Hydro Generation Plant - H	Complete - Final Costed	10/31/2017	564,347	98,240	8/20/2018	721,810	157,463	28%
2017 ACE Plan	49536	TRE5 Boiler Refurbishments 2017	Steam Generation Plant - S	Complete - Final Costed	5/15/2017	717,589	60,017	5/8/2017	925,492	207,903	29%
2017 ACE Plan	48057	Replace 69kV cables between 2S and 83S	Transmission Plant - T	Complete - Final Costed	10/1/2017	459,931	36,585	10/31/2019	598,079	138,148	30%
2017 ACE Plan	41511	TRE6 - Condenser Waterbox and Cooling Water Piping Refurbishment	Steam Generation Plant - S	Complete - Final Costed	9/15/2017	700,809	51,878	12/1/2017	949,194	248,385	35%
2017 ACE Plan	49782	L5027B Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	4/14/2017	1,093,542	74,727	12/31/2017	1,532,096	438,554	40%
2017 ACE Plan	49675	TUC2 Cooling Water Piping Refurbishment	Steam Generation Plant - S	Complete - Final Costed	6/30/2017	568,673	-	6/30/2017	812,353	243,680	43%
2017 ACE Plan	47597	TRE6 Bottom Ash Chain Replacement	Steam Generation Plant - S	Complete - Final Costed	10/15/2017	793,792	12,303	11/14/2017	1,159,004	365,212	46%
2017 ACE Plan	49463	POT Coal Mill Overhauls 2017	Steam Generation Plant - S	Complete - Final Costed	7/30/2017	328,410	40,597	12/14/2017	501,140	172,730	53%
2017 ACE Plan	50071	T&D Inspection Application Upgrade Phase 1	General Plant - P	Complete - Final Costed	9/30/2017	411,191	24,170	1/31/2018	652,957	241,766	59%
2017 ACE Plan	49866	512N-Toney River Replacements	Distribution Plant - D	Complete - Final Costed	11/3/2017	285,219	-	12/29/2017	453,402	168,182	59%
2017 ACE Plan	47687	POT Boiler Chemical Reconditioning	Steam Generation Plant - S	Complete - Final Costed	6/30/2017	974,604	81,610	6/5/2017	1,588,495	613,891	63%
2017 ACE Plan	49707	TUC2 Generator Bushing Replacement	Steam Generation Plant - S	Complete - Final Costed	7/25/2017	440,082	-	6/15/2018	726,401	286,319	65%
2017 ACE Plan	49791	3N Oxford Conversion Phase 3	Distribution Plant - D	Complete - Final Costed	3/1/2017	358,369	-	3/31/2017	604,785	246,416	69%

					Original Submission Amounts			Actual Amounts			
Filing Type	CI Number	Project Title	Function Class	Status	Estimated In-Service Date	Approved Estimate	Contingency on Approved Estimate	Actual In-Service Date	Actual Spend (as of 09/30/2024)	Variance to Approved Estimate	Variance Percentage
2017 ACE Plan		49591 3S Feeder Exit Cable Replacement	Distribution Plant - D	Complete - Final Costed	9/30/2017	335,842	-	12/31/2017	581,561	245,719	73%
2017 ACE Plan		49433 LIN1 SH5 Boiler Tube Replacement	Steam Generation Plant - S	Complete - Final Costed	5/16/2017	493,396	-	6/22/2017	930,561	437,165	89%
2017 ACE Plan		49862 50N-410 Rebuild Trenton	Distribution Plant - D	Complete - Final Costed	6/30/2017	247,773	15,996	7/31/2017	486,542	238,769	96%
2017 ACE Plan		49553 TRE Asbestos Abatement 2017	Steam Generation Plant - S	Complete - Final Costed	7/15/2017	226,451	-	8/2/2017	684,184	457,733	202%
2017 ACE Plan		49693 TUC HFO Tank Dyke Piping Refurbishments	Steam Generation Plant - S	Complete - Final Costed	12/30/2017	219,022	-	12/15/2017	884,473	665,451	304%
2017 ACE Plan		50020 LIN CEMS Replacement	Steam Generation Plant - S	Complete - Final Costed	9/30/2017	170,281	-	10/31/2018	689,032	518,750	305%
2017 ACE Plan		49551 TRE5 CEMS Replacement	Steam Generation Plant - S	Complete - Final Costed	11/15/2017	162,647	-	5/11/2018	759,657	597,009	367%
2017 ACE Plan		47915 L5053 Replacements and Upgrades	Transmission Plant - T	In-service Complete	6/30/2017	692,706	44,651	8/31/2018	421,997	(270,709)	-39%
2017 ACE Plan		49790 L5505 Replacements and Upgrades	Transmission Plant - T	In-service Complete	3/15/2017	1,223,571	75,417	5/31/2020	818,203	(405,368)	-33%
2017 ACE Plan		46572 2017 RTU Replacement Program	General Plant - P	In-service Complete	10/1/2017	693,354	47,984	7/31/2019	585,319	(108,035)	-16%
2017 ACE Plan		49841 23H-Rockingham Voltage Conversion-Phase 2	Distribution Plant - D	In-service Complete	6/1/2017	743,213	-	12/31/2017	660,527	(82,686)	-11%
2017 ACE Plan		49815 2017 / 2018 Steel Tower Refurbishment	Transmission Plant - T	In-service Complete	2/28/2017	2,003,317	143,733	2/28/2017	1,937,433	(65,884)	-3%
2017 ACE Plan		47954 L7012 Replacements and Upgrades	Transmission Plant - T	In-service Complete	9/30/2017	4,428,520	292,352	8/1/2017	4,392,086	(36,434)	-1%
2017 ACE Plan		49775 L5004 Replacements and Upgrades	Transmission Plant - T	In-service Complete	3/13/2017	995,712	63,953	2/1/2017	1,008,657	12,945	1%
2017 ACE Plan		49818 2017/2018 Transmission Switch & Breaker Replacement	Transmission Plant - T	In-service Complete	4/30/2017	1,074,472	81,794	1/31/2018	1,096,991	22,519	2%
2017 ACE Plan		49891 509V Recloser and Voltage Regulator Replacement	Distribution Plant - D	In-service Complete	11/1/2017	319,649	12,091	12/31/2017	330,066	10,418	3%
2017 ACE Plan		49919 2017 PCB Pole Top Transformer Replacement	Distribution Plant - D	In-service Complete	1/30/2017	2,446,051	188,449	3/31/2017	2,545,893	99,842	4%
2017 ACE Plan		49897 POT - Fire System Upgrades 2017	Steam Generation Plant - S	In-service Complete	10/30/2017	538,437	46,163	12/12/2022	630,649	92,213	17%
2017 ACE Plan		49793 L7011 Replacements and Upgrades	Transmission Plant - T	In-service Complete	6/1/2017	3,343,484	206,757	6/1/2017	4,591,706	1,248,222	37%
2017 ACE Plan		49466 PTMT - Dock and Inhaul Conveyor Replacement	Steam Generation Plant - S	In-service Complete	7/1/2017	467,607	42,068	12/22/2017	928,290	460,683	99%
2017 ACE Plan		49778 L5535 Replacements and Upgrades	Transmission Plant - T	In-service Complete	12/14/2017	1,261,920	79,260	9/28/2017	2,837,177	1,575,257	125%
2018	C0002241	IT – Generation Operations Upgrade	General Plant - P	Complete - Final Costed	2/28/2019	565,466	88,765	10/25/2019	383,086	(182,380)	-32%
2018		51481 IT - Content Management System Replacement	General Plant - P	Complete - Final Costed	7/31/2019	2,213,246	326,562	11/26/2019	2,193,507	(19,739)	-1%
2018		51775 HYD Fixed Ladder & Machine Guard Upgrades	Hydro Generation Plant - H	Complete - Final Costed	12/31/2018	1,985,179	152,957	5/31/2022	2,088,683	103,504	5%
2018		52143 LM6000 - 191-332 Hot Section and Engine Refurbishment	Gas Turbine Generation Plant - G	Complete - Final Costed	11/30/2019	3,140,533	283,503	8/9/2019	3,364,401	223,868	7%
2018		52107 TUC6 CW Screen Replacement	Steam Generation Plant - S	Complete - Final Costed	12/30/2018	856,984	46,607	9/14/2018	1,058,298	201,313	23%
2018		48837 AMO Fleet Environmental Data Management	General Plant - P	Complete - Final Costed	3/31/2019	423,356	38,487	1/1/2022	991,514	568,158	134%
2018		51808 TUC HFO Piping Refurbishment	Steam Generation Plant - S	Complete - Final Costed	11/30/2018	1,239,933	187,656	12/31/2018	3,666,539	2,426,607	196%
2018		49940 LM6000 TUC5 Control System Upgrade	Gas Turbine Generation Plant - G	In-service Complete	12/31/2019	1,275,559	197,236	4/15/2021	1,070,506	(205,053)	-16%
2018		49926 LM6000 TUC4 Airhouse Upgrade	Gas Turbine Generation Plant - G	In-service Complete	7/31/2019	987,141	157,050	6/28/2019	904,422	(82,719)	-8%
2018	C0013438	IT - T&D WAM Phase 1 - GIS and Field Design System	General Plant - P	In-service Complete	9/30/2019	7,978,434	1,300,667	12/15/2019	8,098,223	119,789	2%
2018		49594 LM6000 TUC5 Airhouse upgrade	Gas Turbine Generation Plant - G	In-service Complete	8/31/2019	980,668	156,929	7/25/2019	1,053,624	72,957	7%
2018 ACE Plan		49534 TRE6 EHG/Turbine Controls Upgrade	Steam Generation Plant - S	Complete - Final Costed	11/15/2018	2,725,344	51,416	8/15/2019	1,255,107	(1,470,237)	-54%
2018 ACE Plan		51807 TUC2 Boiler Lower Vestibule Refurbishment	Steam Generation Plant - S	Complete - Final Costed	6/6/2018	412,872	25,114	6/29/2018	193,683	(219,189)	-53%
2018 ACE Plan		49547 TRE5 5-1 BFP Refurbishment	Steam Generation Plant - S	Complete - Final Costed	6/15/2018	345,523	23,628	9/14/2018	190,208	(155,314)	-45%
2018 ACE Plan		52206 20V-311-Bishop Ville Rd	Distribution Plant - D	Complete - Final Costed	8/31/2018	303,533	17,367	10/31/2018	167,853	(135,680)	-45%
2018 ACE Plan		51857 TRE5 Burner Refurbishments 2018	Steam Generation Plant - S	Complete - Final Costed	6/15/2018	332,497	27,571	9/14/2018	214,410	(118,088)	-36%
2018 ACE Plan		51405 2018 Wood Pole Retreatment Program	Transmission Plant - T	Complete - Final Costed	5/31/2018	1,361,076	97,480	6/30/2018	924,521	(436,555)	-32%
2018 ACE Plan		52207 678H-211 McNab's Island Replacement	Distribution Plant - D	Complete - Final Costed	3/31/2019	350,176	26,624	7/31/2018	263,145	(87,031)	-25%
2018 ACE Plan		52241 16V-T2 Weymouth Hydro Transformer Replacement	Transmission Plant - T	Complete - Final Costed	12/31/2018	889,253	67,694	11/30/2018	674,829	(214,424)	-24%
2018 ACE Plan		52093 ICP Rail Crossing Refurbishment	Steam Generation Plant - S	Complete - Final Costed	8/20/2018	592,402	50,144	9/5/2018	450,582	(141,821)	-24%
2018 ACE Plan		51972 HYD Nictaux Canal Embank Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	8/31/2018	789,918	69,141	9/13/2019	601,443	(188,475)	-24%
2018 ACE Plan		51851 LIN CW Screen Refurbishment 2018	Steam Generation Plant - S	Complete - Final Costed	10/21/2018	350,534	-	10/31/2018	306,646	(43,887)	-13%
2018 ACE Plan		52267 16W-302H-Brenton Rd Rebuild	Distribution Plant - D	Complete - Final Costed	4/28/2019	387,767	28,642	12/13/2018	344,278	(43,488)	-11%
2018 ACE Plan		51862 TRE6 Lube Oil Cooler Refurbishment	Steam Generation Plant - S	Complete - Final Costed	9/15/2018	341,769	29,721	9/1/2020	307,870	(33,899)	-10%
2018 ACE Plan		51500 2018 Pin Insulator Replacements	Distribution Plant - D	Complete - Final Costed	1/1/2018	350,100	20,156	6/30/2019	321,249	(28,851)	-8%
2018 ACE Plan		52271 2018 Padmount Replacement	Distribution Plant - D	Complete - Final Costed	1/25/2018	1,657,205	135,231	2/28/2018	1,571,077	(86,128)	-5%
2018 ACE Plan		49033 HYD WRC Tunnel T-2 Intake Replacement	Hydro Generation Plant - H	Complete - Final Costed	10/31/2018	2,851,582	367,813	11/22/2018	2,759,407	(92,175)	-3%
2018 ACE Plan		51804 LIN3&4 ACW Duplex Strainer Replacement	Steam Generation Plant - S	Complete - Final Costed	8/21/2018	333,808	34,800	6/24/2019	327,212	(6,596)	-2%
2018 ACE Plan		51969 2018 Transmission ROW Widening 69kV	Transmission Plant - T	Complete - Final Costed	1/30/2018	5,487,686	-	2/20/2018	5,542,106	54,421	1%
2018 ACE Plan		51402 2018/2019 Sacrificial Anode Installation	Transmission Plant - T	Complete - Final Costed	1/31/2018	3,023,668	210,000	4/30/2018	3,073,174	49,506	2%
2018 ACE Plan		51860 TRE5 PF Mill Line Replacement	Steam Generation Plant - S	Complete - Final Costed	7/31/2018	258,761	21,442	9/14/2018	264,575	5,814	2%
2018 ACE Plan		51803 TUC2 Generator Flux Probe Installation	Steam Generation Plant - S	Complete - Final Costed	6/21/2018	840,158	-	6/15/2018	863,302	23,144	3%
2018 ACE Plan		50577 TRE6 CEMS Replacement	Steam Generation Plant - S	Complete - Final Costed	8/15/2018	715,562	60,558	10/12/2018	736,211	20,649	3%
2018 ACE Plan		48533 HYD Lequille Headpond Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	10/2/2018	4,472,369	537,354	10/30/2018	4,653,541	181,171	4%
2018 ACE Plan	C0001950	New Distribution Rights-of-Way Ph 3	Distribution Plant - D	Complete - Final Costed	3/30/2018	9,822,493	-	2/1/2018	10,288,858	466,365	5%
2018 ACE Plan		51824 LIN3 ID Fan Damper and VIV Refurbishment	Steam Generation Plant - S	Complete - Final Costed	4/4/2018	443,311	-	4/14/2018	464,603	21,292	5%
2018 ACE Plan		52156 LIN Vaccuum Pump Upgrades	Steam Generation Plant - S	Complete - Final Costed	9/25/2018	302,714	-	4/14/2018	322,107	19,393	6%
2018 ACE Plan		47684 LIN3 - Boiler Refurbishment 2018	Steam Generation Plant - S	Complete - Final Costed	4/4/2018	739,657	-	4/14/2018	791,058	51,401	7%
2018 ACE Plan		43218 88W-323A Tusket Islands Phase 3	Distribution Plant - D	Complete - Final Costed	2/28/2019	654,721	46,671	9/30/2019	703,299	48,578	7%
2018 ACE Plan		49676 TUC2 CEMS Replacement	Steam Generation Plant - S	Complete - Final Costed	7/30/2018	380,140	-	2/26/2019	411,019	30,878	8%
2018 ACE Plan		47871 LIN Stack Re-Coating	Steam Generation Plant - S	Complete - Final Costed	8/31/2018	381,034	62,744	10/22/2021	415,777	34,744	9%
2018 ACE Plan		51835 TUC2 H2 Panel Upgrades	Steam Generation Plant - S	Complete - Final Costed	6/21/2018	454,886	-	6/21/2018	501,488	46,602	10%
2018 ACE Plan		49946 HYD - Fourth Lake Overhaul	Hydro Generation Plant - H	Complete - Final Costed	11/30/2018	1,025,769	81,354	1/30/2019	1,145,995	120,225	12%
2018 ACE Plan		51805 LIN4 Boiler Refurbishment 2018	Steam Generation Plant - S	Complete - Final Costed	4/29/2018	739,657	-	8/1/2018	828,067	88,410	12%
2018 ACE Plan		52253 LIN3 Economizer Header Refurbishment	Steam Generation Plant - S	Complete - Final Costed	3/27/2018	499,951	38,000	5/16/2018	560,687	60,736	12%
2018 ACE Plan	C0001419	TRE HFO Refurbishment Phase 1	Steam Generation Plant - S	Complete - Final Costed	10/15/2018	340,618	28,708	8/15/2019	387,756	47,139	14%
2018 ACE Plan		51802 TRE5 Boiler Refurbishment 2018	Steam Generation Plant - S	Complete - Final Costed	6/15/2018	1,212,228	46,694	9/14/2018	1,384,485	172,257	14%
2018 ACE Plan		52200 65V-301 Brickton Reconductor	Distribution Plant - D	Complete - Final Costed	4/30/2019	594,362	44,264	4/30/2020	678,994	84,632	14%
2018 ACE Plan		52252 LIN1 SH5 Tube Replacement	Steam Generation Plant - S	Complete - Final Costed	10/27/2018	521,259	38,000	10/2/2018	600,706	79,447	15%
2018 ACE Plan		51836 TRE5 Mill Refurbishments 2018	Steam Generation Plant - S	Complete - Final Costed	6/15/2018	409,458	4,394	6/1/2018	479,323	69,865	17%
2018 ACE Plan		49943 HYD - Ruth Falls Facility Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	7/31/2018	1,234,931	143,550	11/19/2019	1,448,446	213,515	17%
2018 ACE Plan		51818 PHB Boiler Refurbishment 2018	Steam Generation Plant - S	Complete - Final Costed	9/30/2018	440,315	38,681	7/31/2018	517,202	76,887	17%
2018 ACE Plan		51806 LIN Mill Refurbishment 2018	Steam Generation Plant - S	Complete - Final Costed	10/21/2018	673,153	-	10/31/2018	791,432	118,279	18%
2018 ACE Plan		51815 LIN CW Pump Refurbishment 2018	Steam Generation Plant - S	Complete - Final Costed	10/21/2018	520,436	-	4/14/2018	613,339	92,902	18%
2018 ACE Plan		52262 HYD - Hells Gate 1 Overhaul	Hydro Generation Plant - H	Complete - Final Costed	11/30/2018	854,993	63,676	5/17/2022	1,011,573	156,579	18%
2018 ACE Plan		48131 48H-T1 Replacement	Transmission Plant - T	Complete - Final Costed	6/30/2019	1,281,449	97,775	11/30/2020	1,517,266	235,817	18%
2018 ACE Plan		51853 LIN3 Turbine Valve Refurb 2018	Steam Generation Plant - S	Complete - Final Costed	4/21/2018	295,709	-	4/14/2018	351,882	56,173	19%
2018 ACE Plan		52224 532N-Elm Street Conversion Phase 2	Distribution Plant - D	Complete - Final Costed	3/30/2019	722,113	56,276	1/31/2019	859,625	137,512	19%
2018 ACE Plan		51852 POT Coal Mill Overhaul 2018	Steam Generation Plant - S	Complete - Final Costed	11/1/2018	327,267	39,997	8/31/2018	392,517	65,250	20%
2018 ACE Plan		51839 LIN Coal Plant Structural Refurbishment	Steam Generation Plant - S	Complete - Final Costed	8/21/2018	354,067	-	9/5/2018	427,548	73,481	21%
2018 ACE Plan		51861 TRE6 CW Screen Replacement 2018	Steam Generation Plant - S	Complete - Final Costed	8/15/2018	513,192	23,439	8/15/2019	621,143	107,951	21%
2018 ACE Plan		51820 TRE5 Reheat Turbine Valves	Steam Generation Plant - S	Complete - Final Costed	6/15/2018	450,408	38,066	9/14/2018	549,705	99,297	22%
2018 ACE Plan		49783 L5027A Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	3/30/2018	648,292	39,383	7/31/2019	791,305	143,013	22%
2018 ACE Plan		52102 L5014-2018 Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	10/31/2018	849,700	56,264	5/31/2018	1,038,850	189,150	22%
2018 ACE Plan		49777 L7002 Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	6/28/2018	926,777	55,579	6/30/2019	1,141,256	214,480	23%
2018 ACE Plan		51849 LIN3 RH Tube Replacement	Steam Generation Plant - S	Complete - Final Costed	4/21/2018	399,546	-	4/14/2018	499,759	100,213	25%
2018 ACE Plan		51811 LIN Reclaim Refurbishment Phase 2	Steam Generation Plant - S	Complete - Final Costed	10/21/2018	534,666	11,500	5/31/2019	671,695	137,029	26%
2018 ACE Plan		52192 54H-303 Underground Device Replacement	Distribution Plant - D	Complete - Final Costed	12/31/2018	309,230	19,273	5/31/2018	388,517	79,287	26%
2018 ACE Plan		51866 HYD - 4th Lake Penstock Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	9/30/2018	696,963	56,683	9/1/2018	902,399	205,436	29%
2018 ACE Plan		51850 LIN4 RH Tube Replacement	Steam Generation Plant - S	Complete - Final Costed	4/21/2018	399,546	-	7/9/2018	522,749	123,203	31%
2018 ACE Plan		52186 4S Feeder Exit Cable Replacement Phase 1	Distribution Plant - D	Complete - Final Costed	12/31/2018	293,509	17,379	12/31/2018	391,593	98,085	33%
2018 ACE Plan	C0001802	54C-211 Queen Street Conversion	Distribution Plant - D	Complete - Final Costed	4/30/2018	705,316	55,296	9/27/2018	953,678	248,363	35%
2018 ACE Plan		51863 2018 Tap Changer Replacements	Transmission Plant - T	Complete - Final Costed	6/30/2018	306,102	14,466	9/30/2018	417,340	111,238	36%
2018 ACE Plan		43429 TRE5 Lube Oil Cooler Retube	Steam Generation Plant - S	Complete - Final Costed	6/15/2018	338,398	29,526	9/15/2021	466,175	127,777	38%
2018 ACE Plan		52119 L5054 2018 Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	11/30/2018	560,143	37,063	7/31/2018	784,720	224,578	40%
2018 ACE Plan		51816 TRE Asbestos Abatement 2018	Steam Generation Plant - S	Complete - Final Costed	10/31/2018	509,035	20,747	9/7/2018	729,996	220,962	43%
2018 ACE Plan		51744 30N-411 Maccan River Rebuild	Distribution Plant - D	Complete - Final Costed	10/31/2018	473,044	33,302	6/30/2019	747,752	274,708	58%
2018 ACE Plan		49898 15N-202 Victoria St Replace Deteriorated Assets	Distribution Plant - D	Complete - Final Costed	8/31/2018	242,253	11,843	8/31/2018	388,998	146,745	61%
2018 ACE Plan		52208 3S Feeder Exit Cable Replacement Phase 2	Distribution Plant - D	Complete - Final Costed	12/31/2018	293,228	19,861	8/31/2018	540,984	247,755	84%
2018 ACE Plan		52239 TUC6 Main and Induction Stop Valve Refurbishment	Steam Generation Plant - S	Complete - Final Costed	7/27/2018	160,053	-	9/14/2018	300,398	140,344	88%
2018 ACE Plan		52204 87W-312G-Tancook Island Replacement	Distribution Plant - D	Complete - Final Costed	6/30/2019	454,096	34,316	12/30/2020	986,488	532,393	117%

						Original Submission Amounts			Actual Amounts			
Filing Type	CI Number		Project Title	Function Class	Status	Estimated In-Service Date	Approved Estimate	Contingency on Approved Estimate	Actual In-Service Date	Actual Spend (as of 09/30/2024)	Variance to Approved Estimate	Variance Percentage
2018 ACE Plan		52018	HYD - RES Revenue Meter Replacement	Hydro Generation Plant - H	Complete - Final Costed	12/31/2018	378,248	29,916	12/23/2021	846,110	467,862	124%
2018 ACE Plan		49944	HYD - Dickie Brook Penstock Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	9/30/2018	478,820	39,405	12/31/2021	1,225,280	746,460	156%
2018 ACE Plan	C0002103		HYD WRC Unit 1 Wicket Gate Thrust Assembly Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	12/30/2018	200,574	-	10/9/2019	906,132	705,557	352%
2018 ACE Plan		52308	2018 RTU Replacement Program	General Plant - P	In-service Complete	1/30/2019	988,056	60,693	1/31/2020	648,734	(339,323)	-34%
2018 ACE Plan		52238	2018/2019 Capacitor Bank Breaker Replacement	Transmission Plant - T	In-service Complete	1/31/2019	433,719	29,049	10/31/2020	300,508	(133,211)	-31%
2018 ACE Plan		51403	2018 PCB Removal Program	Transmission Plant - T	In-service Complete	3/31/2018	4,402,342	316,487	4/30/2018	3,501,178	(901,164)	-20%
2018 ACE Plan		51406	2018/2019 Transmission Switch & Breaker Replacement	Transmission Plant - T	In-service Complete	3/1/2018	1,405,891	94,393	12/31/2018	1,136,173	(269,718)	-19%
2018 ACE Plan		52314	1C-GT1/UT1 Replacement	Transmission Plant - T	In-service Complete	12/31/2019	2,032,393	155,490	11/30/2020	1,677,957	(354,437)	-17%
2018 ACE Plan		52233	2018 Telecom Building Replacement	General Plant - P	In-service Complete	11/30/2018	314,929	21,860	11/30/2018	260,403	(54,526)	-17%
2018 ACE Plan		51400	2018 Sub Recloser Replacements	Distribution Plant - D	In-service Complete	4/30/2018	644,710	49,632	9/30/2019	584,280	(60,430)	-9%
2018 ACE Plan		51235	HYD - WRC Main Access Rd Refurbishment	Hydro Generation Plant - H	In-service Complete	10/30/2018	2,686,075	214,960	12/31/2022	2,675,863	(10,213)	0%
2018 ACE Plan	C0001900		Mount Hope 69-25kV Substation	Transmission Plant - T	In-service Complete	11/30/2019	2,982,338	206,342	11/30/2022	2,996,413	14,076	0%
2018 ACE Plan		51234	HYD - WRC HVAC Upgrade	Hydro Generation Plant - H	In-service Complete	8/31/2019	1,876,537	229,838	1/31/2023	1,893,153	16,616	1%
2018 ACE Plan		51493	2018 PCB Pole Top Transformer Replacement	Distribution Plant - D	In-service Complete	2/23/2018	1,360,354	100,313	6/30/2017	1,384,065	23,711	2%
2018 ACE Plan		52328	56N-T1 Transformer Upgrades	Transmission Plant - T	In-service Complete	3/31/2019	1,279,271	102,094	11/30/2020	1,307,910	28,639	2%
2018 ACE Plan		52305	2018 Substation Insulator Replacement	Transmission Plant - T	In-service Complete	2/1/2018	316,348	19,191	6/30/2018	323,830	7,482	2%
2018 ACE Plan		51398	2018/2019 Steel Tower Refurbishment	Transmission Plant - T	In-service Complete	2/28/2018	1,992,692	146,980	8/31/2018	2,045,977	53,286	3%
2018 ACE Plan		52320	L6549 2018 Replacements & Upgrades	Transmission Plant - T	In-service Complete	10/31/2018	1,406,535	91,115	10/31/2018	1,452,523	45,987	3%
2018 ACE Plan		51797	2018 Oil Containment Program	Transmission Plant - T	In-service Complete	12/31/2018	331,507	23,304	8/31/2019	344,911	13,404	4%
2018 ACE Plan		49788	L5564 Replacements and Upgrades	Transmission Plant - T	In-service Complete	12/31/2018	738,853	47,436	7/31/2019	784,122	45,269	6%
2018 ACE Plan		52059	L5039 - 2018 Replacements and Upgrades	Transmission Plant - T	In-service Complete	5/31/2018	719,825	49,468	6/30/2019	787,965	68,141	9%
2018 ACE Plan		51825	POT Boiler Refurbishment 2018	Steam Generation Plant - S	In-service Complete	4/30/2018	568,740	36,375	5/4/2018	639,401	70,661	12%
2018 ACE Plan		52194	6S-223-Harold Street Conversion	Distribution Plant - D	In-service Complete	8/31/2018	642,368	50,793	7/31/2019	727,382	85,014	13%
2018 ACE Plan		52185	50N-410 Rebuild Phase 2	Distribution Plant - D	In-service Complete	7/31/2018	695,098	52,838	12/31/2018	822,178	127,080	18%
2018 ACE Plan		52205	30N-412 Hwy 242 Fundy Shore Rebuild	Distribution Plant - D	In-service Complete	6/30/2018	536,670	32,766	8/31/2021	777,205	240,535	45%
2018 ACE Plan		52201	55V-314GA-Welsford Reconductor	Distribution Plant - D	In-service Complete	9/30/2018	275,161	21,019	7/31/2020	432,835	157,674	57%
2018 ACE Plan		49779	L6537 Replacements and Upgrades	Transmission Plant - T	In-service Complete	10/14/2018	1,255,220	81,137	10/31/2018	2,284,616	1,029,396	82%
2018 Ace Plan		**49945**	**HYD - Malay Falls Switchgear Replac**	**Hydro Generation Plant - H**	**In-service Complete**	**2/28/2019**	**958,631**	**80,757**	**5/10/2024**	**1,196,364**	**237,733**	**25%**
2019		52292	TUC Heavy Fuel Oil Tank Dyke Refurbishment	Steam Generation Plant - S	Complete - Final Costed	11/28/2019	495,317	18,981	11/28/2019	482,963	(12,354)	-2%
2019	C0011059		IT - Database Infrastructure Segregation	General Plant - P	Complete - Final Costed	4/30/2020	721,816	58,706	2/19/2021	716,130	(5,686)	-1%
2019		49093	IT - Security Operations Center (SOC) and Security Information Event Monitoring (SIEM)	General Plant - P	Complete - Final Costed	1/31/2020	4,074,948	351,781	1/31/2020	4,146,181	71,233	2%
2019	C0021006		IT – Microsoft Exchange Upgrade (Replaces CI 49858)	General Plant - P	Complete - Final Costed	1/31/2020	1,013,478	114,504	6/30/2020	1,073,325	59,847	6%
2019	C0011679		AMO T&D Asset Management Performance Tool	General Plant - P	Complete - Final Costed	12/31/2019	699,974	78,926	6/19/2020	930,933	230,959	33%
2019	C0011380		2019 Telecom Building Replacement	General Plant - P	In-service Complete	5/31/2020	299,657	-	5/31/2021	331,625	31,968	11%
2019	C0010838		MCC - HVAC Replacement	General Plant - P	In-service Complete	7/30/2020	1,105,002	99,439	4/30/2022	1,531,910	426,908	39%
2019 ACE Plan		51790	TRE6 - Generator High Voltage Bushings Replacement	Steam Generation Plant - S	Complete - Final Costed	8/15/2019	694,334	46,883	8/15/2019	392,917	(301,416)	-43%
2019 ACE Plan	C0010325		TRE5 - CW Screen Refurbishment	Steam Generation Plant - S	Complete - Final Costed	10/31/2019	382,776	25,548	10/9/2020	236,964	(145,812)	-38%
2019 ACE Plan	C0012158		HYD - Malay Falls Unit 6 Generator Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	7/30/2019	835,854	96,817	2/24/2020	557,834	(278,020)	-33%
2019 ACE Plan	C0009113		LIN4 - Burner Front Refurbishment	Steam Generation Plant - S	Complete - Final Costed	4/30/2019	373,290	-	7/23/2019	268,475	(104,814)	-28%
2019 ACE Plan	C0009108		LIN4 - Economizer Header Refurbishment	Steam Generation Plant - S	Complete - Final Costed	4/30/2019	509,373	38,000	7/23/2019	415,461	(93,913)	-18%
2019 ACE Plan		50632	TRE - (Bunker C) HFO Refurbishment Project Phase 2	Steam Generation Plant - S	Complete - Final Costed	9/15/2019	2,573,137	187,155	12/15/2019	2,113,228	(459,909)	-18%
2019 ACE Plan	C0010372		TRE5 - Post Cooler Conveyor Refurbishment	Steam Generation Plant - S	Complete - Final Costed	10/15/2019	319,596	18,128	10/31/2019	264,402	(55,195)	-17%
2019 ACE Plan	C0011091		POT - Asbestos Abatement 2019	Steam Generation Plant - S	Complete - Final Costed	5/31/2019	270,498	32,734	1/3/2020	227,075	(43,423)	-16%
2019 ACE Plan	C0010957		HYD - Malay Falls Unit 6 Overhaul	Hydro Generation Plant - H	Complete - Final Costed	7/31/2019	1,273,280	77,376	2/24/2020	1,117,203	(156,077)	-12%
2019 ACE Plan	C0010326		TRE6 - Parallel Slide Valve Replacement	Steam Generation Plant - S	Complete - Final Costed	8/15/2019	256,080	20,261	8/15/2019	227,590	(28,491)	-11%
2019 ACE Plan	C0010369		TRE5 - Baghouse Filter Replacement Phase 2	Steam Generation Plant - S	Complete - Final Costed	11/15/2019	542,340	24,491	11/1/2019	485,730	(56,610)	-10%
2019 ACE Plan	C0003998		HYD - Wreck Cove Station Service Cable Replacement	Hydro Generation Plant - H	Complete - Final Costed	11/30/2019	429,384	44,011	6/28/2021	387,145	(42,239)	-10%
2019 ACE Plan	C0010718		TRE5 - Turbine Main Valve Refurbishment	Steam Generation Plant - S	Complete - Final Costed	10/30/2019	730,005	54,500	9/30/2019	675,642	(54,363)	-7%
2019 ACE Plan		46254	HYD - Mill Lake Surge Tank Replacement	Hydro Generation Plant - H	Complete - Final Costed	10/30/2020	3,598,193	466,975	10/31/2019	3,419,300	(178,894)	-5%
2019 ACE Plan	C0011064		PHB - Boiler Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	8/31/2019	565,707	48,681	11/30/2019	545,270	(20,437)	-4%
2019 ACE Plan		49874	CT - BGT Replace Halon Fire Protection	Gas Turbine Generation Plant - G	Complete - Final Costed	10/31/2019	1,149,153	96,944	5/20/2020	1,116,164	(32,989)	-3%
2019 ACE Plan		47591	TRE5 - Bottom Ash Seal Replacement	Steam Generation Plant - S	Complete - Final Costed	10/31/2019	350,562	29,272	10/31/2019	344,136	(6,425)	-2%
2019 ACE Plan	C0009088		LIN - 1&2 CEMS Replacement	Steam Generation Plant - S	Complete - Final Costed	9/1/2019	757,499	65,359	10/17/2019	760,179	2,680	0%
2019 ACE Plan	C0010141		POT - IP-LP Turbine Refurbishment	Steam Generation Plant - S	Complete - Final Costed	7/31/2019	2,938,990	245,840	6/28/2019	2,956,698	17,708	1%
2019 ACE Plan	C0010040		New Distribution Rights-of-Way Widening Phase 4	Distribution Plant - D	Complete - Final Costed	1/1/2019	10,275,861	-	11/30/2018	10,356,561	80,700	1%
2019 ACE Plan	C0004058		HYD - Tidewater 2 Overhaul	Hydro Generation Plant - H	Complete - Final Costed	8/31/2019	1,916,321	217,535	2/28/2020	1,959,940	43,619	2%
2019 ACE Plan		48536	HYD - Wreck Cove Brook Dam D-9 Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	9/30/2019	597,697	67,330	8/22/2019	618,980	21,283	4%
2019 ACE Plan	C0007638		POT - Generator Auxiliary Equipment Refurbishment	Steam Generation Plant - S	Complete - Final Costed	7/31/2019	3,473,920	288,627	6/28/2019	3,601,411	127,491	4%
2019 ACE Plan	C0010498		POT - Turbine Valve Refurbishment	Steam Generation Plant - S	Complete - Final Costed	7/5/2019	698,497	59,090	6/28/2019	724,495	25,998	4%
2019 ACE Plan	C0011076		POT - Boiler Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	5/30/2019	1,388,434	115,014	6/21/2019	1,442,731	54,297	4%
2019 ACE Plan	C0011188		23H-303 - Willett Street Underground Replacement	Distribution Plant - D	Complete - Final Costed	12/31/2019	286,624	18,466	7/31/2021	298,767	12,143	4%
2019 ACE Plan	C0009079		LIN - CW Pump Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	7/1/2019	522,011	-	4/24/2019	544,550	22,540	4%
2019 ACE Plan	C0011338		L5548- Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	1/1/2019	1,699,381	128,983	4/30/2019	1,796,576	97,195	6%
2019 ACE Plan	C0010142		POT - HP Turbine refurbishment	Steam Generation Plant - S	Complete - Final Costed	7/31/2019	1,813,421	152,665	6/28/2019	1,942,027	128,607	7%
2019 ACE Plan	C0009100		LIN4 - Boiler Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	4/30/2019	754,772	-	7/23/2019	811,487	56,716	8%
2019 ACE Plan	C0010950		2019/2020 Steel Tower Refurbishment	Transmission Plant - T	Complete - Final Costed	9/1/2019	2,009,268	152,560	12/31/2019	2,168,601	159,333	8%
2019 ACE Plan		51238	TRE - Asbestos Abatement 2019	Steam Generation Plant - S	Complete - Final Costed	11/15/2019	1,030,841	81,795	12/15/2019	1,113,337	82,496	8%
2019 ACE Plan	C0009082		LIN - Reclaim Feeder Refurbishment Phase 3	Steam Generation Plant - S	Complete - Final Costed	8/1/2019	542,948	11,500	10/17/2019	586,460	43,512	8%
2019 ACE Plan		49714	TUC - UT3 and ST34 Cable Replacement	Steam Generation Plant - S	Complete - Final Costed	9/13/2019	606,863	52,293	3/31/2021	659,512	52,649	9%
2019 ACE Plan	C0010318		TRE6 - Boiler Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	8/15/2019	1,016,388	43,291	8/15/2019	1,114,668	98,279	10%
2019 ACE Plan	C0009099		LIN3 - Boiler Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	6/10/2019	788,176	-	5/31/2019	865,166	76,990	10%
2019 ACE Plan	C0009080		LIN - CW Screen Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	7/1/2019	354,651	-	5/31/2019	395,892	41,240	12%
2019 ACE Plan	C0011242		L5541 -Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	1/1/2019	1,624,850	124,588	6/30/2020	1,822,761	197,911	12%
2019 ACE Plan	C0010323		TRE6 - Mills Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	8/15/2019	796,370	43,504	8/15/2019	894,077	97,707	12%
2019 ACE Plan		49991	TUC1 - CEMS Installation	Steam Generation Plant - S	Complete - Final Costed	11/19/2019	404,343	33,253	12/31/2019	454,204	49,861	12%
2019 ACE Plan	C0011200		6S-224 - Birch Hill Drive Conversion	Distribution Plant - D	Complete - Final Costed	4/30/2019	542,026	42,186	11/30/2020	615,811	73,785	14%
2019 ACE Plan	C0011320		22W-311GA - Hawk Point Road Reconductor Replacement	Distribution Plant - D	Complete - Final Costed	8/31/2019	465,758	35,473	3/30/2020	542,223	76,465	16%
2019 ACE Plan	C0011300		L7005 -Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	1/1/2019	1,346,026	103,826	10/31/2019	1,571,512	225,486	17%
2019 ACE Plan	C0009092		LIN3 - Reheat Tube Replacement 2019	Steam Generation Plant - S	Complete - Final Costed	4/1/2019	412,548	-	5/31/2019	482,716	70,168	17%
2019 ACE Plan	C0011209		85S-401 Cabot Trail Rebuild	Distribution Plant - D	Complete - Final Costed	5/31/2019	1,305,919	101,095	11/30/2019	1,539,808	233,889	18%
2019 ACE Plan	C0011240		L5511 - Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	1/1/2019	1,255,087	94,732	2/28/2019	1,485,116	230,029	18%
2019 ACE Plan	C0010319		TRE5 - Boiler Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	11/15/2019	518,302	22,347	9/26/2019	613,921	95,619	18%
2019 ACE Plan		49656	TUC - Waste Water Treatment Plant Controls Upgrade	Steam Generation Plant - S	Complete - Final Costed	10/29/2019	305,851	19,987	11/28/2019	366,139	60,288	20%
2019 ACE Plan	C0009093		LIN4 - Reheat Tube Replacement 2019	Steam Generation Plant - S	Complete - Final Costed	4/30/2019	412,548	-	7/23/2019	497,095	84,546	20%
2019 ACE Plan	C0011309		54H-304 - Underground Device Replacement	Distribution Plant - D	Complete - Final Costed	12/31/2019	685,268	43,961	1/31/2021	827,472	142,204	21%
2019 ACE Plan	C0007398		POT - Air Heater Refurbishment	Steam Generation Plant - S	Complete - Final Costed	5/30/2019	669,205	55,206	5/31/2019	817,083	147,878	22%
2019 ACE Plan	C0011088		POT - Coal Mill Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	11/30/2019	472,973	56,006	11/30/2019	579,947	106,974	23%
2019 ACE Plan	C0009059		LIN - Coal Plant Structural Refurbishment Phase 5	Steam Generation Plant - S	Complete - Final Costed	9/1/2019	375,902	-	5/31/2019	470,748	94,846	25%
2019 ACE Plan	C0009096		LIN - Mill Refurbishment 2019	Steam Generation Plant - S	Complete - Final Costed	7/1/2019	677,819	-	4/24/2019	873,091	195,272	29%
2019 ACE Plan	C0011085		POT - Hydrogen Panel Replacement	Steam Generation Plant - S	Complete - Final Costed	7/31/2019	464,252	39,933	6/23/2019	698,908	234,656	51%
2019 ACE Plan	C0006859		HYD - Wreck Cove Crane Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	6/30/2019	498,167	59,191	2/15/2020	906,276	408,109	82%
2019 ACE Plan	C0017920		PTMT – Shuttle Belt Replacement	Steam Generation Plant - S	Complete - Final Costed	8/30/2019	197,219	17,000	12/31/2021	661,037	463,818	235%
2019 ACE Plan	C0009111		LIN4 - Bottom Ash Refurbishment	Steam Generation Plant - S	In-service Complete	4/30/2019	448,240	-	7/23/2019	291,059	(157,180)	-35%
2019 ACE Plan	C0009094		LIN Fly Ash Precipitator Component Refurbishment	Steam Generation Plant - S	In-service Complete	7/1/2019	414,046	-	5/31/2019	325,993	(88,053)	-21%
2019 ACE Plan	C0011918		2019 Oil Containment Program	Transmission Plant - T	In-service Complete	10/31/2019	468,041	34,912	12/15/2020	385,166	(82,874)	-18%
2019 ACE Plan	C0011197		64N Lourdes Street Conversion Phase 1	Distribution Plant - D	In-service Complete	2/28/2020	576,031	45,579	8/31/2020	497,136	(78,895)	-14%
2019 ACE Plan	C0010949		2019/2020 Steel Tower Life Extension	Transmission Plant - T	In-service Complete	6/1/2019	2,414,140	179,886	8/30/2019	2,178,231	(235,909)	-10%
2019 ACE Plan	C0004165		70W-311G - Crousetown Road Phase Extension	Distribution Plant - D	In-service Complete	6/30/2019	285,117	22,004	4/30/2021	259,633	(25,484)	-9%
2019 ACE Plan	C0011241		L5026 -Replacements and Upgrades	Transmission Plant - T	In-service Complete	1/1/2019	1,498,789	113,286	1/31/2019	1,379,563	(119,226)	-8%
2019 ACE Plan	C0010952		2019/2020 Substation Polychlorinated Biphenyl (PCB) Equipment Removal	Transmission Plant - T	In-service Complete	12/31/2019	2,786,245	204,962	5/31/2019	2,648,668	(137,577)	-5%
2019 ACE Plan	C0011458		ICP - Rail System Refurbishment Program 2019	Steam Generation Plant - S	In-service Complete	8/15/2019	620,192	50,144	11/22/2019	593,193	(26,998)	-4%
2019 ACE Plan		48638	TRE - Rail Car Fuel Delivery Upgrade	Steam Generation Plant - S	In-service Complete	10/31/2019	1,236,623	95,081	3/20/2020	1,209,148	(27,475)	-2%

					Original Submission Amounts			Actual Amounts				
Filing Type	CI Number	Project Title	Function Class	Status	Estimated In-Service Date	Approved Estimate	Contingency on Approved Estimate	Actual In-Service Date	Actual Spend (as of 09/30/2024)	Variance to Approved Estimate	Variance Percentage
2019 ACE Plan	C0010978	2019/2020 Transmission Switch & Breaker Replacement	Transmission Plant - T	In-service Complete	4/1/2019	1,044,148	73,241	5/31/2019	1,029,370	(14,778)	-1%
2019 ACE Plan	C0010042	2019 Transmission Right-of-Way Widening 69kV	Transmission Plant - T	In-service Complete	1/1/2019	5,650,794	-	1/1/2019	5,630,060	(20,733)	0%
2019 ACE Plan	C0011206	102W-311 - Jedediah Rd Rebuild	Distribution Plant - D	In-service Complete	11/30/2019	317,453	24,289	7/31/2022	327,667	10,215	3%
2019 ACE Plan	C0011208	2019 Padmount Replacement Program	Distribution Plant - D	In-service Complete	2/1/2019	1,413,544	115,580	2/28/2019	1,463,210	49,667	4%
2019 ACE Plan	C0010948	2019/2020 Sacrificial Anode Installation Program	Transmission Plant - T	In-service Complete	1/1/2019	3,099,862	235,011	12/31/2019	3,244,208	144,346	5%
2019 ACE Plan	C0011243	L5551 - Replacements and Upgrades	Transmission Plant - T	In-service Complete	1/1/2019	1,014,077	77,482	12/31/2018	1,115,403	101,325	10%
2019 ACE Plan	C0008559	POT Diesel Generator and Essential Services Switchgear Replacement	Steam Generation Plant - S	In-service Complete	10/30/2019	294,571	10,047	12/31/2021	324,955	30,384	10%
2019 ACE Plan	C0008098	TRE - Sludge Dewatering Infrastructure	Steam Generation Plant - S	In-service Complete	7/31/2019	663,486	53,282	9/15/2022	772,033	108,547	16%
2019 ACE Plan	C0011339	L6549 - Replacements and Upgrades Phase 2	Transmission Plant - T	In-service Complete	1/1/2019	2,209,907	168,543	8/1/2019	2,576,955	367,047	17%
2019 ACE Plan	C0011851	2019 Tap Changer Replacements/Refurbishments	Transmission Plant - T	In-service Complete	8/31/2019	326,937	21,010	7/31/2019	446,725	119,789	37%
2019 ACE Plan	C0011182	15N-202 - Dominion St and Arthur St Rebuild	Distribution Plant - D	In-service Complete	6/30/2019	328,292	22,626	8/31/2021	454,814	126,522	39%
2019 ACE Plan	**C0002539**	**HYD Bridge Replacements**	**Hydro Generation Plant - H**	**In-service Complete**	**11/30/2020**	**6,843,686**	**1,007,718**	**1/15/2020**	**6,201,805**	**(641,881)**	**-9%**
2019 ACE Plan	**C0006319**	**D-2019 PCB Pole Top Transformer Rep**	**Distribution Plant - D**	**In-service Complete**	**1/30/2019**	**1,177,592**	**87,640**	**1/31/2019**	**1,282,046**	**104,454**	**9%**
2020	C0010019	IT – ADMS Upgrade	General Plant - P	Complete - Final Costed	10/31/2020	9,626,891	393,274	4/30/2021	10,032,234	405,343	4%
2020	C0021805	IT - Microsoft Enterprise Agreement 2020	General Plant - P	Complete - Final Costed	7/31/2020	3,139,727	-	10/31/2020	3,307,541	167,814	5%
2020	49859	IT Windows Server 2008 Upgrade	General Plant - P	Complete - Final Costed	12/31/2019	1,183,310	90,575	12/31/2019	1,276,967	93,657	8%
2020	C0021826	IT Enterprise Data Lake	General Plant - P	Complete - Final Costed	2/28/2021	1,260,417	146,847	5/20/2021	1,475,738	215,321	17%
2020	C0019379	50N-410 – 4C-430 Highway 104 Twinning	Distribution Plant - D	In-service Complete	12/31/2020	1,137,223	86,239	11/30/2022	1,228,682	91,459	8%
2020	**C0020385**	**LIN Heavy Oil Tank Refurbishment**	**Steam Generation Plant - S**	**In-service Complete**	**10/30/2020**	**3,396,731**	**482,395**	**8/31/2023**	**2,805,664**	**(591,067)**	**-17%**
2020	**C0023623**	**AMO Distribution APM Program**	**General Plant - P**	**In-service Complete**	**8/31/2021**	**1,721,484**	**126,200**	**9/30/2022**	**1,818,109**	**96,625**	**6%**
2020	**C0023622**	**AMO Substation and Trans APM Progra**	**General Plant - P**	**In-service Complete**	**8/31/2021**	**2,217,589**	**156,953**	**8/31/2022**	**2,365,541**	**147,952**	**7%**
2020 ACE Plan	C0021104	L5550 Replacements and Upgrades Phase 1	Transmission Plant - T	Complete - Final Costed	3/1/2020	2,234,816	171,680	2/28/2021	1,927,663	(307,154)	-14%
2020 ACE Plan	C0006358	HYD - Lake Mulgrave Dam Refurbishments	Hydro Generation Plant - H	Complete - Final Costed	11/30/2020	5,853,650	613,185	11/30/2020	5,878,590	24,940	0%
2020 ACE Plan	C0012878	HYD - Weymouth Falls Unit 1 Generator Refurbishment	Hydro Generation Plant - H	Complete - Final Costed	9/30/2020	2,264,326	184,388	12/15/2021	2,378,083	113,757	5%
2020 ACE Plan	52285	L5524 Replacements and Upgrades	Transmission Plant - T	Complete - Final Costed	1/1/2020	2,161,314	165,309	1/31/2020	2,274,545	113,231	5%
2020 ACE Plan	C0021584	TUC3 Turbine Valves Refurbishments	Steam Generation Plant - S	Complete - Final Costed	10/31/2020	1,041,020	76,619	12/15/2021	1,113,051	72,030	7%
2020 ACE Plan	C0021130	48H Metalclad Switchgear Replacement	Transmission Plant - T	Complete - Final Costed	9/30/2020	1,210,706	79,076	11/30/2020	1,391,009	180,304	15%
2020 ACE Plan	49949	LM6000 TUC4 Control System Replacement	Gas Turbine Generation Plant - G	In-service Complete	6/30/2020	1,149,996	181,947	7/22/2021	901,766	(248,230)	-22%
2020 ACE Plan	C0021182	93V-313-Meteghan Rebuild	Distribution Plant - D	In-service Complete	12/31/2021	1,075,625	81,319	5/31/2021	927,232	(148,393)	-14%
2020 ACE Plan	C0021106	L7005 Replacements and Upgrades Phase 1	Transmission Plant - T	In-service Complete	7/1/2020	3,576,991	277,387	6/30/2021	3,134,264	(442,727)	-12%
2020 ACE Plan	C0021323	Trenton 50N-T13 Replacement	Transmission Plant - T	In-service Complete	9/30/2021	1,516,880	118,482	10/31/2021	1,336,009	(180,871)	-12%
2020 ACE Plan	C0021026	Willow Lane 15N-T3 Replacement	Transmission Plant - T	In-service Complete	8/31/2021	1,326,647	103,018	10/31/2021	1,171,158	(155,488)	-12%
2020 ACE Plan	C0020835	2020 Padmount Replacement Program	Distribution Plant - D	In-service Complete	3/1/2020	1,612,389	129,526	3/31/2020	1,514,842	(97,547)	-6%
2020 ACE Plan	C0021142	19W-T51 Transformer Replacement	Transmission Plant - T	In-service Complete	9/30/2021	1,512,336	112,125	10/31/2021	1,473,327	(39,010)	-3%
2020 ACE Plan	C0020623	New Distribution Rights-of-Way Phase 5	Distribution Plant - D	In-service Complete	2/1/2020	10,015,266	-	2/29/2020	9,930,358	(84,908)	-1%
2020 ACE Plan	52303	L7019 Replacements and Upgrades	Transmission Plant - T	In-service Complete	6/1/2020	1,374,092	107,112	4/30/2021	1,383,196	9,104	1%
2020 ACE Plan	C0020627	2020 Transmission Right-of-Way Widening 69kV	Transmission Plant - T	In-service Complete	1/1/2020	5,489,820	-	1/31/2020	5,615,379	125,559	2%
2020 ACE Plan	C0021107	L8001 Replacements and Upgrades Phase 1	Transmission Plant - T	In-service Complete	6/1/2020	2,292,093	174,528	10/31/2021	2,517,260	225,167	10%
2020 ACE Plan	C0021122	2020/2021 Transmission Switch & Breaker Replacement	Transmission Plant - T	In-service Complete	2/1/2020	1,312,643	49,055	7/31/2020	1,501,173	188,530	14%
2020 ACE Plan	**C0010955**	**2020/2021 Wood Pole Retreatment**	**Transmission Plant - T**	**Complete - Final Costed**	**5/30/2020**	**1,410,561**	**104,521**	**7/31/2020**	**912,015**	**(498,546)**	**-35%**
2020 ACE Plan	**C0021123**	**2020/2021 Substation PCB Equipment**	**Transmission Plant - T**	**In-service Complete**	**1/30/2020**	**5,197,372**	**205,771**	**4/30/2020**	**5,348,086**	**150,714**	**3%**
2020 ACE Plan	**C0020834**	**2020-21 Inaccessible PCB Transf Rep**	**Distribution Plant - D**	**In-service Complete**	**6/30/2020**	**2,950,294**	**212,057**	**5/31/2021**	**3,095,184**	**144,890**	**5%**
2021	**C0021839**	**IT-Customer Energy Management**	**General Plant - P**	**Complete - Final Costed**	**10/31/2021**	**6,672,521**	**611,106**	**10/14/2021**	**6,649,484**	**(23,037)**	**0%**
2021	**46075**	**IT - Work and Asset Management**	**General Plant - P**	**In-service Complete**	**3/30/2023**	**60,904,140**	**10,740,772**	**4/1/2023**	**56,733,723**	**(4,170,417)**	**-7%**
2021	**47794**	**Heckman Island Underwater Cable Rep**	**Distribution Plant - D**	**In-service Complete**	**11/30/2021**	**1,338,364**	**149,273**	**3/31/2024**	**1,522,969**	**184,605**	**14%**
2021 ACE Plan	C0020944	LM6000 - 191-443 Hot Section Engine Refurbishment	Gas Turbine Generation Plant - G	Complete - Final Costed	5/30/2022	5,749,282	1,257,375	12/22/2021	4,542,874	(1,206,408)	-21%
2021 ACE Plan	49094	IT - Privilege Access Management (PAM)	General Plant - P	Complete - Final Costed	6/30/2021	3,211,166	250,329	12/16/2022	3,134,756	(76,410)	-2%
2021 ACE Plan	C0030528	TUC3 HP Turbine Refurbishment	Steam Generation Plant - S	Complete - Final Costed	12/15/2021	2,085,094	83,763	12/15/2021	2,137,023	51,929	2%
2021 ACE Plan	C0031145	2021 Padmount Replacement Program	Distribution Plant - D	In-service Complete	2/1/2021	1,636,153	131,745	3/31/2021	1,214,224	(421,929)	-26%
2021 ACE Plan	C0031089	2021/2022 Transmission Right-of-Way Widening 69kV	Transmission Plant - T	In-service Complete	4/1/2021	5,288,520	-	7/31/2021	5,505,236	216,716	4%
2021 ACE Plan	C0031083	New Distribution Rights-of-Way Phase 6	Distribution Plant - D	In-service Complete	5/1/2021	9,762,735	-	7/31/2021	10,228,807	466,073	5%
2021 ACE Plan	**C0031069**	**L6020 Replacements and Upgrades**	**Transmission Plant - T**	**Complete - Final Costed**	**1/30/2021**	**1,825,300**	**144,084**	**7/31/2021**	**1,520,929**	**(304,371)**	**-17%**
2021 ACE Plan	**C0031064**	**L5054 Line Replacements and Upgrade**	**Transmission Plant - T**	**In-service Complete**	**1/30/2021**	**1,134,737**	**89,373**	**1/31/2022**	**1,002,725**	**(132,012)**	**-12%**
2021 ACE Plan	**C0031263**	**2021/2022 Substation Polychlorinate**	**Transmission Plant - T**	**In-service Complete**	**3/30/2021**	**7,512,226**	**523,576**	**3/31/2021**	**6,900,350**	**(611,876)**	**-8%**
2021 ACE Plan	**C0031085**	**L6516 Line Replacement and Upgrades**	**Transmission Plant - T**	**In-service Complete**	**1/30/2021**	**2,730,592**	**216,832**	**6/30/2022**	**2,533,174**	**(197,418)**	**-7%**
2021 ACE Plan	**C0031262**	**2021-22 Transmission Switch & Break**	**Transmission Plant - T**	**In-service Complete**	**3/30/2021**	**1,483,048**	**111,305**	**3/31/2021**	**1,464,606**	**(18,442)**	**-1%**
2021 ACE Plan	**C0031050**	**New Spare Large Autotransformer**	**Transmission Plant - T**	**In-service Complete**	**9/30/2022**	**2,398,564**	**203,954**	**10/31/2023**	**2,373,033**	**(25,531)**	**-1%**
2021 ACE Plan	**C0033645**	**2021-2022 Steel Tower Refurbishment**	**Transmission Plant - T**	**In-service Complete**	**1/30/2021**	**1,944,005**	**152,560**	**4/30/2021**	**2,170,711**	**226,706**	**12%**
2022	C0005498	IT – Endpoint Security	General Plant - P	Complete - Final Costed	6/30/2023	1,580,572	179,445	6/30/2023	1,597,245	16,673	1%
2022	C0049212	L8001 Replacements and Upgrades Phase 3	Transmission Plant - T	In-service Complete	5/30/2022	1,263,906	143,252	5/31/2023	1,210,624	(53,282)	-4%
2022	49634	HYD - Trout River Diversion Structure Replacement	Hydro Generation Plant - H	In-service Complete	9/30/2023	2,509,894	371,380	10/31/2023	2,604,430	94,536	4%
2022	**C0041807**	**L5534 Replacements and Upgrades**	**Transmission Plant - T**	**In-service Complete**	**3/31/2023**	**1,426,418**	**161,842**	**2/29/2024**	**1,467,520**	**41,102**	**3%**
2022 ACE Plan	C0029693	CT - VJ1 Generator Replacement	Gas Turbine Generation Plant - G	In-service Complete	6/30/2022	5,942,640	862,313	6/17/2022	4,060,126	(1,882,514)	-32%
2022 ACE Plan	C0041789	L5550 Replacements and Upgrades Phase 2	Transmission Plant - T	In-service Complete	1/1/2022	2,698,515	306,296	6/30/2022	1,987,590	(710,925)	-26%
2022 ACE Plan	C0041810	L5022 Replacements and Upgrades	Transmission Plant - T	In-service Complete	1/1/2022	2,172,200	244,494	6/30/2022	1,618,315	(553,885)	-25%
2022 ACE Plan	C0041790	L8001 Replacements and Upgrades Phase 2	Transmission Plant - T	In-service Complete	5/30/2022	1,395,537	156,873	6/30/2022	1,170,047	(225,490)	-16%
2022 ACE Plan	C0041906	PHB – 2022 Turbine Refurbishment	Steam Generation Plant - S	In-service Complete	11/30/2022	3,729,597	452,851	12/14/2022	3,486,965	(242,632)	-7%
2022 ACE Plan	C0038747	LIN1 L-0 Blade Replacement	Steam Generation Plant - S	In-service Complete	6/30/2023	6,066,800	662,997	4/30/2023	5,676,415	(390,385)	-6%
2022 ACE Plan	C0041793	L7002 Replacements and Upgrades Phase 2	Transmission Plant - T	In-service Complete	4/1/2022	3,640,960	417,551	5/31/2023	3,501,570	(139,390)	-4%
2022 ACE Plan	C0030529	TUC3 Generator Refurbishment	Steam Generation Plant - S	In-service Complete	5/15/2022	1,629,926	93,813	8/30/2022	1,590,844	(39,081)	-2%
2022 ACE Plan	C0029691	CT - VJ1 Control System Upgrade	Gas Turbine Generation Plant - G	In-service Complete	6/30/2022	1,016,225	43,895	6/17/2022	1,002,081	(14,144)	-1%
2022 ACE Plan	**C0041800**	**L5537 Replacements and Upgrades**	**Transmission Plant - T**	**Complete - Final Costed**	**1/30/2022**	**1,270,698**	**144,294**	**1/31/2022**	**648,216**	**(622,482)**	**-49%**
2022 ACE Plan	**C0041796**	**L6020 Replacements and Upgrades Ph2**	**Transmission Plant - T**	**Complete - Final Costed**	**5/30/2022**	**2,518,243**	**285,770**	**8/31/2022**	**3,281,196**	**762,953**	**30%**
2022 ACE Plan	**C0041805**	**L7005 Replacements and Upgrades Ph2**	**Transmission Plant - T**	**In-service Complete**	**5/30/2022**	**3,182,518**	**363,741**	**9/30/2022**	**2,909,294**	**(273,224)**	**-9%**
2022 ACE Plan	**C0041989**	**2022 2023 Sacrificial Anode Inst Pr**	**Transmission Plant - T**	**In-service Complete**	**7/30/2022**	**3,015,107**	**235,110**	**10/31/2022**	**2,773,423**	**(241,684)**	**-8%**
2022 ACE Plan	**C0043130**	**2022 Padmount Replacement Program**	**Distribution Plant - D**	**In-service Complete**	**3/30/2022**	**1,807,359**	**143,426**	**5/31/2022**	**1,716,290**	**(91,069)**	**-5%**
2022 ACE Plan	**C0041893**	**2022/2023 Trans ROW Widening 69kV**	**Transmission Plant - T**	**In-service Complete**	**6/30/2022**	**5,312,315**	**-**	**8/31/2022**	**5,185,197**	**(127,118)**	**-2%**
2022 ACE Plan	**C0041892**	**New Distribution ROW Phase 7**	**Distribution Plant - D**	**In-service Complete**	**8/30/2022**	**9,854,291**	**-**	**7/31/2022**	**9,951,865**	**97,574**	**1%**
2023	C0047294	IT - Microsoft Enterprise Agreement Renewal	General Plant - P	Complete - Final Costed	7/30/2023	2,104,569	-	7/1/2023	1,828,822	(275,747)	-13%
2023	**C0043910**	**IT-Customer Energy MangementPhase2**	**General Plant - P**	**Complete - Final Costed**	**10/31/2023**	**1,683,098**	**147,856**	**10/31/2023**	**1,656,245**	**(26,853)**	**-2%**
2023	C0041651	TUC HFO Tank 4 Refurbishment	Steam Generation Plant - S	In-service Complete	12/30/2022	2,734,313	-	12/21/2022	2,678,392	(55,921)	-2%
2023	**C0031052**	**Replenish Spare used at 58C**	**Transmission Plant - T**	**In-service Complete**	**6/30/2023**	**1,303,827**	**114,518**	**8/31/2023**	**1,070,167**	**(233,660)**	**-18%**
2023	**C0030984**	**IT- Cisco UCS Lifecycle**	**General Plant - P**	**In-service Complete**	**2/28/2024**	**2,456,609**	**299,713**	**2/14/2024**	**2,088,998**	**(367,611)**	**-15%**
2023	**C0059403**	**62H Low Voltage Switchgear Replacem**	**Transmission Plant - T**	**In-service Complete**	**1/31/2024**	**1,485,176**	**148,031**	**4/30/2024**	**1,362,578**	**(122,598)**	**-8%**
2023	**C0011167**	**IT-Backup Infrastructure Upgrade**	**General Plant - P**	**In-service Complete**	**12/31/2023**	**2,315,457**	**174,019**	**2/1/2024**	**2,295,818**	**(19,639)**	**-1%**
2023 ACE Plan	**C0041506**	**CT LM6000 Engine 191-253 Refurbishm**	**Gas Turbine Generation Plant - G**	**Complete - Final Costed**	**5/30/2023**	**8,740,979**	**1,988,271**	**3/29/2024**	**13,022,781**	**4,281,802**	**49%**
2023 ACE Plan	**C0051135**	**TUC2 - Turbine Valves Refurb 2023**	**Steam Generation Plant - S**	**In-service Complete**	**12/30/2023**	**1,048,924**	**124,559**	**12/31/2023**	**967,772**	**(81,152)**	**-8%**
2023 ACE Plan	**C0050836**	**2023 Padmount Replacement Program**	**Distribution Plant - D**	**In-service Complete**	**5/30/2023**	**1,309,551**	**102,555**	**6/30/2023**	**1,242,092**	**(67,459)**	**-5%**
2023 ACE Plan	**C0051134**	**TUC2 L-0 Blade Replacement**	**Steam Generation Plant - S**	**In-service Complete**	**12/30/2023**	**4,157,503**	**354,169**	**12/31/2023**	**4,168,405**	**10,902**	**0%**
2024	**C0051894**	**TUC - HFO Tank No.3 Refurbishment**	**Steam Generation Plant - S**	**In-service Complete**	**1/30/2024**	**2,218,012**	**-**	**1/31/2024**	**2,252,224**	**34,212**	**2%**
2024	**C0053655**	**HYD - COW 11 Overhaul**	**Hydro Generation Plant - H**	**In-service Complete**	**5/30/2024**	**1,225,491**	**-**	**5/29/2024**	**1,284,106**	**58,615**	**5%**
2024 ACE Plan	**C0041050**	**LIN 824 Wheeled Dozer Replacement**	**Steam Generation Plant - S**	**In-service Complete**	**1/30/2024**	**1,607,862**	**76,565**	**4/30/2024**	**1,530,935**	**(76,927)**	**-5%**
							53,133,549		**685,591,227**	**22,968,305**	

Note: In accordance with the Board's direction in the 2023 ACE Plan Decision, CI C0021102 - L0529 Replacements and Upgrades has been removed from the data above. This project was originally approved in the 2020 ACE Plan at $6.21M, and was underspent by $5.93M, for a total final cost of $0.28M.

Project Title	Comments/Notes	Variance Explanation Less Than 25% Varaince
L7003 Lidar Upgrades		
TUC2 North Boiler Feedwater Pump Refurbishment	Subsequently approved >$250 in 2017 for $274,951. NSUARB letter dated November 8, 2019 advised NSUARB approval of ATO not required due to PUA changes.	
HYD - SHH Controls Upgrade		
LIN4 Turbine Vibration Monitoring Upgrade	Subsequently approved >$250 in 2017 for $280,095.	
36V-303 Reconductor Middle Dyke Rd	Subsequently approved >$250 in 2017 for $287,779.	
TUC6 Condenser Waterbox Coating Replacement	Subsequently approved >$250 in 2017 for $366,978.	
TRE5 Sootblower Controls Upgrade	Subsequently approved >$250 in 2017 for $285,301.	
LIN Ash Scale Replacement	Subsequently approved >$250 in 2017 for $481,252.	
East Switch Upgrades 15S	Subsequently approved >$250 in 2017 for $304,379.	
TRE Asbestos Abatement (2016)	Subsequently approved >$250 in 2017 for $2,096,391.	
PHB - Boiler Refurbishment 2017		Due to less scope of boiler work required than was originally estimated. Contingency was not required.
LIN A Gallery Floor Replacement		Due to contractor costs being less than initially estimated. Contingency was not required.
HYD - Lequille Pipeline Replacement		
HYD Harmony Stabilization		
TUC#5 LM6000 Generator Stator Re-wedge		
BGT2 Engine Refurbishment		
HYD Lequille Controls Upgrades		
HYD - Hells Gate 2 Overhaul	FIN approved October 26, 2018.	
HYD Lequille Switchgear Replacement		
TRE6 Generator High Voltage Bushings Critical Spare		
Stator Rewind Kit Capital Spare		
HYD - Gulch Penstock & Surge Tank Replacement		
IT - Storage Infrastructure Upgrade		
Replace Mobile Radio System		
TRE6 LP Turbine Diaphragm Tip Seal Replacement	FIN approved June 12, 2018.	
HYD Bridge Remediation		
TRE6 Turbine Valve Refurbishment		
IT - Sharepoint Upgrade		
VOIP Expansion		
IT - CIS High Availability		
TRE6 Generator Rotor Flux Probe Installation		
Intelligent Feeder Project		
8SS-402 Re-Insulate		
129H Kearney Lake Load Transfer		
TRE6 HIP Turbine Diaphragm Partition Refurbishment		
TUC3 IP Turbine Refurbishment	ATO approved October 9, 2018.	
2017 Substation Recloser Replacements		
Electric Vehicle Infrastructure Deployment	2017 submission was not approved by NSUARB.	
HYD - Gisborne Switchgear Replacmnt		
POT Air Heater Refurbishment		
Tiverton Tower Replacement	ATO approved May 23, 2019.	
TUC2 Boiler Selective Waterwall Tube Replacements		
Tap Changer Replacements		
HYD - Lequille Overhaul	ATO approved April 10, 2018.	
Western Switching Upgrades	ATO approved June 11, 2019.	
6P Mobile Substation Rewind		**Pricing for the rewind came in substantially lower than originally budgeted.**
IT - Desktop SW Modernization		
Customer Experience Self-Serve Development Phase 2		
2H Armdale New Feeders	ATO approved June 19, 2020.	
3S Gannon Road – Bus Reconfiguration	ATO approved June 6, 2018.	
2017 / 2018 Capacitor Bank Breaker Replacements		Due to labour costs being less than initially estimated. Contingency was not required.
2017 Substation Insulator Replacement Program		Replacements focused on lower voltage classes which reduced material and labour costs. Contingency was not required.
L7004 Replacements and Upgrades		Due to labour and contract costs being less than initially estimated. Contingency was not required.
2017 Oil Containment Program		
HYD Scragg Lake Dam and Spillway Refurbishment	FIN approved December 6, 2018.	
L7008 Replacements and Upgrades		
Mersey River Hydro Spare Transformer		
LIN Vacuum Pump Cooler Refurbishment		
509V-301 Overcove Rd Replacements		
532N Elm Street Conversion Phase 1		
11S-302 11S-401 Rebuild Coxheath Phase 2		
LIN CW Screen Refurbishment 2017		
Meter Shop Test Console Replacement		
TRE6 Excitation System Replacement		
2017 Padmount Replacement Program		
IT - PI System Upgrade		
2017 Transmission Right of Way Widening		
2017 Telecom Building Replacement - Wittenburg		
HYD - Gulch Spillway Refurbishment		
2017 Transmission Line Retirement Program		
TRE6 Mills Refurbishment 2017		
2017/2018 Substation Polychlorinated Biphenyl (PCB) Equipment Removal Program		
LIN Railcar Positioner Refurbishment		
TRE6 Air Heater Refurbishment		
LIN CW Pump Refurbishment 2017		
TUC3 PE Generator Hydrogen Panel Replacement		
L6515 Replacements and Upgrades		
54H-303 Underground Device Replacements Phase I		
2017 / 2018 Steel Tower Life Extension		
4S-332 Bernard Lind Drive Conversion		
2017 Sacrificial Anode Installation Program		
LIN Mill Refurbishment 2017		
L5527 Replacements and Upgrades		
TRE6 Boiler Refurbishment		
5SV-313-Berwick North Replacements		
POT Boiler Refurbishment 2017		
TRE6 Analytical Panel Upgrade		
2017/2018 Isolated Structure Replacements	ATO approved October 18, 2022.	
LIN Coal Plant Structural Refurbishment Phase 3		
HYD - Milton Shop HVAC Upgrade		
TRE5 Boiler Refurbishments 2017		
Replace 69kV cables between 2S and 83S		
TRE6 - Condenser Waterbox and Cooling Water Piping Refurbishment		
L5027B Replacements and Upgrades	ATO approved July 19, 2018.	
TUC2 Cooling Water Piping Refurbishment		
TRE6 Bottom Ash Chain Replacement	ATO approved January 29, 2018.	
POT Coal Mill Overhauls 2017		
T&D Inspection Application Upgrade Phase 1		
512N-Toney River Replacements		
POT Boiler Chemical Reconditioning	ATO approved November 2, 2017.	
TUC2 Generator Bushing Replacement	ATO approved July 26, 2018.	
3N Oxford Conversion Phase 3		

Project Title	Comments/Notes	Variance Explanation Less Than 25% Varaince
3S Feeder Exit Cable Replacement		
LIN1 SH5 Boiler Tube Replacement	ATO approved September 12, 2017.	
50N-410 Rebuild Trenton	Subsequently approved >$250 in 2017 for $440,329.	
TRE Asbestos Abatement 2017	Subsequently approved >$250 in 2017 for $728,886.	
TUC HFO Tank Dyke Piping Refurbishments	Subsequently approved >$250 in 2017 for $664,753.	
LIN CEMS Replacement	Subsequently approved >$250 in 2017 for $633,355.	
TRE5 CEMS Replacement	Subsequently approved >$250 in 2017 for $679,922.	
L5053 Replacements and Upgrades		Due to contractor and material costs being less than initially estimated. Contingency was not required.
L5505 Replacements and Upgrades		Due to contractor and material costs being less than initially estimated. Contingency was not required.
2017 RTU Replacement Program		
23H-Rockingham Voltage Conversion-Phase 2		
2017 / 2018 Steel Tower Refurbishment		
L7012 Replacements and Upgrades		
L5004 Replacements and Upgrades		
2017/2018 Transmission Switch & Breaker Replacement		
509V Recloser and Voltage Regulator Replacement		
2017 PCB Pole Top Transformer Replacement		
POT - Fire System Upgrades 2017		
L7011 Replacements and Upgrades	ATO approved August 19, 2019.	
PTMT - Dock and Inhaul Conveyor Replacement	ATO approved January 26, 2018.	
L5535 Replacements and Upgrades	ATO approved June 15, 2018.	
IT – Generation Operations Upgrade		The number of servers required to complete this project was lower than estimated.
IT - Content Management System Replacement		
HYD Fixed Ladder & Machine Guard Upgrades		
LM6000 - 191-332 Hot Section and Engine Refurbishment		
TUC6 CW Screen Replacement		
AMO Fleet Environmental Data Management		
TUC HFO Piping Refurbishment	ATO approved August 14, 2019.	
LM6000 TUC5 Control System Upgrade		
LM6000 TUC4 Airhouse Upgrade		
IT - T&D WAM Phase 1 - GIS and Field Design System		
LM6000 TUC5 Airhouse upgrade		
TRE6 EHG/Turbine Controls Upgrade	FIN approved March 17, 2022.	Primarily due to using a non-OEM vendor, which had successfully completed implementation of the Trenton Unit 5&6 DCS upgrades, and the contingency amount not being required.
TUC2 Boiler Lower Vestibule Refurbishment		Components of the boiler that were estimated as requiring replacement did not need to be replaced upon inspection. This reduced contractor costs and contingency was not required.
TRE5 5-1 BFP Refurbishment		The scope of this project was to refurbish the BFP cartridge and bearings. Only the Cartridge was required leading to a reduction in contractor costs and contingency not being required.
20V-311-Bishop Ville Rd		Labour and traffic control required was less than originally estimated. Contingency was not required.
TRE5 Burner Refurbishments 2018		Replacement of the refractory originally included in the estimate was not completed as it was not required at that time. Contingency was not required.
2018 Wood Pole Retreatment Program		Due to contractor costs being less than initially estimated. Contingency was not required.
678H-211 McNab's Island Replacement		
16V-T2 Weymouth Hydro Transformer Replacement		
ICP Rail Crossing Refurbishment		
HYD Nictaux Canal Embank Refurbishment		
LIN CW Screen Refurbishment 2018		
16W-302H-Brenton Rd Rebuild		
TRE6 Lube Oil Cooler Refurbishment		
2018 Pin Insulator Replacements		
2018 Padmount Replacement		
HYD WRC Tunnel T-2 Intake Replacement		
LIN3&4 ACW Duplex Strainer Replacement		
2018 Transmission ROW Widening 69kV		
2018/2019 Sacrificial Anode Installation		
TRE5 PF Mill Line Replacement		
TUC2 Generator Flux Probe Installation		
TRE6 CEMS Replacement		
HYD Lequille Headpond Refurbishment		
New Distribution Rights-of-Way Ph 3		
LIN3 ID Fan Damper and VIV Refurbishment		
LIN Vaccuum Pump Upgrades		
LIN3 - Boiler Refurbishment 2018		
88W-323A Tusket Islands Phase 3		
TUC2 CEMS Replacement		
LIN Stack Re-Coating		
TUC2 H2 Panel Upgrades		
HYD - Fourth Lake Overhaul		
LIN4 Boiler Refurbishment 2018		
LIN3 Economizer Header Refurbishment		
TRE HFO Refurbishment Phase 1		
TRE5 Boiler Refurbishment 2018		
65V-301 Brickton Reconductor		
LIN1 SH5 Tube Replacement		
TRE5 Mill Refurbishments 2018		
HYD - Ruth Falls Facility Refurbishment		
PHB Boiler Refurbishment 2018		
LIN Mill Refurbishment 2018		
LIN CW Pump Refurbishment 2018		
HYD - Hells Gate 1 Overhaul		
48H-T1 Replacement		
LIN3 Turbine Valve Refurb 2018		
532N-Elm Street Conversion Phase 2		
POT Coal Mill Overhaul 2018		
LIN Coal Plant Structural Refurbishment		
TRE6 CW Screen Replacement 2018		
TRE5 Reheat Turbine Valves		
L5027A Replacements and Upgrades		
L5014-2018 Replacements and Upgrades		
L7002 Replacements and Upgrades		
LIN3 RH Tube Replacement		
LIN Reclaim Refurbishment Phase 2		
54H-303 Underground Device Replacement		
HYD - 4th Lake Penstock Refurbishment		
LIN4 RH Tube Replacement		
4S Feeder Exit Cable Replacement Phase 1		
54C-211 Queen Street Conversion		
2018 Tap Changer Replacements		
TRE5 Lube Oil Cooler Retube		
L5054 2018 Replacements and Upgrades		
TRE Asbestos Abatement 2018		
30N-411 Maccan River Rebuild		
15N-202 Victoria St Replace Deteriorated Assets	Subsequently approved >$250 in 2019 for $394,528.	
3S Feeder Exit Cable Replacement Phase 2		
TUC6 Main and Induction Stop Valve Refurbishment	Subsequently approved >$250 in 2018 for $335,693.	
87W-312G-Tancook Island Replacement		

Project Title	Comments/Notes	Variance Explanation Less Than 25% Varaince
HYD - RES Revenue Meter Replacement		
HYD - Dickie Brook Penstock Refurbishment		
HYD WRC Unit 1 Wicket Gate Thrust Assembly Refurbishment	Subsequently approved >$250 in 2018 for $928,320.	
2018 RTU Replacement Program		Due to contractor and material costs being less than initially estimated. Contingency was not required.
2018/2019 Capacitor Bank Breaker Replacement		Due to contractor and material costs being less than initially estimated. Contingency was not required.
2018 PCB Removal Program		
2018/2019 Transmission Switch & Breaker Replacement		
1C-GT1/UT1 Replacement		
2018 Telecom Building Replacement		
2018 Sub Recloser Replacements		
HYD - WRC Main Access Rd Refurbishment		
Mount Hope 69-25kV Substation		
HYD - WRC HVAC Upgrade		
2018 PCB Pole Top Transformer Replacement		
56N-T1 Transformer Upgrades		
2018 Substation Insulator Replacement		
2018/2019 Steel Tower Refurbishment		
L6549 2018 Replacements & Upgrades		
2018 Oil Containment Program		
L5564 Replacements and Upgrades		
L5039 - 2018 Replacements and Upgrades		
POT Boiler Refurbishment 2018		
65-223-Harold Street Conversion		
50N-410 Rebuild Phase 2		
30N-412 Hwy 242 Fundy Shore Rebuild		
55V-314GA-Welsford Reconductor		
L6537 Replacements and Upgrades	ATO approved July 26, 2019.	
HYD - Malay Falls Switchgear Replac		
TUC Heavy Fuel Oil Tank Dyke Refurbishment		
IT - Database Infrastructure Segregation		
IT - Security Operations Center (SOC) and Security Information Event Monitoring (SIEM)		
IT – Microsoft Exchange Upgrade (Replaces CI 49858)		
AMO T&D Asset Management Performance Tool		
2019 Telecom Building Replacement		
MCC - HVAC Replacement	ATO Approved November 16, 2021	
TRE6 - Generator High Voltage Bushings Replacement		Materials savings resulted from a competitive RFP process and contingency was not required.
TRE5 - CW Screen Refurbishment		Tail sprockets and bushings did not require replacement as initially estimated. Contingency was not required.
HYD - Malay Falls Unit 6 Generator Refurbishment		Generator refurbishment was able to be completed offsite resulting in both labour and contract savings. Contingency was not required.
LIN4 - Burner Front Refurbishment		The conditions of the burner fronts were favorable and allowed for a quicker refurbishment reducing contract costs.
LIN4 - Economizer Header Refurbishment		
TRE - (Bunker C) HFO Refurbishment Project Phase 2		
TRE5 - Post Cooler Conveyor Refurbishment		
POT - Asbestos Abatement 2019		
HYD - Malay Falls Unit 6 Overhaul		
TRE6 - Parallel Slide Valve Replacement		
TRE5 - Baghouse Filter Replacement Phase 2		
HYD - Wreck Cove Station Service Cable Replacement		
TRE5 - Turbine Main Valve Refurbishment		
HYD - Mill Lake Surge Tank Replacement		
PHB - Boiler Refurbishment 2019		
CT - BGT Replace Halon Fire Protection		
TRE5 - Bottom Ash Seal Replacement		
LIN - 1&2 CEMS Replacement		
POT - IP-LP Turbine Refurbishment		
New Distribution Rights-of-Way Widening Phase 4		
HYD - Tidewater 2 Overhaul		
HYD - Wreck Cove Brook Dam D-9 Refurbishment		
POT - Generator Auxiliary Equipment Refurbishment		
POT - Turbine Valve Refurbishment		
POT - Boiler Refurbishment 2019		
23H-303 - Willett Street Underground Replacement		
LIN - CW Pump Refurbishment 2019		
L5548- Replacements and Upgrades		
POT - HP Turbine refurbishment		
LIN4 - Boiler Refurbishment 2019		
2019/2020 Steel Tower Refurbishment		
TRE - Asbestos Abatement 2019		
LIN - Reclaim Feeder Refurbishment Phase 3		
TUC - UT3 and ST34 Cable Replacement		
TRE6 - Boiler Refurbishment 2019		
LIN3 - Boiler Refurbishment 2019		
LIN - CW Screen Refurbishment 2019		
L5541 -Replacements and Upgrades		
TRE6 - Mills Refurbishment 2019		
TUC1 - CEMS Installation		
65-224 - Birch Hill Drive Conversion		
22W-311GA - Hawk Point Road Reconductor Replacement		
L7005 -Replacements and Upgrades		
LIN3 - Reheat Tube Replacement 2019		
855-401 Cabot Trail Rebuild		
L5511 - Replacements and Upgrades		
TRE5 - Boiler Refurbishment 2019		
TUC - Waste Water Treatment Plant Controls Upgrade		
LIN4 - Reheat Tube Replacement 2019		
54H-304 - Underground Device Replacement		
POT - Air Heater Refurbishment		
POT - Coal Mill Refurbishment 2019		
LIN - Coal Plant Structural Refurbishment Phase 5		
LIN - Mill Refurbishment 2019		
POT - Hydrogen Panel Replacement		
HYD - Wreck Cove Crane Refurbishment		
PTMT – Shuttle Belt Replacement	Subsequently approved >$250 in 2019 for $658,560. Previously submitted in 2019 ACE under CI C0011418	
LIN4 - Bottom Ash Refurbishment		Due to contractor and material costs being less than initially estimated.
LIN Fly Ash Precipitator Component Refurbishment		
2019 Oil Containment Program		
64N Lourdes Street Conversion Phase 1		
2019/2020 Steel Tower Life Extension		
70W-311G - Crousetown Road Phase Extension		
L5026 -Replacements and Upgrades		
2019/2020 Substation Polychlorinated Biphenyl (PCB) Equipment Removal		
ICP - Rail System Refurbishment Program 2019		
TRE - Rail Car Fuel Delivery Upgrade		

Project Title	Comments/Notes	Variance Explanation Less Than 25% Varaince
2019/2020 Transmission Switch & Breaker Replacement		
2019 Transmission Right-of-Way Widening 69kV		
102W-311 - Jedediah Rd Rebuild		
2019 Padmount Replacement Program		
2019/2020 Sacrificial Anode Installation Program		
L5551 - Replacements and Upgrades		
POT Diesel Generator and Essential Services Switchgear Replacement		
TRE - Sludge Dewatering Infrastructure		
L6549 - Replacements and Upgrades Phase 2		
2019 Tap Changer Replacements/Refurbishments		
15N-202 - Dominion St and Arthur St Rebuild		
HYD Bridge Replacements		
D-2019 PCB Pole Top Transformer Rep		
IT – ADMS Upgrade		
IT - Microsoft Enterprise Agreement 2020		
IT Windows Server 2008 Upgrade		
IT Enterprise Data Lake		
50N-410 – 4C-430 Highway 104 Twinning		
LIN Heavy Oil Tank Refurbishment		
AMO Distribution APM Program		
AMO Substation and Trans APM Progra		
L5550 Replacements and Upgrades Phase 1		
HYD - Lake Mulgrave Dam Refurbishments		
HYD - Weymouth Falls Unit 1 Generator Refurbishment		
L5524 Replacements and Upgrades		
TUC3 Turbine Valves Refurbishments		
48H Metalclad Switchgear Replacement		
LM6000 TUC4 Control System Replacement		
93V-313-Meteghan Rebuild		
L7005 Replacements and Upgrades Phase 1		
Trenton 50N-T13 Replacement		
Willow Lane 15N-T3 Replacement		
2020 Padmount Replacement Program		
19W-T51 Transformer Replacement		
New Distribution Rights-of-Way Phase 5		
L7019 Replacements and Upgrades		
2020 Transmission Right-of-Way Widening 69kV		
L8001 Replacements and Upgrades Phase 1		
2020/2021 Transmission Switch & Breaker Replacement		
2020/2021 Wood Pole Retreatment		**Due to a reduction in scope, approximately 1,190 fewer poles required treatment.**
2020/2021 Substation PCB Equipment		
2020-21 Inaccessible PCB Transf Rep		
IT-Customer Energy Management		
IT - Work and Asset Management		
Heckman Island Underwater Cable Rep		
LM6000 - 191-443 Hot Section Engine Refurbishment	FIN approved November 14, 2022.	
IT - Privilege Access Management (PAM)		
TUC3 HP Turbine Refurbishment		
2021 Padmount Replacement Program		Due to contractor and material costs being less than initially estimated. Contingency was not required.
2021/2022 Transmission Right-of-Way Widening 69kV		
New Distribution Rights-of-Way Phase 6		
L6020 Replacements and Upgrades		
L5054 Line Replacements and Upgrade		
2021/2022 Substation Polychlorinate		
L6516 Line Replacement and Upgrades		
2021-22 Transmission Switch & Break		
New Spare Large Autotransformer		
2021-2022 Steel Tower Refurbishment		
IT – Endpoint Security		
L8001 Replacements and Upgrades Phase 3		
HYD - Trout River Diversion Structure Replacement		
L5534 Replacements and Upgrades		
CT - VJ1 Generator Replacement		Due to savings in contract and labour costs. Contingency was not required.
L5550 Replacements and Upgrades Phase 2		Due to favourable site conditions and contingency not being required.
L5022 Replacements and Upgrades		Due to contractor and material costs being less than initially estimated. Contingency was not required.
L8001 Replacements and Upgrades Phase 2		
PHB – 2022 Turbine Refurbishment		
LIN1 L-0 Blade Replacement		
L7002 Replacements and Upgrades Phase 2		
TUC3 Generator Refurbishment		
CT - VJ1 Control System Upgrade		
L5537 Replacements and Upgrades		**Primarily due to more favourable site conditions leading to less bog matting being required.**
L6020 Replacements and Upgrades Ph2	**FIN approved November 12, 2024.**	**Due to increased scope that was determined upon detailed engineering being completed.**
L7005 Replacements and Upgrades Ph2		
2022 2023 Sacrificial Anode Inst Pr		
2022 Padmount Replacement Program		
2022/2023 Trans ROW Widening 69kV		
New Distribution ROW Phase 7		
IT - Microsoft Enterprise Agreement Renewal		
IT-Customer Energy MangementPhase2		
TUC HFO Tank 4 Refurbishment		
Replenish Spare used at 58C		
IT- Cisco UCS Lifecycle		
62H Low Voltage Switchgear Replacem		
IT-Backup Infrastructure Upgrade		
CT LM6000 Engine 191-253 Refurbishm	**ATO approved June 17, 2024.**	
TUC2 - Turbine Valves Refurb 2023		
2023 Padmount Replacement Program		
TUC2 L-0 Blade Replacement		
TUC - HFO Tank No.3 Refurbishment		
HYD - COW 11 Overhaul		
LIN 824 Wheeled Dozer Replacement		

ACE Plan Decision, CI C0021102 - L0529 Replacements and Upgrades has been removed from the data above. This project was origi

Business Area	Total Project Savings	Project Number	Project Name	Attributed To	Reason for Savings	Details of Cost Savings or Efforts Made
Hydro	$ 121,844	29807	Tusket Main Dam Refurbishment Project	Consulting	Design Engineering Adjustment	Upon completion of the 2023 wetland monitoring program a recommendation to halt the required 5-year monitoring program (condition of previously granted environmental permits) two years early and complete the functional assessment in 2024, was made, and accepted by NSECC & DFO.
Steam	$ 250,000	C0050908	TUC Stoplog Replacement	Consulting	Design Engineering Adjustment	Replaced wooden stoplogs with steel dam plate like other units at TUC. In the short term, this avoided major restorative works to the concrete intake structure around the checks, and the steel plate has a much longer life expectancy.
Steam	$ 80,000	C0068466	TUC1 CW inlet Pipe Base Refurb	Materials	Design Engineering Adjustment	A change in work scope, how the connection to the concrete was complete, resulted in less belzona product required, thus reducing material costs.
Steam	$ 100,000	C0055169	TUC Stack Platform Replacement	Contracts	Procurement Negotiations	Competitively bid the fabrication and demo work separately which reduced overall costs.
Steam	$ 28,720	C0041529	TUC4 Add SOV in Demin Water Return	Other	Design Engineering Adjustment	Simplified remediation of back flow gases issue in the LM6000 building by implementing a common industry-accepted method of installing two check valves of differing types in series to reduce the likelihood of failure of both valves.
Steam	$ 28,720	C0041531	TUC5 Add SOV in Demin Water Return	Other	Design Engineering Adjustment	Simplified remediation of back flow gases issue in the LM6000 building by implementing a common industry-accepted method of installing two check valves of differing types in series to reduce the likelihood of failure of both valves.
Hydro	$ 6,000	C0058423	WRC Access Tunnel East Wall Rock Bolting	Materials	Efficiencies - Material	Through working with the contractor, existing trailers on site were used for East Wall nightshift work in February 2024 instead of transporting their own, helping avoid a 6-week rental period, along with the associated setup, disconnect, and cleaning costs.
Hydro	$ 81,962	C0058423	WRC Access Tunnel East Wall Rock Bolting	Labour	Efficiencies - Process	Original plan included a site supervisor and a safety specialist. However, through the vetting process of hiring the site supervisor, it was determined that their background in safety management could be actioned, thus reducing the need for both positions.
Hydro	$ 6,000	C0027342	WRC Tailrace Rockbolting	Materials	Efficiencies - Material	By utilizing an existing trailer for the operations related to the access tunnel/tailrace project for approximately three months, cost savings were achieved from not having to rent an additional trailer.
Steam	$ 80,000	C0065126	TUC FAC Refurbishment 2024	Materials	Design Engineering Adjustment	The team at TUC was able to determine the requirements, locally source and put together soft good kits that are required to perform inspections and maintenance on feedwater valves. By doing this internally instead of sourcing through the OEM, the overall cost was reduced substantially as well as avoiding delays due to long lead times.
Steam	$ 8,000	C0067468	TUC6 HSRG Boiler Refurb	Contracts	Efficiencies - Process	NS Power purchased a drone and had an employee licensed to operate it, as opposed to contracting out drone services at a more costly per day rate.
Hydro	$ 29,561	29807	Tusket Main Dam Refurbishment Project	Consulting	Efficiencies - Process	When NS Power submitted its application for a watercourse alteration approval to NSECC to complete cofferdam rock removal from the Tusket River in 2024 it indicated that within the submitted errosion & sedimentation control plan that water quality testing would be completed by its construction supervisor rather than an independent third party. This was a deviation from the granted 2023 permit for the same work which required an independent party to complete the testing activities. NSECC accepted the change in the plan from 2023 to 2024 and granted the permit as requested.
Hydro	$ 3,790	29807	Tusket Main Dam Refurbishment Project	Consulting	Efficiencies - Process	It was decided to only invite representatives from Davis MacIntyre Archaeologists to attend the Mi'kmaq Working Group meetings when they had information to share regarding the results of their investigations.
Steam	$ 230,000	C0048650	TUC6 AVR Replacement	Materials	Procurement Negotiations	Through procurement activities, it was determined that NS Power could go to a non-OEM AVR as opposed to OEM, leading to material savings.
Steam	$ 15,000	C0055382	TUC Oil Tanks Levels & Pump House Controls	Labour	Efficiencies - Process	Utilized internal labour instead of contractor.

Business Area	Total Project Savings	Project Number	Project Name	Attributed To	Reason for Savings	Details of Cost Savings or Efforts Made
Transmission	$ 11,348	C0068697	L6038 & L5004 Relocation near 129H Kearney Lake Substation	Contracts	Efficiencies - Process	Conduct tree trimming and archeological study to cover both discipline scopes (Transmission and substation) for the 129H substation line relocation L6038 and L5004 project & the 129H substation expansion project. In addition, the archeological study included the review for another project (L5004 Kearney Lake), due to the projects being geographically located in proximity. Combining all 3 scopes (archeological studies) into one job resulted in cost savings. This strategy also allowed the projects to reduce execution time and other administrative inefficiencies, which would cost more if the 3 archeological scopes were separated. In Summary, this project optimization resulted in saved effort, reduced cost and improved efficiency in progressing both projects.
Hydro	$ 22,500	C0049032	HYD COW hoist Replacements	Contracts	Efficiencies - Process	Removal of old hoists at both locations done internally rather than contracted out in advance of new hoists being delivered.
Hydro	$ 22,500	C0049013	HYD LGB hoist Replacements	Contracts	Efficiencies - Process	Removal of old hoists at both locations done internally rather than contracted out in advance of new hoists being delivered.
Hydro	$ 10,000	48914	HYD - Malay Falls Facility Refurb	Contracts	Efficiencies - Material	Rather than mob/demob of new construction trailer on site, NS Power worked with contractor so that they could re-use existing trailer on site from MAL Switchgear Replacement that had been used by a different contractor.
Transmission	$ 10,080	T011	Planned Transmission Line Replacement/Upgrades Routine	Contracts	Efficiencies - Process	The use of an alternative access route was used to save 80 mats, resulting in savings.
Transmission	$ 49,080	T011	Planned Transmission Line Replacement/Upgrades Routine	Contracts	Efficiencies - Process	The use of alternative access routes and work procedures resulted in reducing 400 mats required to execute work, resulting in savings.
Transmission	$ 14,722	C0065606	2024 2025 Sacrificial Anode Installation	Contracts	Efficiencies - Process	Matting savings were achieved because NS Power is managing the matting contractor directly as opposed to having the line service contractor manage the matting contractor with a mark up applied. The savings total is the difference between the 15% mark up which would have been applied to matting costs if managed by the line service contractor and the labour costs for NS Power to manage the matting contractor directly.
Transmission	$ 80,000	C0050835	2023 2024 Steel Tower Refurbishment	Labour	Efficiencies - Process	Cost savings were achieved by actively refurbishing steel throughout numerous steel tower grillages in conjunction with NS Power's Sacrificial Anode Installation project. This resulted in savings with respect to company mobilization, access, and traffic control costs as the equipment and crew were already on-site to install sacrificial anodes.
Hydro	$ 20,000	C0036368	HYD - LGB Switchgear Replacement	Labour	Efficiencies - Process	Had approximately 30 drawings updated in house rather than contracting out.
Hydro	$ 10,000	C0036149	HYD Hydro Protection Relay Tester	Materials	Procurement Negotiations	Procurement negotiations with the supplier successfully reduced the purchase price.
Steam	$ 50,834	C0068197	TRE6 Polishers	Materials	Salvage	Rebuilt parts to address and resolve issue, instead of full replacement.
Transmission	$ 246,000	C0053316	Michelin - DVR	Materials	Procurement Negotiations	Used NS Power approved supplier as opposed to contractor completing work to provide material, thus avoiding material markup.
Transmission	$ 250,000	C0053316	Michelin - DVR	Contracts	Efficiencies - Material	Sourced local conduit backfill materials that met thermal design requirements vs trucking specialized materials from Lefarge Manitoba. NS Power challenged design and worked with the civil contractor to test and certify local supply for thermally conductive trench fill.
Transmission	$ 1,062,500	C0053316	Michelin - DVR	Materials	Procurement Negotiations	Used NS Power's current master services agreement with an electrical works contractor to achieve better rates as opposed to using current contractor's subcontractor.
Transmission	$ 500,000	C0053316	Michelin - DVR	Materials	Procurement Negotiations	Competitively sourced capacitor banks vs going through general contractor, thus achieving a better price and avoiding additional mark up from the general contractor.
Hydro	$ 56,000	C0000982	Governor Dam Refurb	Materials	Procurement Negotiations	Savings relate to procurement of the Eel Passage (mechanical components). After obtaining quotes for the supply and installation of the eel passage , it was decided to reach out to other manufacturing vendors to obtain pricing in the attempt to lower the supply costs of the eel passage.
Hydro	$ 9,835	29807	Tusket Main Dam Refurbishment Project	Travel/Accommodations	Efficiencies - Process	Found a local construction supervisor rather than one who would require travel and lodging costs for a remote location.

Business Area	Total Project Savings	Project Number	Project Name	Attributed To	Reason for Savings	Details of Cost Savings or Efforts Made
Hydro	$ 75,000	29807	Tusket Main Dam Refurbishment Project	Other	Procurement Negotiations	Used a local storage facility for gates instead of other options (like storage at a local storage facility).
Hydro	$ 100,000	29807	Tusket Main Dam Refurbishment Project	Contracts	Efficiencies - Material	100 sandbags were required for rock removal, however instead of purchasing new, re-used them from another Hydro project at no cost.
Transmission	$ 187,832	C0041788	L6516 Replacements and Upgrades Ph2	Contracts	Efficiencies - Process	Project was able to access the structures via an easier route, thus reducing the amount of matting required.
Transmission	$ 54,932	T001	Provincial - Unplanned Transmission Line Replacements	Contracts	Efficiencies - Process	Project was able to access the structures via an easier route, thus reducing the amount of matting required.

CEJC Revisions

Section (Summary/Detailed)	Summary CEJC Page #	Detailed CEJC Page #	Substantive/ Non-Substantive	Revision Description
System Design (17.8)	49 of 55	68-70 of 114	Non-Substantive	Edits to align language with updated System Design Criteria - Updates for clarity to the definition wording of Primary, Secondary and Electrically Remote Transmission and Breaker Back-Up (pages NA/69) - Updates to create alignment with existing system design criteria to the required prime and back up clearance times following a system disturbance (pages NA/69)
Appendix C: System Design Criteria	NA	103-114 of 114	Non-Substantive	Updated System Design Criteria - Normal system condition definition to include mention of consideration for environmental or regulatory policy impacts on dispatch (pages NA/109) - Radial Transmission Policy - updates to the CEJC to align with documentation shared in past proceedings (2023 Distribution Routine ATO) (pages NA/114)

NOVA SCOTIA POWER INC. CAPITAL PLANNING & CAPITAL EXPENDITURE JUSTIFICATION CRITERIA
Summary Document

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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1.0 Definitions

Annual Capital Expenditure (ACE) Plan: A document containing details regarding all of NS Power's capital projects planned for a given calendar year. The ACE Plan is submitted to the UARB every year.

Authorization to Overspend (ATO): A capital work order package for submission to the UARB should the project forecast final costs with a variance of more than the greater of 5% or $250,000.

Bulk Power System: The interconnected electrical systems within northeastern North America comprising generation and transmission facilities on which faults or disturbances can have a significant adverse impact outside of the local area.

Carry Over Project: A capital project that is approved and initiated in one calendar year, but the investment of capital carries over into the subsequent year(s).

Capital Cost: The cost required to complete a capital project.

Capital Cost Allowance: A yearly deduction of depreciation that can be claimed for income tax purposes on the cost of certain assets.

Capital Expenditure Justification Criteria (CEJC): The criteria contained in this manual defining matters related to capital expenditures. The CEJC contains the criteria defining what, why and when a project qualifies as a capital project.

Capital Identification (CI) Number: The unique identification number associated with a capital project.

Capital Lead: Employee responsible for technical and financial justification of capital work from a particular area (e.g. generation), program (e.g. reliability), or function (e.g. system reinvestment).

Discounted Payback Period: This is a measure of economic value. It represents the number of years required to pay back the initial capital cost of a project. It measures the levered payback period.

Discretionary Project: Investments that are incremental to an essential capital investment and which are made solely on the basis of economics, and there is an acceptable "do-nothing" alternative. Discretionary projects may yield defined benefits that minimize the revenue requirements of NS Power.

Do Nothing Alternative: A "do nothing" alternative refers to the alternative to not proceed with a discretionary capital project with corresponding acceptable outcomes. Whereas discretionary projects are based solely on economics, they are not addressing safety, legal, reliability or technical scenarios, and therefore "doing nothing" results in little or no risk to NS Power's system.

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Economic Analysis Model (EAM): The standard software model used by NS Power to calculate the present value of revenue requirement and economic value of any project. The software takes capital costs, avoided costs, revenue, expenses, and taxes into consideration to give a Net Present Value (NPV), internal rate of return (IRR), and discounted payback period.

Economically Justified Project: A capital project that is justified, in part, on economic benefits. The Economic Analysis Model (EAM) is used to derive the economic benefits of all economically justified projects. Economically justified projects may also be justified on other technical justifications.

Environmental Project: A capital project that is justified on the basis of environmental criteria. These criteria include operating permit approval, Environmental Act or regulation compliance, regulatory standards and industry standard compliance.

Essential Project: A capital addition or replacement which must be made to satisfy technical, legal, safety, regulatory or environmental directives.

Executive: A member of the NS Power Executive Team including General Managers, Vice Presidents, Executive Vice Presidents and the President and CEO.

Final Cost (FIN): A capital work order package for submission to the UARB should the project experience a scope change or if final costs result in a variance of more than the greater of +/- % or +/- $250,000. FIN capital work orders consist of final cost details and a variance analysis.

Individual Capital Item: Individual capital items, typically of a non-repetitive nature, and justified and budgeted separately from capital routines.

Integrated Resource Plan: A long-term planning process and framework within which the costs and benefits of both demand and supply side resources are evaluated to develop the least total cost mix of utility resource options.

Information Request (IR): A request from the Utility and Review Board (UARB), or other intervenors, for additional information pertaining to a capital project.

Internal Rate of Return (IRR): The discount rate used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake the project. As such, IRR can be used to rank prospective projects. Assuming all other factors are equal among the various projects, the project with the highest IRR would likely be considered the best and undertaken first.

Investment Review Team (IRT): The IRT is composed of a diverse group of Directors and Managers who offer expertise and experience from different functional areas within NS Power. The IRT manages NS Power's capital program in an integrated manner ensuring that projects are

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prioritized across NS Power. Investment initiatives are continuously monitored and the status of the capital program is communicated to NS Power's Leadership Team.

Leadership Team: Senior Managers, Directors and Executive of NS Power.

Planned and Advanced (P&A): A capital item that is planned (foreseen and budgeted) in future years but advanced for commencement and/or completion in the current year. They are not U&Us despite not being referenced in prior ACE Plans.

PowerPlan (software): The software that is used to manage all aspects of capital projects including project scope, justification, budget, approvals and actual project information. The software can be used to research information on past projects and forecast project activity into the future.

Production Costing Model: A system modelling tool which provides detailed forecasts of fleet dispatch and production costing, reflecting the increasing complexity of the system. Used in the calculation of replacement energy costs.

Routine Capital Item: A capital item containing a number of projects that are high volume, repetitive, like-for-like capital replacements, enhancements, or additions that are expected to continue into the foreseeable future.

Safety Project: A project that is justified based on the basis of health and safety criteria. Some of these criteria include regulatory requirements, Nova Scotia Department of Labour orders, NS Power safe work methods/practices, revisions to industry standards, Joint Occupational Health and Safety Committee (JOHSC) actions and mitigating risk of potential health and safety incidents.

Special Protection System (SPS): A protection system designed to detect abnormal system conditions, and take corrective action other than the isolation of faulted elements. Such action may include changes in load, generation, or system configuration to maintain system stability, acceptable voltages or power flows. Automatic underfrequency load shedding, as defined in the NPCC Emergency Operation Criteria A-3, is not considered a Special Protection System. Conventionally switched, locally controlled shunt devices are not Special Protection Systems.

Total Cost of Ownership (TCO): The upfront capital cost of a new or upgraded capital asset plus all capital costs and operating expenses over its expected useful life.

Unforeseen and Unbudgeted (U&U): A capital item that develops throughout the year, typically in response to discoveries made through routine inspections, maintenance, and/or unplanned failures, and was not included in prior ACE Plans or the current ACE plan. Projects foreseen and budgeted for future years, but advanced for commencement and/or completion in the current year, are not U&Us despite not being referenced in prior ACE Plans (these are designated as P&A projects). A U&U is submitted because the capital item cannot wait until the next ACE Plan for approval.

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Utility and Review Board (UARB): Pursuant to the Public Utilities Act, the Nova Scotia Utility and Review Board ("NSUARB" or "Board") exercises general supervision over all electric utilities operating as public utilities within the Province.

Weighted Average *Cost of Capital (WACC)*: The cost of capital (discount rate or interest rate) determined by the weighted average, at forecasted book value, of the cost of all financing sources (debt, corporate bonds, equity) in the capital structure of NS Power. The weighted average cost of capital (WACC) is determined by the Finance Team and incorporated into the Economic Analysis Model (EAM) in order to determine the Net Present Value (NPV) and discounted payback of a capital project

Acronyms

ACE	Annual Capital Expenditure
ACHI	Avoided Customer Hours of Interruption
AFUDC	Allowance for Funds Used During Construction
AO	Administrative Overhead
ASTM	American Society for Testing and Materials
ATO	Authorization to Overspend
CAIDI	Customer Average Interruption Duration Index
CCA	Capital Cost Allowance
CEJC	Capital Expenditure Justification Criteria
CI	Capital Item
CO	Carry Over
CSA	Canadian Standards Association
EAM	Economic Analysis Model
FIN	Final Cost
DEP	Distribution Engineering Practices
IR	Information Request
IRP	Integrated Resource Plan
IRR	Internal Rate of Return
IRT	Investment Review Team
MC	Measurement Canada
NERC	North American Electric Reliability Corporation
NPCC	Northeast Power Coordinating Council
NPV	Net Present Value
NS Power	Nova Scotia Power Incorporated, “the Company”
P&A	Planned and Advanced
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SPS	Special Protection System
UARB	Nova Scotia Utility and Review board, “UARB” or “Board”

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U&U	Unforeseen and Unbudgeted
WACC	Weighted Average Cost of Capital

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
Detailed Document

2.0 Introduction

In its 1995 ACE Plan Decision, the Board provided the following:

> By an Order dated January 5, 1995 the Board directed that Nova Scotia Power Inc. (NS Power, the Utility, the Company) file evidence relating to its 1995 Annual Capital Expenditure (ACE) Plan by January 12, 1995, and set March 6, 1995 as the commencement date for a hearing.
>
> In an exchange of correspondence between the Company and the Board in early 1994, an understanding was reached that NS Power would make a yearly presentation of its Annual Capital Expenditure Plan and that NS Power would ensure work orders for projects less than $1 million meet Board approved technical and financial capital expenditure justification criteria. The Board indicated that it would undertake periodic audits on samples of work orders to ensure that such criteria had been satisfied.[1]

Those technical and financial justification criteria are contained in this document, the Capital Expenditure Justification Criteria (CEJC).

NS Power is a public utility, subject to the provisions of the Public Utilities Act (the Act). NS Power is subject to general supervisory oversight of the UARB. Prior to October 30, 2019, each capital item in excess of $250,000 required approval by the UARB. Section 35 of the Act was amended on that date to raise this limit to $1,000,000 for "large scale public utilities", which is defined under the Act as a public utility with an annual revenue of one hundred million dollars or more. Accordingly, NS Power can carry-out capital work on projects of $1,000,000 or less in value without UARB approval. The UARB can perform periodic audits to ensure that the criteria are being properly applied. Projects found to be inappropriately justified or imprudent can be excluded from NS Power's rate base.

[1] 1995 ACE Plan UARB Decision (March 31, 1995) NS Power-P-866-DEC.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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3.0 Administration

This document will be maintained by NS Power. Pursuant to the Board's 2016 ACE Plan Decision directives, revisions to the CEJC will be reviewed by stakeholders prior to filing with the UARB. The CEJC will be filed with the Board, with revisions noted for the Board's approval, as required. Revisions to this document will be accompanied by a brief review of the updates or changes. A corresponding Detailed CEJC will be provided for the Board's information.

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4.0 NS Power Commitment

NS Power will manage its capital expenditures in accordance with the principles and guidelines contained within this document. The CEJC is applicable during all phases of the capital approval process. This begins during the development and submittal of the ACE Plan and continues until the project is complete and receives final cost approval.

NS Power is committed to:

- Delivering effective and efficient service to NS Power customers;
- Providing the assurance that NS Power is using sound and consistent economic, financial and technical criteria to justify capital expenditures;
- Effectively responding to changing environmental, operational, technical, safety and financial conditions in compliance with legislative and regulatory requirements; and
- Providing complete and timely capital filings for Board consideration and approval.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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5.0 Objectives

The objectives of the CEJC are as follows:

- To provide assurance that NS Power is using consistent economic, financial and technical criteria to justify all capital expenditures;
- To provide assurance that the capital expenditures result in the maximum benefit for customers and minimum impact to rates;
- To communicate the NS Power's justification requirements to all personnel involved in the execution and approval of capital projects in a clear and structured manner;
- To provide the assurance NS Power has appropriate levels of accountability regarding the oversight of the capital processes;
- To ensure that the justification criteria reflect a multi-disciplined approach to justifying capital expenditures using current financial and technical standards; and
- To support the use of consistent practices within NS Power.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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6.0 Overview of Capital Planning

6.1 Summary of Capital Planning, Budgeting & Execution Process

NS Power's capital program is overseen by the Company's Investment Review Team (IRT). The IRT is chaired by a senior NS Power employee in the capital planning business function, and the team is composed of a diverse group of Directors and Managers who offer expertise and experience from different functional areas within NS Power. The IRT manages NS Power's capital program in an integrated manner ensuring that projects are prioritized across the Company, investment initiatives are continuously monitored and the status of the capital program is communicated to NS Power's Leadership Team.

The initial phase in the preparation of the ACE Plan is compiling a project list to collect all pertinent information about the capital projects that may be included in the ACE Plan. This requires coordination between the generation, transmission, distribution and corporate groups, Asset Management, Finance and Regulatory Affairs.

In Generation, Transmission, Distribution, and Information Technology (IT), the process begins at the start of each year with the functional groups compiling information about projects that require consideration for the following year.

As this information is gathered, each functional lead will input information into NS Power's capital management system, PowerPlan. The addition of a project to PowerPlan requires the inclusion of a project title, project description, project justification, capital cost spending profile and identification of primary and secondary justification criteria (ranking category).

Projects identified within PowerPlan are reviewed by capital planning and division management for each function. There is a standard ranking methodology for Generation, Transmission, Distribution, and Information Technology, which is described in further detail below.

Generation, Transmission and Distribution projects are broadly ranked using the following criteria:

- Health and Safety: Regulatory requirements, Operating Permits, Protection of Equipment and Personnel Safety, and JOHSC actions.
- Environmental/Regulatory Compliance: Renewable Energy Standards, Greenhouse Gas (GHG) Regulations, or Air Emission Regulations.
- Business Sustainability: SAIDI, SAIFI, CAIDI; unit reliability; system upgrade requirements; code requirements; NERC/NPCC Requirements, or economics (based on payback period, and revenue requirement); requirement to serve.

Technically justified IT projects are broadly ranked using the following criteria:

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- Customer: service impacts to customers as a result of technical failure
- Finance: financial impacts to the Company as a result of technical failure
- Compliance: safety, environmental, security, legal or regulatory requirements (e.g. NERC/CIP and NI-52 compliance)
- Operating Sustainability: ability for NS Power staff or contractor to perform critical functions of the business.

Each year, the capital program includes those projects which are essential for health and safety objectives, regulatory compliance, those which are required to provide service to a given area, and mitigate risks. Projects which serve to improve customer reliability are evaluated based on the probability factors related to performance targets (SAIDI, SAIFI, CAIDI). Economic initiatives are evaluated based on their economic and performance ranking. The capital program can be constrained by a number of factors including the ability to effectively execute the annual program with the available time and resources, the maintenance cycle of the generating facilities and company cash flow.

The NS Power Executive approval process involves a detailed review of the consolidated ACE Plan. Division management work with the executive team to address any comments or concerns which may arise from this review.

Following this review and approval, final changes to the capital plan are made and the ACE Plan is compiled for submission to the UARB. Included as part of this process is the identification of projects that are not ready for formal submission to the UARB for review and approval. These projects are noted on the Subsequent Submittal list in the ACE Plan. While these projects continue to form part of the total ACE Plan budget, submission to the UARB for review and approval is deferred until they are filed separately later in the year.

NS Power's capital program is intended to be dynamic and flexible in accordance with a complex business. Revisions may include scope changes, timing changes, costing updates, new project additions, etc.

6.2 Ranking Process

Generation, Transmission, Distribution, and Information Technology

Each Generation, Transmission, Distribution, and Information Technology capital project is ranked using the criteria provided in the matrices below. The ranking process is completed first in the early stages of project development and continues to be refined as the scope and estimated costs for the capital project are further defined. All rankings are reviewed by a centralized Investment Review Team to ensure the projects are justified and appropriate for

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inclusion in the ACE Plan.

The scale of the rankings is detailed in the matrices below.

Criticality and Condition values are typically influenced by one predominant factor and ranked accordingly. However, other factors may also influence the ranking of a project. In the event that multiple factors are present for a project, individual rankings will be taken into consideration in determining the overall Criticality rankings. For example, Health and Safety considerations for a project may warrant a Criticality ranking of serious (3), while Environmental considerations for the same project may also independently warrant a Criticality ranking of serious (3); this project may therefore warrant a higher Criticality ranking due to multiple influencing factors.

The four colours of the ranking matrix are a visual representation of the likelihood of a capital project being completed. A project falling within the red rankings is considered a high priority and should be completed. Projects falling within the orange and yellow rankings represent projects that carry a higher risk than the projects in the green rankings. While the colours provide a visual illustration of risk, the ranking numbers are the focus of the ranking process.

A lower ranking suggests a lower level of risk and urgency, but not always a lower level of priority. Lower ranked projects that fall in the green, yellow or orange rankings may be completed in certain cases. For example, a project that does not carry a high enough ranking may be completed during a planned outage if the condition of the asset is expected to deteriorate such that action would be required prior to the next available outage.

Considerations of multiple influencing factors, all rankings applied to projects under the ranking methodology noted above, and the order of completion of projects ahead of others, are all subject to the evaluation and professional judgment of NS Power staff and third party industry experts.

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ASSET MANAGEMENT CRITICALITY & CONDITION RISK ALIGNMENT MATRIX

Criticality (Based on Consequence)				CRITICALTY VALUE	RISK MATRIX				
Health & Safety	Environment	Business Sustainability	Consequence						
• Regulatory requirement breached. •Critical safety incident requiring support from external resources •Fatality or Permanent Disability.	• Regulatory requirement breached. • Loss of generating station or facility operating permit. • Critical liquid, chemical or particulate release with off-site or off-facility impact.	Business Sustainability Criticality Ranking is informed through factors such as replacement energy costs, Regulatory Requirements, SAIFI, SAIDI, DAFOR, System Upgrade Requirements, Code Requirements and Project Economics (payback period, NPV, Revenue Requirement).	Critical	5	5	10	15	20	25
• Major safety incident leading to JOHSC actions and controllable by internal resources. • Lost time Injury	• Corporate environmental target exceedence. • Major reportable environmental incident with off-site or off-facility impact.		Major	4	4	8	12	16	20
• Serious safety incident leading to JOHSC actions and controllable by internal resources. • Recordable injury, >1 medical Aid	• Serious reportable environmental release causing license exceedance and off-site or off-facility impact.		Serious	3	3	6	9	12	15
• Moderate safety incident controllable by internal resources and no JOHSC actions required. • Recordable injury, < 1 Medical Aid	• Moderate reportable environmental release without license exceedance and internal impact only.		Moderate	2	2	4	6	8	10
• Minor safety incident controllable by internal resources and no JOHSC actions required • First Aid Injury	• Minor non-reportable environmental release with internal impact only and no license exceedance.		Minor	1	1	2	3	4	5
					1	2	3	4	5
					Rare	Unlikely	Possible	Likely	Almost Certain

LEGEND

	Acceptability of Risk
High Risk	Requires Mitigation
Medium-High Risk	Considered for Mitigation
Moderate Risk	Acceptable
Low Risk	Acceptable

CONDITION

Condition Description	
Rare 1	Failure or occurrence is rare (0-10%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate of less than 1 in 100 operating years.
Unlikely 2	Failure or occurrence is unlikely (11-25%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate of less than 1 in 75 operating years.
Possible 3	Failure or occurrence is possible (26-75%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate between 1 in 10 and 1 in 75 operating years.
Likely 4	Failure or occurrence is likely (76-90%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate between once per year and 1 in 10 operating years.
Almost Certain 5	Failure or occurrence is almost certain (91-100%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate of greater than once per year.

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INFORMATION TECHNOLOGY ASSETS CRITICALITY & CONDITION RISK ALIGNMENT MATRIX

Business Criticality (Based on Consequence)					Criticality Value
Customer	Finance	Compliance	Operational Sustainability	Criticality	
Loss of a service for all customers	Financial Impact > $30m	Breach of compliance with any of safety, environmental, security, legal or regulatory requirement	Employees could not perform their role or an employee / contractor could not perform their role safely	Critical	5
Customer Experience is significantly degraded for majority of customers but not complete loss of service	Financial Impact - $5M -$30m	Non-compliant with internal Corporate safety, security policies	Significant impact to employees; work arounds require excessive time and additional resources	Major	4
Customer Experience degradation is minor for all customers	Financial Impact - $1M-$5M	Non-compliant with other internal Corporate policies (non-safety , non-security related)	Moderate impact to employees; work arounds require some increase in time with same resources	Serious	3
Customer Experience degradation is minor for small group of customers	Financial Impact - $0.1M-$1M	Non-compliant with internal departmental policy	Minimum impact to employees; work around in place with minimum impact to time	Moderate	2
No impact to the Customer Experience	Financial Impact <$0.1M	No impact on compliance	Nuisance / inconvenience for employees but with no impact on time	Minor	1

RISK MATRIX				
5	10	15	20	25
4	8	12	16	20
3	6	9	12	15
2	4	6	8	10
1	2	3	4	5
1	2	3	4	5
Rare	Unlikely	Possible	Likely	Almost Certain

CONDITION

LEGEND

	Acceptability of Risk
High Risk	Requires Mitigation
Medium-High Risk	Considered for Mitigation
Moderate Risk	Acceptable
Low Risk	Acceptable

	Support	Reliability	Vendor contract	Fit for Purpose
Rare	Expertise is readily available from authorized support sources to meet the service level targets for the business	Service has a high reliability rate with minimal downtime ; Operating as designed.	Licensing is compliant; versions are up to date to comply with vendor support requirements	Features, functionality, performance meets business expectations and requirements and is suitable to meet 5 yr technology road map requirements
Unlikely	Local resources readily available to source as needed; skills training available	Small number of failures reported.Minimal downtime	Licensing is compliant; Current service will be considered "end of life" in 3 years	Features, functionality, performance will not meet the business requirements planned in the next 4 years
Possible	Resourcing options available within North America at a premium cost.	Increase in number of failures reported over previous year; downtime hours impacting business operations.	Licensing is compliant; Current service will be considered "end of life" in 2 years;	Features, functionality, performance will not meet the business requirements planned within the next 3 years
Likely	No resource options within North America. limited availability outside of North America at premium cost	Material number of failures reported. Replacement parts difficult to source	Licensing is compliant; Current service will be considered "end of life" in 1 year	Features, functionality, performance will not meet the business requirements planned within the next 2 years
Almost Certain	Minimal to no options for resources that can provide support; training not available	Diagnostics predicting eminent hardware failure ; Priority software defects that vendor is not able to correct and no acceptable work around is available; hardware replacement parts cannot be sourced	Non- compliance with licensing requirements; Service is considered "end of life" by the vendor	Features, functionality, performance will not meet the business requirements planned within the next year

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General Plant

Projects under General Plant primarily involve information technology, communications and facilities initiatives. With the exception of IT which is ranked according to the matrix above, these other areas are too diverse to develop a comparable and useful ranking system across the groups, and therefore the determination of whether a project will proceed is based upon technical justifications, or economic benefit.

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6.3 Economic Analysis

6.3.1 Economic Analysis Model

The Economic Analysis Model (EAM) is an electronic spreadsheet which calculates and compares the revenue requirement by comparing alternatives to complete the project and avoided costs.

With respect to alternatives to completing the project, all else being equal, the alternative with the lowest discounted revenue requirement will be the preferred alternative. A cash flow analysis determining net present value (NPV) of the alternative cash flows is also incorporated into the EAM to further evaluate the economics of the project.

The following are typical inputs into the model:

- Capital investment profile
- Operating cash flows, including avoided costs

The model calculates the following:

- Revenue requirement
- Income tax associated with the capital expenditures
- Discounted net cash flow at the after-tax weighted average cost of capital (WACC)
- Net present value (NPV), Internal Rate of Return (IRR) and discounted payback period for each alternative

Each year an updated version of the model is provided to users with current tax rates, depreciation rates and WACC.

With respect to avoided costs, avoided costs are calculated using probabilities of failure, unit capacity factors, avoided maintenance costs, and avoided replacement energy costs. Capacity factors and avoided replacement energy costs are forecasted for five years, beginning in the year of project construction. If the avoided costs outweigh the capital costs of the project, the project is considered economic. The timeframe in which the benefit of the project equals the avoided costs is considered the “pay-back period”. NS Power will use an estimate of inflation as an escalator for year six (6) onward to determine future year avoided replacement energy costs.

On an annual basis, NS Power will compare its estimated inflation escalator to fuel forecasts for years 6 onward. If results materially vary, the continued use of inflation as an escalator will be more closely examined and discussed with stakeholders.

The benefits of the model are that it is relatively simple to use, promotes consistency of

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capital analysis across the organization and provides immediate information regarding the economics of alternatives. The model does not allow monthly cash flow entry. In this regard, where the results of alternatives are close, further review may be required.

Sensitivity analyses are incorporated into the model as adjustable variances for capital spend, avoided expenses, and timing of the project. These are adjustable to further test whether reasonable variances in those categories affect the rankings and therefore preference of alternatives.

With respect to various alternatives considered within an EAM, project developers will endeavour to provide realistic alternatives, and clarity on what is included in the costs comprising each alternative. Additional clarifying notes, if necessary, can be written onto the "Notes/Comments" section on the first page/tab of the EAM.

Administrative Overhead (AO) - Project capital cost and the revenue requirement analysis include Administrative Overhead (AO). While it is understood that costs included in NS Power's eligible expenses used to determine the AO rate are largely fixed, NS Power will examine further those projects where elimination of the AO credit from the revenue requirement analysis could affect the recommended alternative for economically justified projects. Where this occurs, NS Power will examine the effect of the AO amount more closely to determine the level of reduction to the AO credit which would change the recommended project, and based on this, provide appropriate comment on this in the Capital Item justification.

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6.3.2 Revenue Requirement Directive in Annual Capital Expenditure Plan

In the UARB's 2011 ACE Plan decision, the Board provided the following directive:

> In future ACE Plan applications, NSPI is directed to make an approximate calculation of how the Plan will affect revenue requirements.

Beginning in the 2012 ACE Plan NS Power has provided the overall approximate impact of the ACE Plan on revenue requirement. Beginning in the 2017 ACE Plan and pursuant to the 2016 ACE Plan Terms of Consensus, NS Power also provides a version of the overall revenue requirement table based on stakeholder assumptions and calculation methodology.

The underlying principle in calculating NS Power's revenue requirement table and impact is that capital expenditures that equal NS Power's depreciation expense do not change the customer revenue requirement. The premise is that rate base is not growing or declining if capital expenditures equal the rate of depreciation. To the extent depreciation expense equals capital expenditures in a given year, there is minimal effect on rate base or associated revenue requirement and therefore it is excluded from the calculation.

The revenue requirement impact considers the following inputs:

- Capital expenditures compared to forecasted depreciation expense annually.
- Administrative overhead credit based on proportion of capital expenditures in excess of depreciation expense in each year.
- Depreciation expense of assets added during the examined timeframe based on the proportion of capital expenditures in excess of depreciation expense of all assets in each year.
- Incremental interest based on the cost of debt multiplied by the portion of debt to total capital of the incremental rate base
- AFUDC based on the proportion of capital expenditures in excess of depreciation expense of all assets in each year.
- Income taxes based on the resultant effects and prorated Capital Cost Allowance for tax purposes.
- Net earnings based on the rate of return multiplied by the portion of equity to total capital of the incremental rate base.

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- Additional fixed cost recovery received from customer growth achieved through capital investment to serve these customers.

Depreciation expense and additional fixed cost recoveries are delineated in the overall revenue requirement calculation presented in the ACE Plan.

An important consideration is that this method does not address the revenue requirement impact should the capital projects not be completed. This includes avoided costs such as increased fuel costs, increased repair costs, and other risks or implications. The Economic Analysis Model used to decide whether an economically justified capital project is the best option for customers includes estimates of the avoided expenses, but these are not included in this revenue requirement calculation. Similarly, any resulting operating savings associated with a capital project are not incorporated. The revenue requirement calculation examines solely the incremental effects with rate base.

To expand on the methodology for revenue requirement impact described above, a separate table examining the impact on revenue requirement of economically justified (i.e. discretionary) projects is provided. The table presents the effect on revenue requirement of the project alternatives compared to the recommended options for the period presented in the ACE Plan. The project alternative revenue requirements are totaled to demonstrate the effect on annual revenue requirement of selecting other than the recommended alternative.

6.3.3 Total Cost of Ownership

In the UARB's 2022 ACE Plan decision, the Board provided the following directive:

> [T]he Board directs NS Power to use a TCO for IT projects over $1 million when an EAM is not provided, whether or not an alternative is available.

Total cost of ownership (TCO) is the cost of a new or upgraded capital asset plus all capital costs and operating expenses over its expected useful life. It accounts for all the capital and operating costs, including the upfront capital costs. In addition to providing a comprehensive understanding of the total cost of a capital investment over the course of its useful life, a TCO is also a useful tool for comparing capital investment options to determine the best value for money.

The TCO timeframe should match that of the expected useful life of the IT software or hardware. This allows for the flexibility to select an appropriate timeframe for a TCO analysis that is in keeping with the useful life of an investment rather than a prescribed timeline.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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7.0 Capital Planning Financial Criteria & Policies

- NS Power will be responsible for creating financial criteria for the Company;
- Accountability to develop and maintain the general and function-specific justification criteria resides in identified areas of NS Power;
- Capital planning, as a function, is distributed throughout NS Power, but is centrally managed. The respective functional areas of NS Power are accountable for developing, analysing and documenting projects and submitting all items to the Capital Planning group for review and approval;
- Accounting policies and procedures will be presented to the UARB for their approval prior to implementation. These policies and criteria are presented to the Board for approval through a separate proceeding, or can be incorporated within a proceeding, such as the Annual Capital Expenditure Plan.

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8.0 Financial Parameters

The capital program is financed through a combination of debt and equity. The weighted average cost of capital (WACC) is the average of the costs of these sources of financing, each of which is weighted by its respective use to fund the activities of NS Power. The weighted average calculation identifies the cost NS Power has to pay for every dollar it finances. WACC is used to calculate Allowance for Funds Used During Construction (AFUDC) applied to eligible capital projects. The WACC used by NS Power to calculate AFUDC will be the WACC most recently approved by the UARB. NS Power applies for approval of an AFUDC rate annually through a separate proceeding.

In making investments in capital projects, NS Power must be aware of a number of financial factors which are important in economic analysis:

- Cost of capital
- Depreciation
- Inflation
- Taxes
- Competition for investment capital in capital markets
- Investment risk

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9.0 Economic Analysis Of Alternatives

The guiding principle of economic analysis is to seek the most economic alternative based on establishing which alternative, among a number of alternatives that satisfy basic requirements, yields the best value for customers and NS Power. Alternatives, where applicable, must be reviewed prior to initiating a capital item.

The essentials of conducting an economic analysis of alternatives may include, when appropriate:

- Analysis methodology
- Financial parameters
- Cost components for analysis
- Analysis period
- Calculating the present worth
- Sensitivity analysis

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10.0 NS Power Capital: Types of Capital Applications Submitted for UARB Approval

- Capital projects submitted to the Board in the Annual Capital Expenditure Plan (ACE).
- Capital projects identified in the ACE Plan requiring subsequent submission to the Board.
- Capital projects included in the ACE Plan, but for which the Board has withheld approval in the ACE Decision; (typically requires a filing by NS Power of additional supporting information, in a separate, or revised capital application).
- Unforeseen and Unbudgeted (U&U) capital projects. These projects are not included in the ACE Plan and are filed separately for Board approval.
- Planned and Advanced (P&A) capital projects. These projects are not included in the ACE Plan and are filed separately for Board approval.
- Authority to Overspend (ATO) applications. These applications represent request for UARB approval of over-expenditure on a capital project or routine.
- Scope Change applications. These applications represent request for UARB approval of scope changes within a previously UARB approved capital project. This is independent of any variances in costs.
- Final Cost (FIN) applications: These applications are required for UARB approval if final costs of the project are over or under the specified spend thresholds. They consist of final cost details and variance analysis.

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11.0 Requirements for UARB Approval

11.1 General Requirements

NS Power is a public utility, subject to the provisions of the Public Utilities Act (the Act). NS Power is subject to general supervisory oversight of the UARB. Section 35 and Section 35AA (effective October 30, 2019) of the Act provide the following:

> 35 No public utility shall proceed with any new construction, improvements or betterments in or extensions or additions to its property used or useful in furnishing, rendering or supplying any service which requires the expenditure of more than two hundred and fifty thousand dollars without first securing the approval thereof by the Board.
>
> 35AA (1) In this Section, "large-scale public utility" means a public utility with an annual revenue of one hundred million dollars or more.
>
> (2) A large-scale public utility is not required to secure the approval of the Board under Section 35 for new construction, improvements or betterments in or extensions or additions to its property used or useful in furnishing, rendering or supplying any service that requires the expenditure of one million dollars or less.

The Board may approve, or disallow capital projects requested by NS Power. The Board's approval may be in the amount applied for by NS Power or another amount the Board considers appropriate. The form of Board review is determined by the Board and may involve direct review by the Board, its staff and consultants and/or a public hearing, either oral or written.

NS Power retains the discretion to defer or cancel capital projects submitted and/ or approved by the Board based on condition reassessment and reprioritization in accordance with engineering, business judgment and resource availability. Any projects cancelled or deferred are reported in the Quarterly Capital Reports.

11.2 Capital Application Requirements

Supporting documentation is provided with each capital work order application. The following information will be filed with each capital application in the project description, as relevant:

- Project Start Date
- Project In Service Date
- Project Final Cost Date
- Utility Function
- Forecast Amount
- Projects Estimated Useful Life

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- Depreciation Class

Related Projects approved or having taken place in the past 2 years, current year or anticipated for the next 2 years including the projects' estimated costs. When multiple projects relate to the same asset, or initiative they should be grouped as a package.

Project Description

Justification Criteria Including:

- Sub Criteria (when applicable)
- Description of why the project is being undertaken (i.e. Why do this project?)
- Description of why the project is necessary at the time proposed (i.e. Why do this project now?)
- Description of why the project will be carried out in the manner proposed (i.e. Why do this project this way?)
- Whether the work will be undertaken by an affiliate and reason for affiliate involvement

Summary of Related Capital Items

A list of related capital projects that have been or are scheduled to be completed within +/- 2 years of the submitted project will be included in capital applications.

A project can be considered related if it meets the following parameters:

Steam/Gas Turbine – Work completed on the same asset (turbine, boiler, etc.) and on the same unit (Lingan Unit #3, for example).

Hydro – Work completed on the same generating unit and dam structures, but not necessarily the same asset.

Wind – Work completed on the same Wind Farm site.

Transmission & Distribution – Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line).

General Plant – Work completed on the same asset (application, building, etc.).

Cost Support - This may include but is not limited to:

- Supplier quotes, or estimates
- Significant contract terms & conditions
- Management's best estimate based on previous experience or related projects

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Additional Information required to justify the project - This may include but is not limited to:

- Engineering/condition assessment reports
- Independent consultant reports
- Planning studies
- Business cases

Cost Benefit Analysis - This may include but is not limited to:

- The Economic Analysis Model; including inputs, assumptions, and results for all alternatives
- The Levelized Cost Model; including inputs, assumptions, and results for all alternatives
- Production Costing Modelling Results
- NS Power procurement documentation and recommendations; (i.e. Requests for Expressions of Interest and Requests for Proposals)

Project Due Diligence Summaries

Industry Information

Real Estate Information - This may include but is not limited to:

- Lease agreements
- Property evaluations and assessments

NS Power Performance Data - This may include but is not limited to:

- Load statistics
- Outage performance data
- Annual maintenance schedules
- Historical results for multi-year projects
- Internal NS Power reviews
- Operating performance indicators

Technical Details - This may include but is not limited to:

- Substation drawings
- Line drawings
- System Impact Studies
- Generation Interconnection Agreement

Stakeholder Information - This may include but is not limited to:

- Government legislation

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- Letters of project support
- Stakeholder engagement communication

11.3 Capital Costs Incurred Prior to Application

NS Power strives to submit all capital applications to the UARB for review and approval on a timely basis. Capital costs incurred prior to application submission will be subject to the criteria noted below with respect to their inclusion into rate base.

Preliminary Engineering Projects

Each quarter, any spend above $1,000,000 associated with a preliminary engineering project that has been inactive (i.e. no internal or external engineering or scoping work, exceeding $10,000, being carried out within the last 12 month period) will be removed from rate base until such time as the preliminary engineering becomes active again or these costs are submitted for approval to the UARB.

Under $1,000,000 Projects Subsequently Exceeding $1,000,000

Projects originally budgeted at less than $1,000,000, but subsequently exceeding that threshold during project execution, must be filed with the UARB for approval no later than within six months of the project exceeding $1,000,000. Any projects that do not get filed within this timeframe will have all costs in excess of $1,000,000 removed from rate base in the quarter after the six month timeframe until these costs are submitted for approval to the UARB.

Capital Projects in ATO Position

If a previously approved capital project exceeds the allowable variance of the greater of 5% or $250,000 and is not filed within six months of exceeding the approved amount, then the costs in excess of Board approval will be removed from rate base each quarter until these costs are approved by the UARB.

Unapproved Plant in Service Spending

Any capital item with unapproved plant in service above $1,000,000 that does not fall under any of the above categories, and where a capital work order has not been filed with the Board within 6 months of the project's completion, the spend to date on that project in excess of $1,000,000 will be excluded from rate base each quarter until such time as the work order is filed.

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12.0 Authorization to Overspend (ATO) Requirements

12.1 Individual Capital Item ATO

Approval to Overspend (ATO) applications are intended to request Board approval prior to incurring additional expenditures above the approved amount. Individual capital items (non-routine) that are tracking final costs with a variance of more than the greater of 5% or $250,000 must be submitted as ATO applications, within 6 months, if NS Power intends to include costs in excess of Board approval in its regulated rate base.

The reporting included with the Quarterly submission of capital project applications will provide the budget, forecast and actual financial details in a one line format for all projects. Those projects that are tracking final costs with a variance of more than the greater of 5% or $250,000 will be specifically identified.

The following documentation shall be filed with the Board in an individual capital item ATO application:

- Updated UARB approval sheet reflecting the revised project amount;
- Revised Capital Item Description Page reflecting the revised project amount;
- Cost support for the ATO request; and
- Updated economic analysis and / or production costing modelling results (if applicable).

12.2 Individual Capital Item Scope Change

Scope Change applications are intended to request Board approval prior to proceeding with a change in scope as compared to the previously Board approved scope. Scope Change applications may experience cost variances from the original application, but are submitted regardless of whether the thresholds for ATO and FIN applications have been exceeded. In the event a project has exceeding the ATO and FIN cost thresholds and has also experienced a scope change, the project will be submitted as a combined ATO or FIN and Scope Change application.

The following documentation shall be filed with the Board in an individual capital item Scope Change application:

- Updated UARB approval sheet reflecting the revised project amount if applicable;
- Revised Capital Item Description Page reflecting the revised scope change;
- Cost support for the ATO request (if applicable); and

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- Updated economic analysis and / or production costing modelling results (if applicable).

12.3 Routine Capital ATO

Routine capital ATOs are based on the annual budget of individual sub-routines noted in the preceding ACE Plan.

Those sub-routines with variances compared to the annual budget of more than the greater of 5% or $250,000 will require submission to the UARB for review and approval in the first half of the following year.

The following documentation shall be filed with the Board in a sub-routine capital ATO application:

- UARB approval sheet including the sub-routines subject to overspend, the revised sub-routine amount, variance amounts, and detailed variance explanations for each in the comments section.

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13.0 Final Cost Application (FIN) Requirements

Individual capital item projects that have realized a scope change or have final costs with a variance of more than the greater of +/-5% or +/-$250,000 will require that a final cost application be submitted to the Board for approval.

Projects not falling within this threshold may require final cost applications as requested by the UARB.

The information provided in these submissions includes:

- Updated UARB approval sheet reflecting the Final Cost amount;
- Revised Capital Item Description Page reflecting the Final Cost of the project;
- Line by line project account variances explanations will be provided for those accounts with material variances; and
- Project scope variances.

All projects should be final costed within six months of their in-service date. Exceptions to this requirement will be required on occasion. A final cost submission may be delayed due to certain circumstances or unique projects. Circumstances may include not receiving final vendor invoicing in a timely fashion. Unique projects may include projects for which in-service dates are well in advance of project completion. In all cases where final costing capital work orders are submitted past six months after their in-service, justifications for the delay will be provided.

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14.0 Retirement of Capital Assets

NS Power retires capital assets for various reasons, including:

Normal Wear and Tear

This is referred to as normal deterioration of physical plant caused by use over time and usually occurs because of the physical deterioration of the asset. This type of retirement usually causes an asset to be scrapped.

Inadequacy

This usually occurs because of such items as customer safety, employee safety, public safety, increased customer demand.

The asset can no longer be used safely or cannot supply the customers adequately. The asset is retired but could be reused in another location.

Technical and Economic Obsolescence

The asset is technically obsolete or becomes redundant and no longer economically supplies customers' needs. The asset is retired but could be reused in another location.

Public Authority Requirements

The asset is required to be removed and or replaced for some of the following reasons:

- Environmental regulations (e.g. PCBs)
- Regulatory requirements (e.g. meter replacement)
- Highway relocations

The asset is retired but could be reused in another location.

Customer Requirements

The asset currently serving the customer does not meet customer requirements in a manner other than adequacy and efficiency of supply (e.g. customer requests underground service).

The customer usually pays for any of these requests but the assets must be retired. However they could be reused elsewhere.

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Procedures

When capital assets reach the end of their useful life and are no longer able to contribute to the service of customers, they must be retired from the Plant in Service records at their original cost. In doing so, they are removed from rate base.

For retirements of property, plant and equipment other than land and entire production plants, the original cost plus any costs of removal less salvage proceeds is charged to accumulated depreciation, with no immediate gain or loss recognized.

Gains or losses on capital assets, with the exception of land, are deferred and depreciated over the remaining life of the assets, in accordance with depreciation rate filings with the Nova Scotia Utility and Review Board.

The only exception to this policy concerns the sale of land, in which the resulting gain or loss is recognized immediately.

In those cases where the disposal of land requires expenditures to address environmental issues, then this transaction will be viewed on its own merit, as per approved financial policies.

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15.0 Routine Expenditures

15.1 Foreword

NS Power's Routine Program (the Program) is organized and managed through a subset of capital items (Routines) which are provided below. The Program provides for recurring annual allocations of funds for high volume, repetitive, like-for-like capital replacements, enhancements, or additions that are expected to continue into the foreseeable future.

The Program is held to the same standards as individual ACE Plan projects with regards to compliance with Capital Expenditure Justification Criteria and NS Power's Financial Policies and Procedures.

On an annual basis NS Power requests UARB approval for the Program and its component Routines through NS Power's ACE Plan. Within the approval request further context and justification is provided to support the annual funding levels of the Routines. This information includes specific project budget details, historical trending and year over year variances.

15.2 Definition

Routines include recurring annual capital expenditures for:

- Replacement of worn out or technologically deficient stand-alone equipment.
- Additions/improvements to existing capital assets to raise or improve productivity levels and asset value.
- Additions to existing equipment base resulting from system growth.
- Addition of customers to the system.

15.3 Unit Cost Materiality Limits

The threshold for capitalizing smaller asset purchases is to be consistent with the materiality limits contained in the financial policies. Expenditures for amounts less than the stated capitalization limits should be charged to operations as they are incurred, regardless of the volume purchased.

Exceptions:

Where smaller components are implicit within the scope of a capital project they will be capitalized as part of the overall project.

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IT Infrastructure:

NS Power's computer platforms are made up of the following components:

- Keyboards
- Monitors
- Docking stations
- Peripheral communication devices
- Desktop and laptop computers
- Software
- Licenses
- Servers
- Networks
- Data Storage

Each of these assets is integral to the operation of the computer systems which allow employees to perform their daily work functions. NS Power's annual IT capital investment allows for the periodic refresh of certain components to ensure that each platform is functioning at its intended potential. As these purchases are included in and required to ensure the adequate performance of each employee's computer system, the investments will be capitalized.

15.4 Routine Classification

Routines are classified into four functional categories:

- Generation
- Transmission
- Distribution
- General Plant

The Routines included in the Program are as follows:

Generation Routines

Generation Equipment Replacements
Generation Other Hydro
Generation Other Thermal

Transmission Routines

Transmission Substation Replacements, Additions, Modifications
Primary Equipment Spares
Protection Modification & Replacement
Transmission Line Replacements, Additions, Modifications

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Distributions Routines

Meters
Distribution Upgrades and Replacement
New Customers
Joint Use
Right-of-Way Widening

General Plant Routines

Work Vehicles
Tools and Test Equipment
Telecommunications
Computing Asset Management
Property Improvements and Furniture
Other

15.5 Approval

Routines are provided for Board approval on an Annual basis through the ACE Plan. As part of the ACE Plan proceeding, stakeholders are provided the opportunity to evaluate each Routine. If a new Routine is required, NS Power will file for Board approval of the Routine prior to or by including it in the ACE Plan. If there are new projects added to an existing Routine, NS Power will identify the projects within the ACE Plan documentation.

Over-expenditure

Please refer to section 12.2.

Limits

All individual expenditures are tracked separately within the routine.

Routine Expenditure Reporting

The Board is kept apprised of the actuals incurred during a given year through the ACE Plan process and in the Q4 capital reports provided to the Board.

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16.0 Confidentiality

Where the above documentation packages provide confidential information (e.g. commercially sensitive information such as vendor quotes, cost estimates, and internal procurement recommendations; proprietary third party information such as consultant reports and standards documentation; and security sensitive information such as transmission one-line diagrams), NS Power will justify and request the Board, in accordance with Rule 12 of the Board's Rules, maintain portions of the capital filings as confidential. NS Power will minimize such requests for increased transparency and to support the Board's objective in issuing transparent, non-confidential, public decisions.

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17.0 Capital Expenditure Justification Criteria

17.1 Introduction - General Considerations

The following considerations are used to evaluate the economic justification for procurement and replacement of equipment, materials and services on the NS Power system.

- Examination of basic needs and alternatives (e.g. why is this required, why now, what other options are available, what are the consequences of doing nothing?).
- Examination of suitable technologies to provide an appropriate solution(s).
- Evaluation of alternative means of acquiring technologies including: design and build NS Power owned facilities and provide services using NS Power staff; rent or lease facilities and provide services using NS Power staff; rent or lease facilities and contract to others for services; and variants of the above as appropriate.
- The alternatives will be ranked using the most appropriate measure (e.g. Revenue Requirement or Net Present Value (NPV)), and the best alternative will be chosen (i.e. lowest Revenue Requirement or highest NPV or lowest Net Present Cost, etc.)
- Capability to meet industry norms for performance, such that NS Power's ability to provide its customers with the required levels of service are not compromised.
- Obsolescence and/or lack of support from facility, spare parts and service suppliers, such that NS Power incurs unacceptable risk of financial loss and/or liability.
- Ability to provide the lowest overall operating costs to NS Power.
- Required to ensure compliance with NPCC and, or NERC Reliability Standards.

The least cost option meeting the requirements and constraints specified above shall be selected.

17.1.1 Integrated Resource Plan

An Integrated Resource Plan (IRP) assesses various supply and demand scenarios to determine the best ways for NS Power to meet future requirements (including emission standards) in a cost-effective and reliable manner, while maintaining a minimum 20% capacity reserve margin above firm loads. The IRP is an important resource document used in the development of the capital plan.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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NS Power's IRP is:

- A strategic document;
- A planning document that helps NS Power and governing bodies create long-term sustainable plans based on in-depth analysis;
- A result of broad consultation with stakeholders;
- A roadmap that outlines the primary demand and supply options to be used by NS Power to meet future electricity and emission requirements;
- An analysis framework that integrates demand and supply options to meet future electricity requirements reliably and cost effectively in compliance with current and emerging operational and environmental constraints;
- A reference against which to assess demand and supply-side applications;
- A living document that will be updated as conditions change materially; and
- Developed using models that incorporate the best information available at the time of planning, as well as predictions about potential decisions that are subject to change as societal and technology priorities evolve.

NS Power's IRP:

- Is based on current information about basic assumptions;
- Sources include:
    - Recognized experts and consultants
    - UARB staff and UARB consultants
    - Proprietary information sources
    - Publicly available trends
    - Stakeholders / suppliers
    - NS Power's professional experience and judgment;
- Has a 25-year planning horizon;
- Provides ranges of realistic values based on current information.

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NS Power's IRP is not:

- An application for UARB approval of specific NS Power initiatives;
- A commitment by NS Power to undertake specific initiatives;
- A prohibition against specific third-party initiatives; or
- A review of regulatory or accounting treatment for NS Power assets or costs.

17.2 Innovation

Justification Criteria

Innovation capital projects are justified on the basis that there is a reasonable expectation that they will provide customer value in some or all of the areas of reducing upward pressure on revenue requirement, reliability and grid stability, government policy compliance, and customer experience, through the deployment of proven technologies in innovative ways. In addition, innovation capital investments may be justified on the basis that they are reasonably expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable.

Sub-Justification Criteria

Innovation capital projects may be justified under one or more of the following sub-criteria:

- reduce upward pressure on revenue requirement
- reliability and grid stability
- environmental and other compliance
- customer experience improvements

Reduce Upward Pressure on Revenue Requirement

Innovation capital projects justified under reducing upward pressure on revenue requirement must (1) be reasonably expected to reduce upward pressure on revenue requirement, based on known issues increasing pressure on revenue requirement, through the deployment of proven technologies in innovative ways; or (2) be reasonably expected to allow for testing before deploying at scale, provide valuable data and learning, or aid in the development of business cases where applicable, regarding the efficacy of innovation technology in reducing upward pressure on revenue requirement.

Reliability and Grid Stability

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Innovation capital projects justified under reliability and grid stability must (1) be reasonably expected to improve reliability and grid stability, based known issues affecting the same, through the deployment of proven technologies in innovative ways; or (2) be reasonably expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable, regarding the efficacy of innovation technology in improving the reliability of the system.

Environmental and Other Compliance

Innovation capital projects justified under environmental and other compliance must (1) be reasonably expected to support environmental or other compliance, based on environmental compliance or other legislation and regulation, through the deployment of proven technologies in innovative ways; or (2) be reasonably expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable, regarding the efficacy of innovation technology in complying with environmental or other policy.

Customer Experience

Innovation capital projects justified under customer experience must (1) be reasonably expected to improve the customer experience, based on either stated or predicted needs of customers, through the deployment of proven technologies in innovative ways; or (2) be reasonably expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable, regarding the efficacy of innovation technology in improving the customer experience.

17.3 Health & Safety

This criteria applies to capital projects undertaken to comply with applicable laws and accepted industrial practices, including but not restricted to:

- Nova Scotia Occupational Health and Safety Act and Regulations
- NS Power standards and work practices
- Orders issued by the N.S. Department of Labour, or Environment
- Accepted industrial practice or codes
- Exercise of due diligence

As well as applying to active NS Power sites, the Health and Safety criterion is applicable to temporarily or permanently decommissioned NS Power sites. Examples of such expenditures include the following:

- Demolition of physical plant to eliminate all liability

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- Alterations to a site or physical plant to render it secure against public intrusion in order to limit liability (e.g. signage, fencing, boarding of windows and doors, electrical isolation, etc.)

- Security devices to alarm intruders

- Alterations to a site or physical plant in preparation for sale or disposal

Projects where compliance with such requirements is the primary driver for the investment will utilize the Health and Safety justification criteria. There are often projects where other (discretionary) asset management criteria may be major drivers in addition to Safety improvements that will be accomplished through a capital upgrade. The intent is to code the project to its primary driver but judgment is often required to ensure consistency.

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17.4 Environment

As an industrial enterprise, NS Power is obligated to act in a manner which is respectful and protective of the environment in accordance with Company policy, environmental legislation and regulations and agreements with governments. Subsequent to appropriate analysis of its existing and proposed operations, NS Power may need to make capital expenditures to achieve the required environmental performance. NS Power is committed to an environmental ethic which supports environmental and economic sustainability.

The environmental justification criteria include the following:

Environmental Permit, License, Regulation Criteria

These criteria refer to the specific law(s) and the enabling legislation which is enacted to provide for processes, project approvals, environmental monitoring, and standards of performance.

Resulting from regulations, laws and legislation are instruments which require a certain level of environmental performance. They can significantly impact capital expenditures.

These instruments are:

- permits
- licenses
- regulations

NS Power's capital expenditure criteria will include justification based on the type of instrument placing the requirements.

Environmental Agreement, Guidelines, International Standards and Voluntary Action Criteria

These criteria respond to agreements between governments, government guidelines, international standards developed for various industrial sectors and voluntary action that bind the owner/operator to carry out its business in a certain way so as to meet agreed environmental performance.

These instruments may be more flexible than those described in section 1.0 above. However, there is usually little choice given the expectations of performance under international trade agreements. These agreements have provisions which can be used to punish and/or reward industries, economic sectors and countries based on environmental performance.

NS Power's capital expenditure criteria will include justification to make such an expenditure by reference to the specific instrument in question.

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17.5 Land and Right-Of-Way

NS Power needs to occupy and access land to enable the Company's operations. Land can be held as a fee simple title or through some other interest or type of right over land. Fee simple ownership is normally taken for facilities where permanent exclusive occupation is required, for example a thermal generating plant. Where these requirements are lessened in some way, NS Power can acquire interests which are less than the fee simple interest in land, including rights-of-way or easements for power lines, or utility corridors and leases or licences for the occupation of land.

Land and Rights owned by NS Power are managed according to their use, with the main distinction being between those in current use for company operations and those where there is no operational use. Sites without an operational use can be held to mitigate or protect adjoining operational uses, allow management of the remnants of past use, or to allow for future activities or to generate revenue.

The criteria governing NS Power land transactions are as follows:

Land Acquisition

Land is normally acquired as part of a capital project associated with the five year capital budget. Occasionally land that will satisfy the requirements of a future capital project that is beyond the five year capital budget will become available on the open market. In such instances the property may be acquired if no economically practical alternative property is available to satisfy the requirements of the future project in question.

Land Disposal

NS Power can dispose of, lease or grant rights over surplus land. Land associated with hydro projects is generally retained to protect the safety and usability of the whole system. Land to be disposed of will be investigated to ensure compliance with NS Power environmental criteria and provincial regulations.

Land and Building Disposal

A building, land or rights surplus to NS Power requirements and which can be sold will be sold with its associated lands assuming all environmental criteria have been met. If the land and building cannot be sold as one entity, then the building or facility will be removed or retired under NS Power retirement of capital asset criteria and, depending upon requirements, the land will be retained or sold.

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Abandoned Rights-of-Way

NS Power normally retains rights-of-way which are not in current use to allow for future use. If a right-of-way is determined to be surplus to NS Power requirements, then the right-of-way may be released, usually to the owner of the property over which the right-of-way exists.

17.6 Hydro, Wind and Biomass

The principles set out hereunder shall be used by NS Power in determining the methods used and timing of purchase and replacement of its hydro, wind and biomass production assets.

These production assets may be purchased, replaced, or modified for any of the following conditions:

- To eliminate conditions which, in the opinion of NS Power, constitute hazards to operating personnel or the general public.
- To meet NS Power's obligations to third parties or to conform with applicable laws and regulations - including Nova Scotia's Renewable Electricity Standards and Canadian Dam Safety Guidelines.
- To produce an economic benefit by reducing or minimizing operating costs, or improving generating equipment efficiency.
- To maintain reliability and quality of supply to the bulk power system.
- When the probability of failure is high enough that:
    - Making the proposed capital investment reduces the costs compared to continuing to repair the existing asset;
    - The estimated cost reduction is of significant magnitude to meet NS Power's financial criteria; and
    - The timing of investment is optimized to maximize customer net benefits.

For projects justified on the basis of economics, it must be demonstrated that the value of energy to the system is greater than the cost of the capital project in question or the next most cost effective renewable energy option to replace the renewable generation. The latter is required to ensure NS Power remains compliant with Nova Scotia's Renewable Energy Standards.

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17.7 Thermal

The principles set out hereunder shall be used by NS Power in determining the methods used and timing of purchase and replacement of its thermal production assets.

Equipment Replacement / Refurbishment

Capital expenditures to purchase, replace, or refurbish equipment must be justified by an engineering and economic evaluation which incorporates information from planned inspection/performance programs and industry standards. An economic analysis is carried out such that the least cost option meeting all the requirements and constraints specified shall be selected.

Thermal production assets shall be purchased, replaced, or modified when the probability of failure is high enough that:

- Making the proposed capital investment reduces the costs compared to continuing to repair the existing asset;
- The estimated cost reduction is of significant magnitude to meet NS Power's financial criteria; and
- The timing of investment is optimized to maximize customer net benefits.

Heat Rate

For capital expenditures resulting in Unit heat rate improvements, an annual cost saving is calculated using the system dispatch production models (i.e. production costing model) (for major improvements) or calculated on a BTU/kWh basis using current production forecasts and current cost of fuel forecast (for minor improvements < 1% improvement in heat rate).

Capacity

For capital expenditures that result in an increase in net Unit capacity, the value of a kW is calculated using system planning models.

Labour

Impacts on present or future labour requirements are calculated on an annual savings/cost basis taking overtime and fringe benefits into account.

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Forced Outage Rate

Unplanned outages result in replacement generation, often at a higher cost than the existing generation. These costs are estimated using the probabilistic production model and incorporated into the Economic Analysis Model.

17.8 System Design

The Nova Scotia Power Inc. transmission system is divided into several classifications, each of which is governed by different design criteria.

NS Power is a member of the Northeast Power Coordinating Council (NPCC). Those portions of the NS Power Bulk Power System, wherein single contingencies can potentially adversely affect the interconnected NPCC system, are designed and operated in accordance with NPCC Directory #1, Design and Operation of the Bulk Power System.

NS Power is required to follow the standards of the North American Electric Reliability Corporation (NERC). NERC is a non-government organization which regulates Bulk Power System users, owners, and operators through the adoption and enforcement of standards for fair, ethical, and efficient practices. NERC standards are filed with the UARB through a regulatory approval process where they become mandatory and enforceable in the province of Nova Scotia. NS Power designs its Bulk Electric System to meet the requirements of the in-force NERC standards. NS Power utilizes a set of criteria for its transmission system that combines protection performance specifications with system dynamics and steady state performance requirements. The NS Power Bulk Electric System is planned, designed, and operated in accordance with single contingency criteria.

NS Power System Design Criteria are applied for all other portions of the interconnected system.

NERC standards and NPCC criteria are continually evolving. NS Power system design practices are constantly updated to meet the requirements of new and evolving standards.

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17.9 Transmission Plant

Conditions for Purchase

Transmission plant may be upgraded, rerouted, or otherwise modified for any of the following conditions:

- To eliminate conditions which, in NS Power's opinion, constitute hazards to operating personnel or to the general public.
- To meet NS Power's obligation to third parties or to conform with the provisions of applicable laws and regulations.
- To reduce or minimize operating costs of the transmission system.
- To maintain reliability and quality of supply to the distribution bus.

Conditions for Replacement

Transmission plant shall be replaced, if still required to meet minimum industry standard system design requirements. Additional details pertaining to the conditions for replacement are provided in the NS Power Capital Planning & Capital Expenditure Justification Criteria Detailed Document.

17.10 Distribution System

NS Power's Distribution System connects the majority of NS Power's customers to the Transmission System. (Some of the larger customers are supplied directly from the transmission network.) As such the Distribution System criteria bridge the gap between the Transmission System and the customer's service entrance. The need for distribution projects is driven by the considerations provided below.

- Requirement to Serve
- Pole Strength Compliance with Standard CAN/CSA-C22.3 No. 1-10 - Overhead Systems
- Service Voltage Outside CSA Standard CAN3-C235-83 (C2010)
- Overloaded Equipment
- Deteriorated Conductor
- Outage Performance
- Distribution System Protection
- Prevention of Catastrophic Failure of Distribution Transformers/Capacitors
- Grounding Criteria

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- Joint Use Agreement
- Highway Relocation
- Radio Interference Voltage
- Voltage Unbalance
- Voltage Flicker Due to Motor Starting
- CATV Agreement

17.11 Pole Retreatment

The principles set out hereunder shall be used by NS Power in determining the methods used and the timing of retreatment of its transmission and distribution wood poles.

Conditions for Retreatment

Wood poles originally treated with pentachlorophenol and creosote preservatives may be retreated with approved wood preservatives to reinforce the preservative retention levels in the ground line area thereby maintaining acceptable toximetric thresholds necessary for protection against fungal and insect attack.

Criteria for Wood Pole Retreatment

NS Power undertakes on a line basis, retreatment of many species of wood poles that have been in service for 15 years or more to meet minimum industry standard requirements. Additional details pertaining to the conditions for retreatment are provided in the NS Power Capital Planning & Capital Expenditure Justification Criteria Detailed Document.

17.12 Metering Equipment

Conditions for Purchase

For revenue metering, NS Power purchases only those meters having Measurement Canada (MC) type approval. Meters are sealed by NS Power, or accredited verifier, to the Standard proclaimed in document S-E-02, "Specifications for Verification and Re-verification of Electricity Meters", before being placed in service. Meters are also brought in from active service on a periodic basis for re-verification according to this standard.

Meters being purchased at the present time for kWh measurement will be of the standard type, or have been determined to be the most economic choice when all factors related to metering cost have been considered. MC allows selective sampling of standard induction type meters both in verification and re-verification.

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Conditions for Replacement

Metering equipment may be replaced, upgraded or otherwise modified when meters fail the criteria specified in the Standard, or when a rate class for a given customer changes, requiring a meter with greater or lesser capability. Additional details pertaining to the conditions for replacement are provided in the NS Power Capital Planning & Capital Expenditure Justification Criteria Detailed Document.

17.13 Work Support Facilities

Building Facilities/Furniture

NS Power owns and operates buildings and associated systems, equipment and furniture to support the delivery of service to customers (i.e. other than that associated with generation facilities, the costs of which are included in the related function costs). These facilities are operated in a manner which provides the most suitable environment for employees to carry out their work in a safe and efficient manner and protects the asset and extends its original useful life.

Facilities may be constructed, replaced, upgraded, renovated, leased, retired or otherwise modified for any of the following purposes;

- To eliminate conditions which, in NS Power's opinion, constitute hazards to NS Power's personnel or to the general public;
- To meet NS Power's obligations to third parties or to conform with the provision of applicable laws and regulations there under;
- To protect facility assets by maintaining them in a reasonable operating condition;
- To comply with regulations and legislation.

The least cost option meeting all the requirements and constraints specified above shall generally be selected.

Telecontrol & Telecommunications

Telecontrol Facilities includes equipment which is used to provide supervisory control and data acquisition (SCADA), remote control, special protection systems and teleprotection.

Telecommunication Facilities includes broadband transport mediums such as: fibre optics, microwave radio, UHF and VHF radio, metallic-pair cable, power line carrier, and systems which employ these mediums to transfer voice and data communications from one location to another such as: telephone, mobile radio, telecontrol equipment, computer networks, video, etc.

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Telecontrol and telecommunications are essential for the protection and control of the Bulk Power System. They allow for remote monitoring and control of the power system through SCADA and provide for high speed protection of generation and transmission facilities through teleprotection and special protection systems (SPS). Telecontrol and telecommunications are also required to ensure compliance with Northeast Power Coordinating Council (NPCC) and the North American Electric Reliability Corporation (NERC) Reliability Standards. Telecontrol and telecommunication facilities are not used directly for the supply of electricity to NS Power customers. They are enabling technologies which help to satisfy NS Power's business requirements to serve its customers in the most economical, effective and safe manner possible. The need for the application of this technology is driven by the above requirements.

17.14 Information Technology Application and Hardware System

Information Technology (IT) is subject to rapid evolution, obsolescence, and evolving customer expectations. Accordingly, categories and justifications for IT capital investments vary, from mitigating risks associated with obsolescence to meeting customer needs and expectations. IT projects can be broadly justified under the following sub-criteria:

- Technical
- Economic
- Customer Experience

IT capital projects may be justified primarily under one of these sub-criteria or under a combination of them all. These categories and their justifications are expanded upon below.

Technical

Technical projects are driven by criticality and condition based risk assessments of in-service assets. They are most frequently associated with mitigating risks associated with obsolescence, security, and system performance to meet requirements of the utility to serve customers. Technical projects are ranked according to the ranking matrix and methodology outlined in Section 6.2.

Economic

Economic projects are driven by opportunities to operate in a more cost effective manner. Economics may also be associated with Technical, and Customer Experience projects.

Customer Experience

Customer experience projects are driven by either stated or predicted needs of customers, and are reasonably expected to provide improvements to their experience and interactions with NS Power.

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17.15 Vehicles

Nova Scotia Power requires vehicles for the effective delivery of its services. There are two broad classifications used for vehicle identification; transportation and work vehicles.

Vehicle Replacement Process

The first step in the review of any vehicle for potential replacement is that it meet the life cycle costing methodology initial screening criteria.

Vehicles proposed for replacement based on the screening criteria of vehicle age, kilometres and maintenance history are then subject to a mechanical inspection and analysis by the Fleet Services group.

The premise of vehicle replacement is to achieve the most economical decision based on life cycle costing, which includes predictive maintenance, age and kilometres.

NS Power follows the life cycle costing methodology to establish units that are a potential for replacement. Vehicle replacements are ranked and scheduled based on the overall benefits to all operating units.

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NOVA SCOTIA POWER INC. CAPITAL PLANNING & CAPITAL EXPENDITURE JUSTIFICATION CRITERIA
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1.0 Definitions

Annual Capital Expenditure (ACE) Plan: A document containing details regarding all of NS Power's capital projects planned for a given calendar year. The ACE Plan is submitted to the UARB every year.

Authorization to Overspend (ATO): A capital work order package for submission to the UARB should the project forecast final costs with a variance of more than the greater of 5% or $250,000.

Bulk Power System: The interconnected electrical systems within northeastern North America comprising generation and transmission facilities on which faults or disturbances can have a significant adverse impact outside of the local area.

Carry Over Project: A capital project that is approved and initiated in one calendar year, but the investment of capital carries over into the subsequent year(s).

Capital Cost: The cost required to complete a capital project.

Capital Cost Allowance: A yearly deduction of depreciation that can be claimed for income tax purposes on the cost of certain assets.

Capital Expenditure Justification Criteria (CEJC): The criteria contained in this manual, defining matters related to capital expenditures. The CEJC contains the criteria defining what, why and when a project qualifies as a capital project.

Capital Identification (CI) Number: The unique identification number associated with a capital project.

Capital Lead: Employee responsible for technical and financial justification of capital work from a particular area (e.g. generation), program (e.g. reliability), or function (e.g. system reinvestment).

Discounted Payback Period: This is a measure of economic value. It represents the number of years required to pay back the initial capital cost of a project. It measures the levered payback period.

Discretionary Project: Investments that are incremental to an essential capital investment and which are made solely on the basis of economics, and there is an acceptable "do-nothing" alternative. Discretionary projects may yield defined benefits that minimize the revenue requirements of NS Power.

Do Nothing Alternative: A "do nothing" alternative refers to the alternative to not proceed with a discretionary capital project with corresponding acceptable outcomes. Whereas discretionary projects are based solely on economics, they are not addressing safety, legal, reliability or technical scenarios, and therefore "doing nothing" results in little or no risk to NS Power's system.

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Economic Analysis Model (EAM): The standard software model used by NS Power to calculate the present value of revenue requirement and economic value of any project. The software takes capital costs, avoided costs, revenue, expenses and taxes into consideration to give a Net Present Value (NPV), internal rate of return (IRR), and discounted payback period.

Economically Justified Project: A capital project that is justified, in part, on economic benefits. The Economic Analysis Model (EAM) is used to derive the economic benefits of all economically justified projects. Economically justified projects may also be justified on other technical justifications.

Environmental Project: A capital project that is justified on the basis of environmental criteria. These criteria include operating permit approval, Environmental Act or regulation compliance, regulatory standards and industry standard compliance.

Essential Project: A capital addition or replacement which must be made to satisfy technical, legal, safety, regulatory or environmental directives.

Executive: A member of the NS Power Executive Team including General Managers, Vice Presidents, Executive Vice Presidents and the President and CEO.

Final Cost (FIN): A capital work order package for submission to the UARB should the project experience a scope change or if final costs result in a variance of more than the greater of +/- 5% or +/- $250,000. FIN capital work orders consist of final cost details and a variance analysis.

Individual Capital Item: Individual capital items, typically of a non-repetitive nature, and justified and budgeted separately from capital routines.

Integrated Resource Plan: A long-term planning process and framework within which the costs and benefits of both demand and supply side resources are evaluated to develop the least total cost mix of utility resource options.

Information Request (IR): A request from the Utility and Review Board (UARB), or other intervenors, for additional information pertaining to a capital project.

Internal Rate of Return (IRR): The discount rate used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake the project. As such, IRR can be used to rank prospective projects. Assuming all other factors are equal among the various projects, the project with the highest IRR would likely be considered the best and undertaken first.

Investment Review Team (IRT): The IRT is composed of a diverse group of Directors and Managers who offer expertise and experience from different functional areas within NS Power. The IRT manages NS Power's capital program in an integrated manner ensuring that projects are

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prioritized across NS Power. Investment initiatives are continuously monitored and the status of the capital program is communicated to NS Power's Leadership Team.

Leadership Team: Senior Managers, Directors and Executive of NS Power.

Planned and Advanced (P&A): A capital item that is planned (foreseen and budgeted) in future years but advanced for commencement and/or completion in the current year. They are not U&Us despite not being referenced in prior ACE Plans.

PowerPlan (software): The software that is used to manage all aspects of capital projects including project scope, justification, budget, approvals and actual project information. The software can be used to research information on past projects and forecast project activity into the future.

Production Costing Model: A system modelling tool which provides detailed forecasts of fleet dispatch and production costing, reflecting the increasing complexity of the system. Used in the calculation of replacement energy costs.

Routine Capital Item: A capital item containing a number of projects that are high volume, repetitive, like-for-like capital replacements, enhancements, or additions that are expected to continue into the foreseeable future.

Safety Project: A project that is justified on the basis of health and safety criteria. Some of these criteria include regulatory requirements, Nova Scotia Department of Labour orders, NS Power safe work methods/practices, revisions to industry standards, Joint Occupational Health and Safety Committee (JOHSC) actions and mitigating risk of potential health and safety incidents.

Special Protection System (SPS): A protection system designed to detect abnormal system conditions, and take corrective action other than the isolation of faulted elements. Such action may include changes in load, generation, or system configuration to maintain system stability, acceptable voltages or power flows. Automatic under-frequency load shedding as defined in the NPCC Emergency Operation Criteria A-3, is not considered a Special Protection System. Conventionally switched, locally controlled shunt devices are not Special Protection Systems.

Total Cost of Ownership (TCO): The upfront capital cost of a new or upgraded capital asset plus all capital costs and operating expenses over its expected useful life.

Unforeseen and Unbudgeted (U&U): A capital item that develops throughout the year, typically in response to discoveries made through routine inspections, maintenance, and/or unplanned failures, and was not included in prior ACE Plans or the current ACE Plan. Projects foreseen and budgeted for future years, but advanced for commencement and/or completion in the current year, are not U&Us despite not being referenced in prior ACE Plans (these are designated as P&A projects). A U&U is submitted because the capital item cannot wait until the next ACE Plan for approval.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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Utility and Review Board (UARB): Pursuant to the Public Utilities Act, the Nova Scotia Utility and Review Board ("NSUARB" or "Board") exercises general supervision over all electric utilities operating as public utilities within the Province.

Weighted Average Cost of Capital (WACC): The cost of capital (discount rate or interest rate) determined by the weighted average, at forecasted book value, of the cost of all financing sources (debt, corporate bonds, equity) in the capital structure of NS Power. The weighted average cost of capital (WACC) is determined by the Finance Team and incorporated into the Economic Analysis Model (EAM) in order to determine the Net Present Value (NPV) and discounted payback of a capital project.

Acronyms

ACE	Annual Capital Expenditure
ACHI	Avoided Customer Hours of Interruption
AFUDC	Allowance for Funds Used During Construction
AO	Administrative Overhead
ASTM	American Society for Testing and Materials
ATO	Authorization to Overspend
CAIDI	Customer Average Interruption Duration Index
CCA	Capital Cost Allowance
CEJC	Capital Expenditure Justification Criteria
CI	Capital Item
CO	Carry Over
CSA	Canadian Standards Association
EAM	Economic Analysis Model
FIN	Final Cost
DEP	Distribution Engineering Practices
IR	Information Request
IRP	Integrated Resource Plan
IRR	Internal Rate of Return
IRT	Investment Review Team
MC	Measurement Canada
NERC	North American Electric Reliability Corporation
NPCC	Northeast Power Coordinating Council
NPV	Net Present Value
NS Power	Nova Scotia Power Incorporated, “the Company”
P&A	Planned and Advanced
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SPS	Special Protection System
UARB	Nova Scotia Utility and Review Board, “UARB” or “Board”

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U&U	Unforeseen and Unbudgeted
WACC	Weighted Average Cost of Capital

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2.0 Introduction

In its 1995 ACE Plan Decision, the Board provided the following:

> By an Order dated January 5, 1995 the Board directed that Nova Scotia Power Inc. (NS Power, the Utility, the Company) file evidence relating to its 1995 Annual Capital Expenditure (ACE) Plan by January 12, 1995, and set March 6, 1995 as the commencement date for a hearing.
>
> In an exchange of correspondence between the Company and the Board in early 1994, an understanding was reached that NS Power would make a yearly presentation of its Annual Capital Expenditure Plan and that NS Power would ensure work orders for projects less than $1 million meet Board approved technical and financial capital expenditure justification criteria. The Board indicated that it would undertake periodic audits on samples of work orders to ensure that such criteria had been satisfied.[1]

Those technical and financial justification criteria are contained in this document, the Capital Expenditure Justification Criteria (CEJC).

NS Power is a public utility, subject to the provisions of the Public Utilities Act (the Act). NS Power is subject to general supervisory oversight of the UARB. Prior to October 30, 2019, each capital item in excess of $250,000 required approval by the UARB. Section 35 of the Act was amended on that date to raise this limit to $1,000,000 for "large scale public utilities", which is defined under the Act as a public utility with an annual revenue of one hundred million dollars or more. Accordingly, NS Power can carry-out capital work on projects of $1,000,000 or less in value without UARB approval. The UARB can perform periodic audits to ensure that the criteria are being properly applied. Projects found to be inappropriately justified or imprudent can be excluded from NS Power's rate base.

[1] 1995 ACE Plan UARB Decision (March 31, 1995) NS Power-P-866-DEC.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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3.0 Administration

This document will be maintained by NS Power. Pursuant to the Board's 2016 ACE Plan Decision directives, revisions to the CEJC will be reviewed by stakeholders prior to filing with the UARB. The CEJC will be filed with the Board, with revisions noted for the Board's information, as required. Revisions to this document will be accompanied by a brief review of the updates or changes. A corresponding Summary CEJC will be provided for the Board's approval.

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4.0 NS Power Commitment

NS Power will manage its capital expenditures in accordance with the principles and guidelines contained within this document. The CEJC is applicable during all phases of the capital approval process. This begins during the development and submittal of the ACE Plan and continues until the project is complete and receives final cost approval.

NS Power is committed to:

- Delivering effective and efficient service to NS Power customers;
- Providing the assurance that NS Power is using sound and consistent economic, financial and technical criteria to justify capital expenditures;
- Effectively responding to changing environmental, operational, technical, safety and financial conditions in compliance with legislative and regulatory requirements; and
- Providing complete and timely capital filings for Board consideration and approval.

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5.0 Objectives

The objectives of the CEJC are as follows:

- To provide assurance that NS Power is using consistent economic, financial and technical criteria to justify all capital expenditures.
- To provide assurance that the capital expenditures result in the maximum benefit for customers and minimum impact to rates.
- To communicate NS Power's justification requirements to all personnel involved in the execution and approval of capital projects in a clear and structured manner.
- To provide the assurance NS Power has appropriate levels of accountability regarding the oversight of the capital processes.
- To ensure that the justification criteria reflect a multi-disciplined approach to justifying capital expenditures using current financial and technical standards.
- To support the use of consistent practices within NS Power.

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6.0 Overview of Capital Planning

6.1 Summary of Capital Planning, Budgeting & Execution Process

NS Power's capital program is overseen by the Company's Investment Review Team (IRT). The IRT is chaired by a senior NS Power employee in the capital planning business function, and the team is composed of a diverse group of Directors and Managers who offer expertise and experience from different functional areas within NS Power. The IRT manages NS Power's capital program in an integrated manner ensuring that projects are prioritized across the Company, investment initiatives are continuously monitored and the status of the capital program is communicated to NS Power's Leadership Team.

The initial phase in the preparation of the ACE Plan is compiling a project list to collect all pertinent information about the capital projects that may be included in the ACE Plan. This requires coordination between the generation, transmission, distribution and corporate groups, Asset Management, Finance and Regulatory Affairs.

In Generation, Transmission, Distribution, and Information Technology (IT), the process begins at the start of each year with the functional groups compiling information about projects that require consideration for the following year.

As this information is gathered, each functional group will input information into NS Power's capital management system, PowerPlan. The addition of a project to PowerPlan requires the inclusion of a project title, project description, project justification, capital cost spending profile and identification of primary and secondary justification criteria (ranking category).

Projects identified within PowerPlan are reviewed by capital planning and division management for each function. There is a standard ranking methodology for Generation, Transmission, Distribution, and Information Technology, which is described in further detail below.

Generation, Transmission and Distribution projects are broadly ranked using the following criteria:

- Health and Safety: Regulatory requirements, Operating Permits, Protection of Equipment and Personnel Safety, and JOHSC actions.
- Environment/Regulatory Compliance: Renewable Energy Standards, Greenhouse Gas (GHG) Regulations, or Air Emission Regulations.
- Business Sustainability: SAIDI, SAIFI, CAIDI; unit reliability; system upgrade requirements; code requirements; NERC/NPCC Requirements, or economics (based on payback period, and revenue requirement); requirement to serve.

Technically justified IT projects are broadly ranked using the following criteria:

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- Customer: service impacts to customers as a result of technical failure
- Finance: financial impacts to the Company as a result of technical failure
- Compliance: safety, environmental, security, legal or regulatory requirements (e.g. NERC/CIP and NI-52 compliance)
- Operating Sustainability: ability for NS Power staff or contractor to perform critical functions of the business.

Each year, the capital program includes those projects which are essential for health and safety objectives, regulatory compliance, those which are required to provide service to a given area, and mitigate risks. Projects which serve to improve customer reliability are evaluated based on the probability factors related to performance targets (SAIDI, SAIFI, CAIDI). Economic initiatives are evaluated based on their economic and performance ranking. The capital program can be constrained by a number of factors including the ability to effectively execute the annual program with the available time and resources, the maintenance cycle of the generating facilities and company cash flow.

The NS Power Executive approval process involves a detailed review of the consolidated ACE Plan. Division management work with the executive team to address any comments or concerns which may arise from this review.

Following this review and approval, final changes to the capital plan are made and the ACE Plan is compiled for submission to the UARB. Included as part of this process is the identification of projects that are not ready for formal submission to the UARB for review and approval. These projects are noted on the Subsequent Submittal list in the ACE Plan. While these projects continue to form part of the total ACE Plan budget, submission to the UARB for review and approval is deferred until they are filed separately later in the year.

NS Power's capital program is intended to be dynamic and flexible in accordance with a complex business. Revisions may include scope changes, timing changes, costing updates, new project additions, etc.

6.2 Ranking Process

Generation, Transmission, Distribution, and Information Technology

Each Generation, Transmission, Distribution, and Information Technology capital project is ranked using the criteria provided in the matrices below. The ranking process is completed first in the early stages of project development and continues to be refined as the scope and estimated costs for the capital project are further defined. All rankings are reviewed by a centralized Investment Review Team to ensure the projects are justified and appropriate for inclusion in the ACE Plan.

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The scale of the rankings is detailed in the matrices below.

Criticality and Condition values are typically influenced by one predominant factor and ranked accordingly. However, other factors may also influence the ranking of a project. In the event that multiple factors are present for a project, individual rankings will be taken into consideration in determining the overall Criticality rankings. For example, Health and Safety considerations for a project may warrant a Criticality ranking of serious (3), while Environmental considerations for the same project may also independently warrant a Criticality ranking of serious (3); this project may therefore warrant a higher Criticality ranking due to multiple influencing factors.

The four colours of the ranking matrix are a visual representation of the likelihood of a capital project being completed. A project falling within the red rankings is considered a high priority and should be completed. Projects falling within the orange and yellow rankings represent projects that carry a higher risk than the projects in the green rankings. While the colours provide a visual illustration of risk, the ranking numbers are the focus of the ranking process.

A lower ranking suggests a lower level of risk and urgency, but not always a lower level of priority. Lower ranked projects that fall in the green, yellow or orange rankings may be completed in certain cases. For example, a project that does not carry a high enough ranking may be completed during a planned outage if the condition of the asset is expected to deteriorate such that action would be required prior to the next available outage.

Considerations of multiple influencing factors, all rankings applied to projects under the ranking methodology noted above, and the order of completion of projects ahead of others, are all subject to the evaluation and professional judgment of NS Power staff and third party industry experts.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria

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ASSET MANAGEMENT CRITICALITY & CONDITION RISK ALIGNMENT MATRIX

Criticality (Based on Consequence)				CRITICALTY VALUE	RISK MATRIX				
Health & Safety	Environment	Business Sustainability	Consequence						
• Regulatory requirement breached. •Critical safety incident requiring support from external resources •Fatality or Permanent Disability.	• Regulatory requirement breached. • Loss of generating station or facility operating permit. • Critical liquid, chemical or particulate release with off-site or off-facility impact.	Business Sustainability Criticality Ranking is informed through factors such as replacement energy costs, Regulatory Requirements, SAIFI, SAIDI, DAFOR, System Upgrade Requirements, Code Requirements and Project Economics (payback period, NPV, Revenue Requirement).	Critical	5	5	10	15	20	25
• Major safety incident leading to JOHSC actions and controllable by internal resources. • Lost time Injury	• Corporate environmental target exceedence. • Major reportable environmental incident with off-site or off-facility impact.		Major	4	4	8	12	16	20
• Serious safety incident leading to JOHSC actions and controllable by internal resources. • Recordable injury, >1 medical Aid	• Serious reportable environmental release causing license exceedance and off-site or off-facility impact.		Serious	3	3	6	9	12	15
• Moderate safety incident controllable by internal resources and no JOHSC actions required. • Recordable injury, < 1 Medical Aid	• Moderate reportable environmental release without license exceedance and internal impact only.		Moderate	2	2	4	6	8	10
• Minor safety incident controllable by internal resources and no JOHSC actions required • First Aid Injury	• Minor non-reportable environmental release with internal impact only and no license exceedance.		Minor	1	1	2	3	4	5
					1	2	3	4	5
					Rare	Unlikely	Possible	Likely	Almost Certain

CONDITION

LEGEND

	Acceptability of Risk
High Risk	Requires Mitigation
Medium-High Risk	Considered for Mitigation
Moderate Risk	Acceptable
Low Risk	Acceptable

Condition Description	
Rare 1	Failure or occurrence is rare (0-10%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate of less than 1 in 100 operating years.
Unlikely 2	Failure or occurrence is unlikely (11-25%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate of less than 1 in 75 operating years.
Possible 3	Failure or occurrence is possible (26-75%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate between 1 in 10 and 1 in 75 operating years.
Likely 4	Failure or occurrence is likely (76-90%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate between once per year and 1 in 10 operating years.
Almost Certain 5	Failure or occurrence is almost certain (91-100%). Available data, past experience and or subject matter expert input indicates an expected occurrence rate of greater than once per year.

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Nova Scotia POWER
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INFORMATION TECHNOLOGY ASSETS CRITICALITY & CONDITION RISK ALIGNMENT MATRIX

Business Criticality (Based on Consequence)					Criticality Value
Customer	Finance	Compliance	Operational Sustainability	Criticality	
Loss of a service for all customers	Financial Impact > $30m	Breach of compliance with any of safety, environmental, security, legal or regulatory requirement	Employees could not perform their role or an employee / contractor could not perform their role safely	Critical	5
Customer Experience is significantly degraded for majority of customers but not complete loss of service	Financial Impact - $5M -$30m	Non-compliant with internal Corporate safety, security policies	Significant impact to employees; work arounds require excessive time and additional resources	Major	4
Customer Experience degradation is minor for all customers	Financial Impact - $1M-$5M	Non-compliant with other internal Corporate policies (non-safety , non-security related)	Moderate impact to employees; work arounds require some increase in time with same resources	Serious	3
Customer Experience degradation is minor for small group of customers	Financial Impact - $0.1M-$1M	Non-compliant with internal departmental policy	Minimum impact to employees; work around in place with minimum impact to time	Moderate	2
No impact to the Customer Experience	Financial Impact <$0.1M	No impact on compliance	Nuisance / inconvenience for employees but with no impact on time	Minor	1

RISK MATRIX				
5	10	15	20	25
4	8	12	16	20
3	6	9	12	15
2	4	6	8	10
1	2	3	4	5
1	2	3	4	5
Rare	Unlikely	Possible	Likely	Almost Certain

CONDITION

LEGEND

	Acceptability of Risk
High Risk	Requires Mitigation
Medium-High Risk	Considered for Mitigation
Moderate Risk	Acceptable
Low Risk	Acceptable

	Support	Reliability	Vendor contract	Fit for Purpose
Rare	Expertise is readily available from authorized support sources to meet the service level targets for the business	Service has a high reliability rate with minimal downtime ; Operating as designed.	Licensing is compliant; versions are up to date to comply with vendor support requirements	Features, functionality, performance meets business expectations and requirements and is suitable to meet 5 yr technology road map requirements
Unlikely	Local resources readily available to source as needed; skills training available	Small number of failures reported.Minimal downtime	Licensing is compliant; Current service will be considered "end of life" in 3 years	Features, functionality, performance will not meet the business requirements planned in the next 4 years
Possible	Resourcing options available within North America at a premium cost.	Increase in number of failures reported over previous year; downtime hours impacting business operations.	Licensing is compliant; Current service will be considered "end of life" in 2 years;	Features, functionality, performance will not meet the business requirements planned within the next 3 years
Likely	No resource options within North America; limited availability outside of North America at premium cost	Material number of failures reported. Replacement parts difficult to source	Licensing is compliant; Current service will be considered "end of life" in 1 year	Features, functionality, performance will not meet the business requirements planned within the next 2 years
Almost Certain	Minimal to no options for resources that can provide support; training not available	Diagnostics predicting eminent hardware failure ; Priority software defects that vendor is not able to correct and no acceptable work around is available; hardware replacement parts cannot be sourced	Non- compliance with licensing requirements; Service is considered "end of life" by the vendor	Features, functionality, performance will not meet the business requirements planned within the next year

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General Plant

Projects under General Plant primarily involve information technology, communications and facilities initiatives. With the exception of IT which is ranked according to the matrix above, these other areas are too diverse to develop a comparable and useful ranking system across the groups, and therefore the determination of whether a project will proceed is based upon technical justifications or economic benefit.

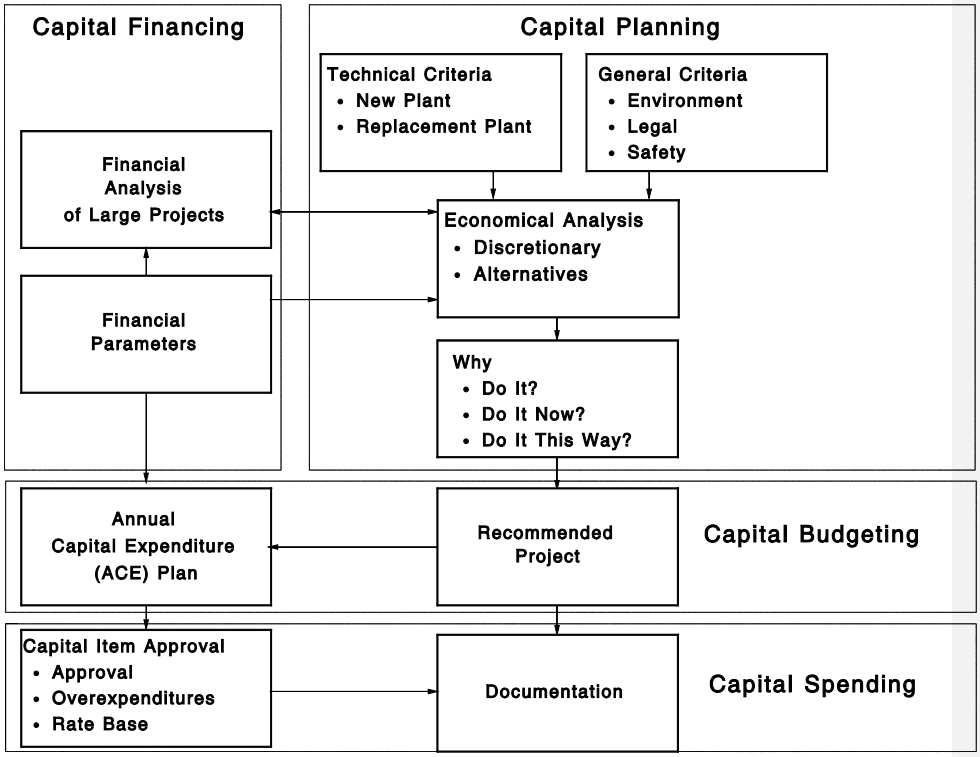
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6.3 Capital Planning Process

Originators and approver(s) of all capital projects follow disciplined capital planning, budgeting and execution processes.

Figure 1.0: Summary of NS Power Capital Planning, Financing & Budgeting



6.4 Accounting Policies and Procedures

NS Power's Accounting Policies and Procedures and Chart of Accounts require Board approval. Revisions to the Accounting Policies and Procedures and Chart of Accounts are submitted to the UARB for approval on an as needed basis. The NS Power *Accounting Policies and Procedures Manual* contains the guidelines for determining whether an expenditure is a capital or operating expense. NS Power began using United States Generally Accepted Accounting Principles (USGAAP) for external financial reporting on January 1, 2011.

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The following Accounting Policies and Procedures guide and direct NS Power's capital expenditure program:

- Rate Base (1520)
- Materiality (1560)
- Capitalization Limits (1560A)
- Generic Accounts (3350)
- Generic Accounts - Cross Reference to Capital Activities (3350A)
- Depreciation and Amortization Expense (5300)
- Amortization - Capital Contributions in Aid of Construction (5310)
- Capitalization of Cost (6000)
- Cost (6100)
- Cost Elements (6140)
- Construction Work in Progress (6200)
- Capital Expenditures - Land (6210)
- Capital Expenditures - Computer Hardware, Software and Telecommunications Equipment (6215)
- Capital Contributions in Aid of Construction (6220)
- Intangible Assets (6225)
- Application of Administrative Overhead (Self-Constructed Assets) (6230)
- Application of Administrative Overhead (Constructed Assets) (6235)
- Allowance for Funds Used During Construction (6240)
- Purchase Price Discrepancy (6250)
- Transfer Values (6260)
- Asset Retirement Obligations (ARO) (6320)
- Redundant Assets (6340)
- Assets - Not Used and Useful (6350)
- Long Lived Assets to be Disposed of by Sale (6360)
- Accumulated Depreciation (6400)
- Retirement and Disposal of Capital Assets (6420)
- Gain or Loss on Disposition of Capital Assets (6440)

Current and future interpretations of accounting policies and procedures will be made by the Corporate Accounting Department within the Controllers Division.

6.5 Capital Planning

Capital planning is a centralized function and ensures the capital projects included in the ACE Plan are those which provide maximum benefit to customers while allowing NS Power to meet its objectives. The capital planning cycle for any given year typically begins early in the preceding year and concludes at the filing of the ACE Plan.

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Although the oversight and management of the capital planning process is a centralized function, many capital projects are identified at the functional level (Generation, Transmission, Distribution, and General Plant) and brought forward for centralized review and approval. Centralized review and approval of all capital projects ensures the projects included in the ACE Plan are fully justified and consistent with NS Power's strategy.

There is a standard ranking methodology for Generation, Transmission and Distribution which is described in detail above. On an annual basis, projects identified are broadly ranked using the following criteria:

- Health and Safety: Operating Permits, Protection of Equipment and Personnel Safety
- Regulatory Compliance: Renewable Electricity Standards, GHG Regulations, Air Emission Regulations, NERC/ NPCC Requirements
- Customer Reliability: SAIDI, SAIFI, CAIDI
- Requirement to Serve
- Economics: Based on Revenue Requirement, Net Present Value of the Project, Levelized Cost Analysis, $/ Avoided Customer Hours of Interruption (ACHI)

Each year, the capital program includes those projects which are essential for health and safety objectives, regulatory compliance, and those which are required to provide service to a given area. Projects which serve to improve customer reliability are evaluated based on the probability factors related to performance targets (SAIDI, SAIFI, CAIDI, etc.). Economically justified projects are evaluated based on their economic and performance ranking. The capital program can be constrained by a number of factors including the ability to effectively execute the annual program with the available time and resources, the maintenance cycle of the generating facilities and company cash flow.

6.6 Capital Expenditure Justification Categories

All projects have a justification category. Some categories are specific to functional areas of NS Power that develop capital items, while others are more general in nature and affect capital decisions across the Company.

Examples of area-specific criteria:

- Work Support Systems
- Vehicles
- System Design

Examples of general criteria:

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- Environment
- Health and Safety

6.7 Economic Analysis

6.7.1 Economic Analysis Model

The Economic Analysis Model (EAM) is an electronic spreadsheet which calculates and compares the revenue requirement by comparing alternatives to complete the project and avoided costs.

With respect to alternatives to completing the project, all else being equal, the alternative with the lowest discounted revenue requirement will be the preferred alternative. A cash flow analysis determining net present value (NPV) of the alternative cash flows is also incorporated into the EAM to further evaluate the economics of the project.

The following are typical inputs into the model:

- Capital investment profile
- Operating cash flows, including avoided costs

The model calculates the following:

- Revenue requirement
- Income tax associated with the capital expenditures
- Discounted net cash flow at the after-tax weighted average cost of capital (WACC)
- Net present value (NPV), Internal Rate of Return (IRR) and discounted payback period for each alternative

Each year an updated version of the model is provided to users with current tax rates, depreciation rates and WACC.

With respect to avoided costs, avoided costs are calculated using probabilities of failure, unit capacity factors, avoided maintenance costs, and avoided replacement energy costs. Capacity factors and avoided replacement energy costs are forecasted for five years, beginning in the year of project construction. If the avoided costs outweigh the capital costs of the project, the project is considered economic. The timeframe in which the benefit of the project equals the avoided costs is considered the “pay-back period”. NS Power will use an estimate of inflation as an escalator for year six (6) onward to determine future year avoided replacement energy costs.

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On an annual basis, NS Power will compare its estimated inflation escalator to fuel forecasts for years 6 onward. If results materially vary, the continued use of inflation as an escalator will be more closely examined and discussed with stakeholders.

The benefits of the model are that it is relatively simple to use, promotes consistency of capital analysis across the organization and provides immediate information regarding the economics of alternatives. The model does not allow monthly cash flow entry. In this regard, where the results of alternatives are close, further review may be required.

Sensitivity analyses are incorporated into the model as adjustable variances for capital spend, avoided expenses, and timing of the project. These are adjustable to further test whether reasonable variances in those categories affect the rankings and therefore preference of alternatives.

With respect to various alternatives considered within an EAM, project developers will endeavour to provide realistic alternatives, and clarity on what is included in the costs comprising each alternative. Additional clarifying notes, if necessary, can be written onto the "Notes/Comments" section on the first page/tab of the EAM.

Administrative Overhead (AO) - Project capital cost and the revenue requirement analysis include Administrative Overhead (AO). While it is understood that costs included in NS Power's eligible expenses used to determine the AO rate are largely fixed, NS Power will examine further those projects where elimination of the AO credit from the revenue requirement analysis could affect the recommended alternative for economically justified projects. Where this occurs, NS Power will examine the effect of the AO amount more closely to determine the level of reduction to the AO credit which would change the recommended project, and based on this, provide appropriate comment on this in the Capital Item justification.

6.7.2 Revenue Requirement Directive in Annual Capital Expenditure Plan

In the UARB's 2011 ACE Plan decision, the Board provided the following directive:

> In future ACE Plan applications, NSPI is directed to make an approximate calculation of how the Plan will affect revenue requirements.

Beginning in the 2012 ACE Plan NS Power has provided the overall approximate impact of the ACE Plan on revenue requirement. Beginning in the 2017 ACE Plan and pursuant to the 2016 ACE Plan Terms of Consensus, NS Power also provides a version of the overall revenue requirement table based on stakeholder assumptions and calculation methodology.

The underlying principle in calculating NS Power's revenue requirement table and impact is that capital expenditures that equal NS Power's depreciation expense do not change

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the customer revenue requirement. The premise is that rate base is not growing or declining if capital expenditures equal the rate of depreciation. To the extent depreciation expense equals capital expenditures in a given year, there is minimal effect on rate base or associated revenue requirement and therefore it is excluded from the calculation.

The revenue requirement impact considers the following inputs:

- Capital expenditures compared to forecasted depreciation expense annually.
- Administrative overhead credit based on the proportion of capital expenditures in excess of depreciation expense in each year.
- Depreciation expense of assets added during the examined timeframe based on the proportion of capital expenditures in excess of depreciation expense of all assets in each year.
- Incremental interest based on the cost of debt multiplied by the portion of debt to total capital of the incremental rate base.
- AFUDC based on the proportion of capital expenditures in excess of depreciation expense of all assets in each year.
- Income taxes based on the resultant effects and prorated Capital Cost Allowance for tax purposes.
- Net earnings based on the rate of return multiplied by the portion of equity to total capital of the incremental rate base.
- Additional fixed cost recovery received from customer growth achieved through capital investment to serve these customers.

Depreciation expense and additional fixed cost recoveries are delineated in the overall revenue requirement calculation presented in the ACE Plan.

An important consideration is that this method does not address the revenue requirement impact should the capital projects not be completed. This includes avoided costs such as increased fuel costs, increased repair costs, and other risks or implications. The Economic Analysis Model used to decide whether an economically justified capital project is the best option for customers includes estimates of the avoided expenses, but these are not included in this revenue requirement calculation. Similarly, any resulting operating savings associated with a capital project are not incorporated. The revenue requirement calculation examines solely the incremental effects with rate base.

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To expand on the methodology for revenue requirement impact described above, a separate table examining the impact on revenue requirement of economically justified (i.e. discretionary) projects is provided. The table presents the effect on revenue requirement of the project alternatives compared to the recommended options for the period presented in the ACE Plan. The project alternative revenue requirements are totaled to demonstrate the effect on annual revenue requirement of selecting other than the recommended alternative.

6.7.3 Production Costing Model

A system modelling tool used by NS Power to provide detailed forecasts of fleet dispatch and production costing which reflect the increasing complexity of the system.

6.7.4 Levelized Cost

NS Power also periodically utilizes levelized cost methodology to justify capital investments. This approach employs an economic modelling methodology used to provide a present value of the total cost of a project (and alternatives) over its economic life converted to a levelized unit cost (typically in $/MWh). The levelized cost model as used by NS Power calculates the present value based upon the annual revenue requirement for the project throughout the term. The levelized cost analysis is useful when comparing generation projects of different technologies and/or comparison to Power Purchase Agreements.

6.7.5 Total Cost of Ownership

In the UARB's 2022 ACE Plan decision, the Board provided the following directive:

> [T]he Board directs NS Power to use a TCO for IT projects over $1 million when an EAM is not provided, whether or not an alternative is available.

Total cost of ownership (TCO) is the cost of a new or upgraded capital asset plus all capital costs and operating expenses over its expected useful life. It accounts for all the capital and operating costs, including the upfront capital costs. In addition to providing a comprehensive understanding of the total cost of a capital investment over the course of its useful life, a TCO is also a useful tool for comparing capital investment options to determine the best value for money.

The TCO timeframe should match that of the expected useful life of the IT software or hardware. This allows for the flexibility to select an appropriate timeframe for a TCO analysis that is in keeping with the useful life of an investment rather than a prescribed timeline.

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6.8 Capital Financing

Capital financing is a centralized function of NS Power, which deals with the affordability of capital expenditures on both an individual project and aggregate capital program basis. Control is achieved through determining the financial parameters for economic analysis and providing and coordinating financial analysis for large capital projects.

Financial Parameters: that influence economic analysis include the cost of capital (calculated as the weighted average cost of capital), depreciation rates for service life, depreciation rates for tax purposes (capital cost allowance - CCA), inflation rates and income taxes. To assist in selecting projects that are economic, other financial guidelines are employed. For projects that are otherwise equal in their net present value, benefits for customers are judged on payback characteristics and rate effects.

Financial Analysis: examines the impacts of the projects that are most likely to have an effect on NS Power's financial position, including debt/equity ratio, rate effects on customers, financing plan, financial plan, share prices, bond rating, etc.

The investing decision is separated from the financing decision in the sense that the cost of capital rather than the cost of the expected source for financing is used in the analysis of the investment.

6.9 Capital Budgeting

Capital budgeting is a vital part of the corporate planning process because it is at this stage that NS Power assesses future scenarios and commits the financial and physical resources needed to achieve its objectives. The process consists of the following:

1. Consolidating the estimated cost for all the individual projects approved for inclusion in the ACE Plan from the functional areas of NS Power. Consolidation is a centralized function;

2. Developing an Annual Capital Expenditure Plan (ACE Plan); and

3. Continual re-evaluation of projects after their acceptance.

The ACE Plan is comprised of those capital projects and programs that NS Power is able to and prepared to fund. The process for finalizing the ACE Plan gives consideration to financial matters that govern NS Power's ability to fund the aggregate capital program, and the Capital Expenditure Justification Criteria included herein.

The ACE Plan is approved by NS Power's Executive Team and submitted to the UARB for approval.

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6.10 ACE Plan Projects

ACE Plan projects are those that are individually justified in accordance with the CEJC and allow NS Power to meet its objectives. All ACE Plan projects must answer the following questions in order to be considered justified:

1. Why do this project?
2. Why do this project now?
3. Why do this project this way?

A capital expenditure is not justified until the need is established and it is demonstrated that the proposed project is the best alternative being implemented at the optimal timeframe.

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6.11 Additional Perspectives on Capital

Capital Functions

To enable appropriate cost allocation among customer classes and consistent depreciation practices across asset groups, NS Power capital expenditures are categorized according to the following utility functions:

Generation: Includes expenditures for NS Power Thermal, Hydro, Natural Gas and Renewables.

Transmission: Includes expenditures for the replacement, reinforcement or expansion of the transmission system, which transmits electrical energy from the generation plants and the NB Power/NS Power interconnection throughout the Province. Transmission includes facilities operating at voltages of 69 kV or higher.

Distribution: Includes expenditures for the replacement of and additions to equipment for delivering electrical energy from points on the transmission system to customers served at voltages below 69 kV.

General Plant: Includes expenditures for computer software, computer infrastructure, communication equipment, furniture, office equipment, tools, vehicles, land and buildings (other than generating and substation facilities).

6.11.1 Essential and Discretionary Capital

Within these categories, capital expenditures may be viewed as either:

Essential: A capital addition or replacement which must be made to satisfy technical, legal, safety, or environmental directives. Capital projects that are deemed to be essential generally meet one of the following criteria:

1. Required by law or regulation

These are capital projects that must be undertaken to conform with laws or regulations that govern NS Power's operations.

Examples: New customer connections
Environmental projects
Civic responsibility
Safety projects

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2. *Emergency*

   Projects that usually arise as a result of an unforeseen event. These projects must be undertaken in order to maintain NS Power operations.

3. *Technical Criteria*

   Technical criteria are established on the basis of the need to continue reliable supply of service. Failure to meet these criteria will result in a loss or degradation of service below acceptable levels.

Discretionary: Capital expenditures that are deemed to be discretionary are:

- Investments made solely on the basis of economics.
- There is a "do nothing" alternative.

The decision to pursue discretionary projects may yield defined benefits that minimize the revenue requirements of NS Power.

Alternatively, not proceeding with the project, the "do nothing" alternative, is an acceptable option whereas discretionary projects are based solely on economics, and the project is not addressing a pressing safety, legal, reliability or technical scenario.

For example, an acceptable "do nothing" alternative may be not proceeding with a generation capital project designed to increase the heat rate efficiency of the unit. Not proceeding with such a project, and therefore foregoing increased heat rate efficiency, does not impact the safe and reliable operation of NS Power's system.

Generally with discretionary investments, NS Power seeks projects that provide returns which minimize or reduce revenue requirement. Financial and strategic priorities may not permit NS Power to undertake all, or even any, discretionary capital expenditures in any given year.

This perspective links capital expenditures to the priorities of NS Power. Certain capital expenditures are essential and sufficient capital funds must be available to undertake them. NS Power has the discretion to request approval for funding for additional capital projects based on the economics of the projects.

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NS Power has the flexibility of setting objectives for discretionary projects so as to achieve financial or strategic objectives, for example minimizing investment risk or achieving rate reductions. The financial parameters established for the economic evaluation of alternatives and for determining the maximum capital budget comprise the internal controls for limiting spending on discretionary capital projects.

6.11.2 Documentation

Internal NS Power documentation is prepared and retained for every capital project. Refer to Appendix B.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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7.0 Capital Planning Financial Criteria & Policies

- NS Power will be responsible for creating financial criteria for the Company.
- Accountability to develop and maintain the general and function-specific justification criteria resides in identified areas of NS Power.
- Capital planning, as a function, is distributed throughout NS Power, but is centrally managed. The respective functional areas of NS Power are accountable for developing, analysing and documenting projects and submitting all items to the Capital Planning group for review and approval.
- Accounting policies and procedures will be presented to the UARB for their approval prior to implementation. These policies and criteria are presented to the Board for approval through a separate proceeding, or can be incorporated within a proceeding, such as the Annual Capital Expenditure Plan.

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8.0 Financial Parameters

8.1 Introduction

The capital program is financed through a combination of debt and equity. The weighted average cost of capital (WACC) is the average of the costs of these sources of financing, each of which is weighted by its respective use to fund the activities of NS Power. The weighted average calculation identifies the cost NS Power has to pay for every dollar it finances. WACC is used to calculate Allowance for Funds Used During Construction (AFUDC) applied to eligible capital projects. The WACC used by NS Power to calculate AFUDC will be the WACC most recently approved by the UARB. NS Power applies for approval of an AFUDC rate annually through a separate proceeding.

In making investments in capital projects, NS Power must be aware of a number of financial factors which are important in economic analysis:

- Cost of capital
- Depreciation
- Inflation
- Taxes
- Competition for investment capital in capital markets
- Investment risk

The rationale for each factor and the basis for its use in determining the economics of capital projects is presented below.

8.1.1 Cost of Capital

NS Power finances capital expenditures through:

- Debt
- Preferred shares
- Common shares
- Retained earnings

Each of these sources of financing has a cost. Debt-holders require semi-annual payments of interest, preferred shareholders expect quarterly dividends, and common shareholders require both a quarterly dividend as well as a future return on the earnings reinvested in the business as retained earnings. The cost associated with each source of financing varies according to the financial risk represented by each type of capital.

The weighted average cost of capital in today's financial markets for NS Power represents the minimum acceptable return the Company must earn on its capital investments to compensate investors for the use of their funds to finance capital projects.

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NS Power Capitalization Structure

The mid-point of capital structure ranges approved by the UARB is used as the basis for calculation of Cost of Capital.

Long Term Debt Structure

The debt structure is based on the target structure accepted by the Board of Directors of NS Power. The annual rates for new debt capital will be calculated from the Treasury Division's long term forecast of the cost of debt.

Equity Structure

NS Power's equity structure consists of common equity with a range of allowed return established by the UARB and preferred equity with a return established by the prevailing market conditions at the point in time when it was issued. The cost of new common equity used in the calculation of the weighted average cost of capital is the point of the range used to set rates on common equity allowed by the UARB. The cost of preferred equity used is the Treasury Division's long term forecast of the cost of new preferred equity issues.

Cost of Capital

The Cost of Capital is calculated as the weighted average cost of capital (WACC) based on the capitalization structure.

The Cost of Capital is the rate of return on capital investments that is required by NS Power to pay for the use of the investors' capital employed by the Company. It is NS Power's long term Cost of Capital.

NS Power revises its Cost of Capital annually. NS Power submits the revised WACC calculation as part of the AFUDC rate approval request. Economic Analysis Models for projects included in the ACE Plan will also incorporate NS Power's proposed WACC.

8.1.2 **Depreciation**

When NS Power acquires financing for its capital program, it takes on an obligation to repay the investment. This is accomplished through the setting aside, from an accounting perspective, of a certain amount of funds annually for the purpose of repayment of the investment. This amount is called depreciation. The estimated useful life of the capital asset forms the basis for calculating the annual depreciation rate.

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Two general approaches are used to establish the annual depreciation rate – life span (production plant) and mass property (transmission, distribution and general plant). The life span approach applies generally to large single investments such as a thermal generating plant. The mass property approach applies generally to such assets as distribution lines that, through interim replacements, might be expected to have an indefinite life.

In the latter instance the characteristics of the on-going failures of the materially significant components of the asset are important to calculating the depreciation rate. NS Power uses the Iowa Curves to establish annual depreciation rates that account for the dispersion characteristics of plant failures.

The specifics of the depreciation rates employed for each type of plant are provided in NS Power's Accounting Policies and Procedures Manual, Section 5300.

8.1.3 Inflation

The cost of goods and services tend to increase over time, an effect called inflation. This is taken into account in calculating future costs for economic analyses. NS Power will estimate the general inflation rate and escalate the costs used in its analyses accordingly. Special inflation rates may be developed for particular costs (e.g. fuel) and these escalations will be justified individually.

8.1.4 Taxes

NS Power is subject to Provincial and Federal income tax on its earnings, and Federal Part VI.1 tax on its preferred dividends. The economic analysis must include the effects of these taxes.

In addition NS Power pays annual grants to municipalities of Nova Scotia, in lieu of all municipal taxation other than Deed Transfer Tax. These grants bear no relationship to NS Power's capital assets and they are not included in the economic analysis of the alternatives.

NS Power also pays the Harmonized Sales Tax on certain goods and services. Because this tax is fully refundable, it is not a relevant cost for capital budgeting purposes since it does not result in any differential costs to NS Power.

8.1.4.1 Taxes in Economic Analyses

Income tax is included in the economic analysis of capital projects.

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Taxes on the earnings associated with the capital expenditure are included in the economic analysis of alternative projects. The Federal and Provincial taxes on earnings are calculated on taxable income. This is derived from gross income by allowing certain deductions. These deductions include operating and maintenance expenses, capital cost allowance (tax depreciation), preferred dividend tax credits and interest on debt.

Depreciation expense is treated differently for tax purposes than for rate-making purposes.

Depreciation

For rate making purposes, depreciation is the process by which capital invested is recovered. The useful life estimations and other significant assumptions are periodically reviewed and the results filed with the UARB for approval. Depreciation expense is not included in the calculation of taxable income or cash flows. It is recognized in the calculation of revenue requirement.

Capital Cost Allowance

CCA is depreciation for tax purposes. CCA is a deduction against taxable income. Capital Cost Allowance is based on the classification of the asset for tax purposes

Allowance

As per Schedule II - Capital Cost Allowances, of the Income Tax Regulations, CCA is established on the basis of specific classifications for tax purposes, whereas depreciation expense is based on the useful life of the plant.

8.1.5 Competition for Capital

NS Power must compete in the financial markets for the investment capital that it needs to fund its capital program. It must maintain the confidence of investors so that it has access to capital at attractive rates. The market will demand increased returns, either through higher coupon rates or lower share prices, for investments in which it has less confidence (perceives higher risk). Decisions regarding the individual projects in which NS Power invests, and the total capital investment made by the Company, must respect this market confidence. Because of their larger impact, each significant individual capital investment will receive a thorough financial analysis to satisfy NS Power that, in addition to being economic, it is a financially sound investment.

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In evaluating any particular capital project, it is helpful to create a hierarchy to provide a preliminary ranking of prospective projects. As all projects can be classified as being either essential or discretionary, essential capital projects will receive first priority in the allocation of capital. Refer to Section 6.11 - Additional Perspectives On Capital - for further information regarding these classifications.

8.1.6 Investment Risk

Risk exists in capital budgeting when more than one outcome may occur. A quantitative evaluation of a capital expenditure proposal requires that several predictions be made, often far into the future. As a general rule, the risk associated with achieving an expected cash inflow or outflow in a given year increases as one moves further into the future, as there are more factors in the long term which cannot be foreseen but which will affect cash flows.

There are essentially two types of project investment risk:

Inherent Risk: varies with the nature of the project and generally relates to unknowns about successful performance.

Traditional Risk: results from errors in estimates and assumptions that affect the probable revenue requirement associated with the project.

In addition, the decision to undertake a project may involve certain corporate strategic risks where the outcomes of the decision could affect business flexibility or create other costs not directly related to the project.

In order to minimize NS Power's exposure to inherent risk, the Company may establish a project-level cut-off rate for individual discretionary projects. This will occur if the perceived investment risk for the project differs substantially from the general risk levels of NS Power. This limits the overall investment risk exposure of NS Power from the project level perspective. However, corporate priorities may dictate that individual projects will be accepted at cutoff rates as low as the cost of capital despite the investment risks at the project level.

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9.0 Economic Analysis of Alternatives

9.1 Introduction

The guiding principle of economic analysis is to seek the most economic alternative based on establishing which alternative, among a number of alternatives that satisfy basic requirements, yields the best value for customers and NS Power. Within the analysis, both traditional and non-traditional alternatives are reviewed prior to initiating a capital item. This guideline will review relevant factors and their use in identifying the most economic alternative.

An outcome of the analysis is that, when estimates of revenues are included, an estimate of the amount of contribution towards lower costs offered by the alternative is produced. Certain investments required of NS Power may have no lower cost contribution; that is, they return no revenues beyond that required to exactly recover costs. The minimum revenue requirement method serves, in this case, to identify the alternative that results in the least amount of cost to NS Power and its customers.

The essentials of conducting an economic analysis of alternatives may include, when appropriate:

- Analysis methodology
- Financial parameters
- Cost components for analysis
- Analysis period
- Calculating the net present value
- Sensitivity analysis

9.1.1 Analysis Methodology

Production-costing models are used by NS Power to estimate replacement energy costs and generator capacity factors in the EAMs for a period of five years. NS Power uses an estimate of inflation as an escalator for years six (6) onward to determine future year avoided costs.

On an annual basis, NS Power will compare its estimated inflation escalator to fuel forecasts for years 6 onward. If results materially vary, the continued use of inflation as an escalator will be more closely examined and discussed with stakeholders.

9.1.2 Financial Parameters

Certain financial parameters are required to undertake an economic evaluation of capital expenditures. They are:

AFUDC: The cost-of-capital invested in construction work in progress is included in an allowance for funds used during

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	construction ("AFUDC") as an addition to the cost of property constructed using a weighted average cost-of-capital.
Book Depreciation:	The difference between the amount of book value for an asset and how much depreciation is assessed on the asset.
Cost of Capital:	The weighted average cost of all capital employed by NS Power.
Taxes:	The taxes payable by NS Power on its earnings and the capital it employs to finance projects.
Capital Cost Allowance:	Depreciation expense for tax purposes (also known as the CCA).
Inflation Rates:	The rates to be used to establish the future prices of goods and services.
Discount Rate:	The cost of capital rate adjusted by other factors such as risk premiums.

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9.1.3 Cost Components for Analysis

The cost components of the economic analysis are as follows:

1. Relevant costs
2. Cost estimates
3. Receipts from the sale of by-products
4. Unequal lives

9.1.3.1 Relevant Costs

The estimate of the costs and benefits of a capital project should show the difference in revenue requirement as a result of undertaking the project.

9.1.3.2 Cost Estimates

Reliable estimates and forecasts are vital to the capital investment decision. A sophisticated process of analyzing financial information and managing the decision related to a project is of little value if a casual approach is taken to development of these estimates. Effective management of capital expenditure decisions, therefore, requires that controls be designed and operated to ensure that projections are realistic at the time decisions are made.

When estimating costs for capital expenditures, the following guidelines should be applied:

1. Only future revenues and costs after the payment of tax on income are relevant. Historical costs may be useful in terms of providing a basis for prediction, but they do not represent what future costs will be. A cost that occurs before the decision is implemented, that is, a past or “sunk" cost, cannot be influenced and must therefore be ignored.

2. Only differential revenues and costs are relevant. This means that only the difference in revenue requirement between implementing or not implementing a proposal need be considered.

3. Opportunity costs are relevant. If a resource can be used more than one way, it has an opportunity cost. In general terms, an opportunity cost is the benefit lost by taking one action as opposed to another.

It is the revenue requirement generated by an investment project that is of primary importance in an economic analysis. As used in the context of this guide, payment means a cash flow from NS Power to an outside entity, and non-cash

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payments including items such as AO and depreciation. The date of payment, as well as the magnitude of these payments, must be estimated.

Cost allocations, charges and transfers between different parts of NS Power are not payments to an outside entity, and must not be used for economic cost comparisons unless they can be shown to accurately reflect such payments (e.g. internal labour used in achieving the required result is included in the estimated costs of alternatives). Items withdrawn from stores or spares do create payments to an outside entity when they are replaced and must be included in the estimate.

9.1.3.3 Receipts from the sale of by-products

A by-product is any physical result of an alternative which is not a part of the required result. Some examples of by-products are: assets which become surplus to requirements, electricity sold outside Nova Scotia, and flyash used for making concrete. Receipts from the sale of by-products are included in the determination of the minimum revenue requirement by including them as credits to operating & maintenance costs.

9.1.3.4 Unequal Lives

Alternative capital investments can have different useful lives. To make a valid comparison when the future payments are not equal it is necessary to equalize the lives of the projects. One method is to assume a chain of replacements where the analysis covers the same number of years.

Alternatively, terminal values can be used to shorten the period in an economic cost comparison to avoid some of the effort required to include all the significant cash flows under the chain replacement method. Terminal values must not be used to shorten the period to less than the expected life of any major asset required by the alternatives. The terminal values of capital expenditures can be determined using the following techniques:

1. When an active market exists for a capital asset, such as an automobile, the potential net receipts from sale of the asset must be used as the terminal value.

2. When no active market exists for a retained asset, such as a distribution line, the replacement value to NS Power must be considered. Unless in the judgement of the estimators a better criterion of this value is available, the terminal value should be a straight line proration of the replacement cost based on remaining service life.

   For example, if a distribution line is expected to have a third of its service

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life remaining at the end of the comparison period, and to have a replacement cost of $450,000 at that time, it should be assigned a terminal value of $150,000.

Terminal values, also called retention or residual values, are included in economic cost comparisons as receipts.

9.1.4 Analysis Period

Depending on the nature of the capital investment, the analysis timelines will vary.

9.1.4.1 The Planning Horizon - Economic Life

The criterion to estimate the life of a project is the continued ability to generate satisfactory cash flows or other intangible benefits. The economic life of a project is the least of its physical life, technological life, or product market life, or the point where cost differences between discounted alternatives are so small they are insignificant.

9.1.4.2 Physical Life

Physical life represents the time taken for an asset to become physically worn, or consumed so that it can no longer be efficiently maintained and must be replaced. However, equipment will often be disposed of before its physical life has expired.

9.1.4.3 Technological Life

Technological life is the period of time that elapses before an even newer machine or process becomes available which would make the proposed machine or process obsolete. Improvements will almost certainly be made sometime in all machines or processes now in existence, but questions of which machines or processes will be improved, and how soon they will be on the market, are most difficult to answer. To ignore a product or machine's technological life is to imply that the technological life is the same as the physical life.

9.1.4.4 Product Market Life

Although a machine may be in excellent physical condition, and there may be no better machine on the market, its economic life has ended for the organization as soon as the manufacturer ceases to produce the product, market the product, or provide spares and services.

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9.1.5 Calculating the Net Present Value (Worth)

The estimates prepared for economic cost evaluations must include, as a relevant cost, the time value of money. Capital investment decisions require investing money now to bring more money in the future. The time value of money is an opportunity cost; by making a particular investment now, we give up the opportunity to make other investments.

The common time is called the present and the process of converting future costs to the present is called discounting. Discounting changes the magnitude of an estimate according to a compound interest formula. The degree of change depends on the time interval involved and on the compound interest rate, that is, the discount rate.

Interest, principal repayments, and dividend amounts are not included in the cash flows for discounting purposes. The investment decision is based on the revenue requirement of the project, regardless of how it is financed. Using the cost of capital as the discount rate automatically provides for not only the recovery of the investment, but also a return on the investment at least equal to the cost of capital.

After the estimates have been converted to their present worth equivalents, they are totalled and cash receipts and terminal values are subtracted from costs.

In the Economic Analysis Model the net present value (worth) differences between alternatives are then calculated, the alternatives ranked according to their net present value (worth), and the alternative with the lowest present cost (or highest present value, in the case of economic projects) is identified.

9.1.6 Sensitivity Analysis

An economic cost comparison cannot be given its proper weight in a decision without some indication of its sensitivity to input assumptions; that is, of the confidence that can be placed in its results. The potential sources and likelihood of error in the ranking of alternatives can be determined by a sensitivity analysis.

Sensitivity analysis gives NS Power an idea about how unfavourable variance occurrences like lower volumes, shorter useful lives or higher costs affect the economics of a project. It is a technique which is used to identify those estimates which are the principal contributors (key factors) to the risk that an inferior alternative will be chosen. In this technique, the estimates which have the greatest impact on the comparison are identified, usually by changing each one in turn by a given proportion, e.g. 10%. Then, the effect of varying these estimates through a range of values (e.g. from a minimum to a maximum) based on possible inaccuracies in forecasts and assumptions is evaluated. Those estimates that significantly change the comparison, when varied through this range

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of possible values, are candidates for additional estimating effort directed toward reducing the range.

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10.0 NS Power Capital: Types of Capital Applications Submitted for UARB Approval

- Capital projects submitted to the Board in the Annual Capital Expenditure Plan (ACE).
- Capital projects identified in the ACE Plan requiring subsequent submission to the Board.
- Capital projects included in the ACE Plan, but for which the Board has withheld approval in the ACE Decision (typically requires a filing by NS Power of additional supporting information, in a separate, or revised capital application).
- Unforeseen and Unbudgeted (U&U) capital projects. These projects are not included in the ACE Plan and are filed separately for Board approval.
- Planned and Advanced (P&A) capital projects. These projects are not included in the ACE Plan and are filed separately for Board approval.
- Authority to Overspend (ATO) applications. These applications represent request for UARB approval of over-expenditure on a capital project or routine.
- Scope Change applications. These applications represent request for UARB approval of scope changes within a previously UARB approved capital project. This is independent of any variances in costs.
- Final Cost (FIN) applications. These applications are required for UARB approval if final costs of the project are over or under the specified spend thresholds. They consist of final cost details and variance analysis.

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11.0 Requirements for UARB Approval

11.1 General Requirements

NS Power is a public utility, subject to the provisions of the Public Utilities Act (the Act). NS Power is subject to general supervisory oversight of the UARB. Section 35 and Section 35AA (October 30, 2019) of the Act provide the following:

> 35 No public utility shall proceed with any new construction, improvements or betterments in or extensions or additions to its property used or useful in furnishing, rendering or supplying any service which requires the expenditure of more than two hundred and fifty thousand dollars without first securing the approval thereof by the Board.
>
> 35AA (1) In this Section, "large-scale public utility" means a public utility with an annual revenue of one hundred million dollars or more.
>
> (2) A large-scale public utility is not required to secure the approval of the Board under Section 35 for new construction, improvements or betterments in or extensions or additions to its property used or useful in furnishing, rendering or supplying any service that requires the expenditure of one million dollars or less.

The Board may approve, or disallow capital projects requested by NS Power. The Board's approval may be in the amount applied for by NS Power or another amount the Board considers appropriate. The form of Board review is determined by the Board and may involve direct review by the Board, its staff and consultants and/or a public hearing, either oral or written.

NS Power retains the discretion to defer or cancel capital projects submitted and/or approved by the Board based on condition reassessment and reprioritization in accordance with engineering, business judgment and resource availability. Any projects cancelled or deferred are reported in the Quarterly Capital Reports.

11.2 Capital Application Requirements

Supporting documentation is provided with each capital work order application. The following information will be filed with each capital application in the project description, as relevant:

- Project Start Date
- Project In Service Date
- Project Final Cost Date
- Utility Function
- Forecast Amount
- Projects Estimated Useful Life

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- Depreciation Class

Related Projects approved or having taken place in the past 2 years, current year or anticipated for the next 2 years including the projects' estimated costs. When multiple projects relate to the same asset, or initiative they should be grouped as a package.

Project Description

Justification Criteria Including:
- Sub Criteria (when applicable)
- Description of why the project is being undertaken (i.e. Why do this project?)
- Description of why the project is necessary at the time proposed (i.e. Why do this project now?)
- Description of why the project will be carried out in the manner proposed (i.e. Why do this project this way?)
- Whether the work will be undertaken by an affiliate and reason for affiliate involvement

Summary of Related Capital Items

A list of related capital projects that have been or are scheduled to be completed within +/- 2 years of the submitted project will be included in capital applications.

A project can be considered related if it meets the following parameters:

Steam/Gas Turbine – Work completed on the same asset (turbine, boiler, etc.) and on the same unit (Lingan Unit #3, for example).

Hydro – Work completed on the same generating unit and dam structures, but not necessarily the same asset.

Wind – Work completed on the same Wind Farm site.

Transmission & Distribution – Work completed on the same asset class (Padmount transformers, Breakers, etc.) or in the same location (feeder, Transmission Line).

General Plant – Work completed on the same asset (application, building, etc.).

Cost Support - This may include but is not limited to:

- Supplier quotes, or estimates
- Significant contract terms & conditions
- Management's best estimate based on previous experience or related projects

Additional Information required to justify the project - This may include but is not limited to:

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- Engineering/condition assessment reports
- Independent consultant reports
- Planning studies
- Business cases

Cost Benefit Analysis - This may include but is not limited to:

- The Economic Analysis Model; including inputs, assumptions, and results for all alternatives
- The Levelized Cost Model; including inputs, assumptions, and results for all alternatives
- Production Costing Modelling Results
- NS Power procurement documentation and recommendations; (i.e. Requests for Expressions of Interest and Requests for Proposals)

Project Due Diligence Summaries

Industry Information

Real Estate Information - This may include but is not limited to:

- Lease agreements
- Property evaluations and assessments

NS Power Performance Data - This may include but is not limited to:

- Load statistics
- Outage performance data
- Annual maintenance schedules
- Historical results for multi-year projects
- Internal NS Power reviews
- Operating performance indicators

Technical Details - This may include but is not limited to:

- Substation drawings
- Line drawings
- System Impact Studies
- Generation Interconnection Agreement

Stakeholder Information - This may include but is not limited to:

- Government legislation

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- Letters of project support
- Stakeholder engagement communication

11.3 Capital Costs Incurred Prior to Application

NS Power strives to submit all capital applications to the UARB for review and approval on a timely basis. Capital costs incurred prior to application submission will be subject to the criteria noted below with respect to their inclusion into rate base.

Preliminary Engineering Projects

Each quarter, any spend above $1,000,000 associated with a preliminary engineering project that has been inactive (i.e. no internal or external engineering or scoping work, exceeding $10,000, being carried out within the last 12 month period) will be removed from rate base until such time as the preliminary engineering becomes active again or these costs are submitted for approval to the UARB.

Under $1,000,000 Projects Subsequently Exceeding $1,000,000

Projects originally budgeted at less than $1,000,000, but subsequently exceeding that threshold during project execution, must be filed with the UARB for approval no later than within six months of the project exceeding $1,000,000. Any projects that do not get filed within this timeframe will have all costs in excess of $1,000,000 removed from rate base in the quarter after the six month timeframe until these costs are submitted for approval to the UARB.

Capital Projects in ATO Position

If a previously approved capital project exceeds the allowable variance of the greater of 5% or $250,000 and is not filed within six months of exceeding the approved amount, then the costs in excess of Board approval will be removed from rate base each quarter until these costs are approved by the UARB.

Unapproved Plant in Service Spending

Any capital item with unapproved plant in service above $1,000,000 that does not fall under any of the above categories, and where a capital work order has not been filed with the Board within 6 months of the project's completion, the spend to date on that project in excess of $1,000,000 will be excluded from rate base each quarter until such time as the work order is filed.

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12.0 Authorization to Overspend (ATO) Requirements

12.1 Individual Capital Item ATO

Approval to Overspend (ATO) applications are intended to request Board approval prior to incurring additional expenditures above the approved amount. Individual capital items (non-routine) that are tracking final costs with a variance of more than the greater of 5% or $250,000 must be submitted as ATO applications, within 6 months, if NS Power intends to include costs in excess of Board approval in its regulated rate base.

The reporting included with the Quarterly submission of capital project applications will provide the budget, forecast and actual financial details in a one line format for all projects. Those projects that are tracking final costs with a variance of more than the greater of 5% or $250,000 will be specifically identified.

The following documentation shall be filed with the Board in an individual capital item ATO application:

- Updated UARB approval sheet reflecting the revised project amount;
- Revised Capital Item Description Page reflecting the revised project amount;
- Cost support for the ATO request; and
- Updated economic analysis and / or production costing modelling results (if applicable).

12.2 Individual Capital Item Scope Change

Scope Change applications are intended to request Board approval prior to proceeding with a change in scope as compared to the previously Board approved scope. Scope Change applications may experience cost variances from the original application, but are submitted regardless of whether the thresholds for ATO and FIN applications have been exceeded. In the event a project has exceeding the ATO and FIN cost thresholds and has also experienced a scope change, the project will be submitted as a combined ATO or FIN and Scope Change application.

The following documentation shall be filed with the Board in an individual capital item Scope Change application:

- Updated UARB approval sheet reflecting the revised project amount if applicable;
- Revised Capital Item Description Page reflecting the revised scope change;
- Cost support for the ATO request (if applicable); and

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- Updated economic analysis and / or production costing modelling results (if applicable).

12.3 Routine Capital ATO

Routine capital ATOs are based on the annual budget of individual sub-routines noted in the preceding ACE Plan.

Those sub-routines with variances compared to the annual budget of more than the greater of 5% or $250,000 will require submission to the UARB for review and approval in the first half of the following year.

The following documentation shall be filed with the Board in a sub-routine capital ATO application:

- UARB approval sheet including the sub-routines subject to overspend, the revised sub-routine amount, variance amounts, and detailed variance explanations for each in the comments section.

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13.0 Final Cost Application (FIN) Requirements

Individual capital item projects that have realized a scope change or have final costs with a variance of more than the greater of +/-5% or +/-$250,000 will require that a final cost application be submitted to the Board for approval.

Projects not falling within this threshold may require final cost applications as requested by the UARB.

The information provided in these submissions includes:

- Updated UARB approval sheet reflecting the Final Cost amount;
- Revised Capital Item Description Page reflecting the Final Cost of the project;
- Line by line project account variance explanations will be provided for those accounts with material variances; and
- Project scope variances.

All projects should be final costed within six months of their in-service date. Exceptions to this requirement will be required on occasion. A final cost submission may be delayed due to certain circumstances or unique projects. Circumstances may include not receiving final vendor invoicing in a timely fashion. Unique projects may include projects for which in-service dates are well in advance of project completion. In all cases where final costing capital work orders are submitted past six months after their in-service, justifications for the delay will be provided.

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14.0 Retirement of Capital Assets

NS Power retires capital assets for various reasons, including:

Normal Wear and Tear

This is referred to as normal deterioration of physical plant caused by use over time and usually occurs because of the physical deterioration of the asset. This type of retirement usually causes an asset to be scrapped.

Inadequacy

This usually occurs because of such items as customer safety, employee safety, public safety, increased customer demand.

The asset can no longer be used safely or cannot supply the customers adequately. The asset is retired but could be reused in another location.

Technical and Economic Obsolescence

The asset is technically obsolete or becomes redundant and no longer economically supplies customers' needs. The asset is retired but could be reused in another location.

Public Authority Requirements

The asset is required to be removed and or replaced for some of the following reasons:

- Environmental regulations (e.g. PCBs)
- Regulatory requirements (e.g. meter replacement)
- Highway relocations

The asset is retired but could be reused in another location.

Customer Requirements

The asset currently serving the customer does not meet customer requirements in a manner other than adequacy and efficiency of supply (e.g. customer requests underground service).

The customer usually pays for any of these requests but the assets must be retired. However they could be reused elsewhere.

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Procedures

When capital assets reach the end of their useful life and are no longer able to contribute to the service of customers, they must be retired from the Plant in Service records at their original cost. In doing so, they are removed from rate base.

For retirements of property, plant and equipment other than land and entire production plants, the original cost plus any costs of removal less salvage proceeds is charged to accumulated depreciation, with no immediate gain or loss recognized.

Gains or losses on capital assets, with the exception of land, are deferred and depreciated over the remaining life of the assets, in accordance with depreciation rate filings with the Nova Scotia Utility and Review Board.

The only exception to this policy concerns the sale of land, in which the resulting gain or loss is recognized immediately.

In those cases where the disposal of land requires expenditures to address environmental issues, then this transaction will be viewed on its own merit, as per approved financial policies.

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15.0 Routine Expenditures

15.1 Foreword

NS Power's Routine Program (the Program) is organized and managed through a subset of capital items (Routines) which are provided below. The Program provides for recurring annual allocations of funds for high volume, repetitive, like-for-like capital replacements, enhancements, or additions that are expected to continue into the foreseeable future.

The Program is held to the same standards as individual ACE Plan projects with regards to compliance with Capital Expenditure Justification Criteria and NS Power's Financial Policies and Procedures.

On an annual basis NS Power requests UARB approval for the Program and its component Routines through NS Power's ACE Plan. Within the approval request further context and justification is provided to support the annual funding levels of the Routines. This information includes specific project budget details, historical trending and year over year variances.

15.2 Definition

Routines include recurring annual capital expenditures for:

- Replacement of worn out or technologically deficient stand-alone equipment.
- Additions/improvements to existing capital assets to raise or improve productivity levels and asset value.
- Additions to existing equipment base resulting from system growth.
- Addition of customers to the system.

15.3 Unit Cost Materiality Limits

The threshold for capitalizing smaller asset purchases is to be consistent with the materiality limits contained in the financial policies. Expenditures for amounts less than the stated capitalization limits should be charged to operations as they are incurred, regardless of the volume purchased.

Exceptions:

Where smaller components are implicit within the scope of a capital project they will be capitalized as part of the overall project.

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IT Infrastructure:

NS Power's computer platforms are made up of the following components:

- Keyboards
- Monitors
- Docking stations
- Peripheral communication devices
- Desktop and laptop computers
- Software
- Licenses
- Servers
- Networks
- Data Storage

Each of these assets is integral to the operation of the computer systems which allow employees to perform their daily work functions. NS Power's annual IT capital investment allows for the periodic refresh of certain components to ensure that each platform is functioning at its intended potential. As these purchases are included in and required to ensure the adequate performance of each employee's computer system, the investments will be capitalized.

15.4 Routine Classification

Routines are classified into four functional categories:

- Generation
- Transmission
- Distribution
- General Plant

The Routines included in the Program are as follows:

Generation Routines

Generation Equipment Replacements
Generation Other Hydro
Generation Other Thermal

Transmission Routines

Transmission Substation Replacements, Additions, Modifications
Primary Equipment Spares
Protection Modification & Replacement
Transmission Line Replacements, Additions, Modifications

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Distributions Routines

Meters
Distribution Upgrades and Replacement
New Customers
Joint Use
Right-of-Way Widening

General Plant Routines

Work Vehicles
Tools and Test Equipment
Telecommunications
Computing Asset Management
Property Improvements and Furniture
Other

15.5 Approval

Routines are provided for Board approval on an annual basis through the ACE Plan. As part of the ACE Plan proceeding, stakeholders are provided the opportunity to evaluate each Routine. If a new Routine is required, NS Power will file for Board approval of the Routine prior to or by including it in the ACE Plan. If there are new projects added to an existing Routine, NS Power will identify the projects within the ACE Plan documentation.

Over-expenditure

Please refer to section 12.2.

Limits

All individual expenditures are tracked separately within the routine.

Routine Expenditure Reporting

The Board is kept apprised of the actuals incurred during a given year through the ACE Plan process and in the Q4 capital reports provided to the Board.

Projects within Routines

Descriptions of the individual routine projects included in NS Power Routine Program are provided in **Appendix A**.

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16.0 Confidentiality

Where the above documentation packages provide confidential information (e.g. commercially sensitive information such as vendor quotes, cost estimates, and internal procurement recommendations; proprietary third party information such as consultant reports and standards documentation; and security sensitive information such as transmission one-line diagrams), NS Power will justify and request the Board, in accordance with Rule 12 of the Board's Rules, maintain portions of the capital filings as confidential. NS Power will minimize such requests for increased transparency and to support the Board's objective in issuing transparent, non-confidential, public decisions.

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17.0 Capital Expenditure Justification Criteria

17.1 Introduction – General Considerations

The following considerations are used to evaluate the economic justification for procurement and replacement of equipment, materials and services on the NS Power system.

- Examination of basic needs and alternatives (e.g. why is this required, why now, what other options are available, what are the consequences of doing nothing?).
- Examination of suitable technologies to provide an appropriate solution(s).
- Evaluation of alternative means of acquiring technologies including: design and build NS Power owned facilities and provide services using NS Power staff; rent or lease facilities and provide services using NS Power staff; rent or lease facilities and contract to others for services; and variants of the above as appropriate.
- The alternatives will be ranked using the most appropriate measure (e.g. Revenue Requirement or Net Present Value (NPV)), and the best alternative will be chosen (i.e. lowest Revenue Requirement or highest NPV or lowest Net Present Cost, etc.)
- Capability to meet industry norms for performance, such that NS Power's ability to provide its customers with the required levels of service are not compromised.
- Obsolescence and/or lack of support from facility, spare parts and service suppliers, such that NS Power incurs unacceptable risk of financial loss and/or liability.
- Ability to provide the lowest overall operating costs to NS Power.
- Required to ensure compliance with NPCC and, or NERC Reliability Standards.

The least cost option meeting the requirements and constraints specified above shall be selected.

17.1.1 Integrated Resource Plan

An Integrated Resource Plan (IRP) assesses various supply and demand scenarios to determine the best ways for NS Power to meet future requirements (including emission standards) in a cost-effective and reliable manner, while maintaining a minimum 20% capacity reserve margin above firm loads. The IRP is an important resource document used in the development of the capital plan.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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NS Power's IRP is:

- A strategic document;
- A planning document that helps NS Power and governing bodies create long-term sustainable plans based on in-depth analysis;
- A result of broad consultation with stakeholders;
- A roadmap that outlines the primary demand and supply options to be used by NS Power to meet future electricity and emission requirements;
- An analysis framework that integrates demand and supply options to meet future electricity requirements reliably and cost effectively in compliance with current and emerging operational and environmental constraints;
- A reference against which to assess demand and supply-side applications;
- A living document that will be updated as conditions change materially; and
- Developed using models that incorporate the best information available at the time of planning, as well as predictions about potential decisions that are subject to change as societal and technology priorities evolve.

NS Power's IRP:

- Is based on current information about basic assumptions;
- Sources include:
    - Recognized experts and consultants
    - UARB staff and UARB consultants
    - Proprietary information sources
    - Publicly available trends
    - Stakeholders / suppliers
    - NS Power's professional experience and judgment;
- Has a 25-year planning horizon;
- Provides ranges of realistic values based on current information.

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NS Power's IRP is not:

- An application for UARB approval of specific NS Power initiatives;
- A commitment by NS Power to undertake specific initiatives;
- A prohibition against specific third-party initiatives; or
- A review of regulatory or accounting treatment for NS Power assets or costs.

17.2 Innovation

General

The electricity industry, along with customers' needs and expectations, is changing. It is subject to governments mandating increasingly stringent environmental legislation and regulation; increased adoption of distributed energy resources; and increased participation in feed-in-tariff programs, also implemented through government policy. All of these impact the delivery and affordability of electricity to customers. This is changing the way in which electric utilities generate and deliver electricity.

These developments require proactive and timely adaptation by electric utilities, so that they can continue to provide safe, reliable and affordable electricity to customers in a way that adapts to the changing electricity landscape and the evolving expectations of customers. This means doing things in new ways, so adaptation, by definition, requires utilities to invest in, test, and deploy non-traditional, innovative technologies.

In some cases, the efficacy of these innovative technologies is subject to many variables including region-specific application, and therefore can only be determined through their practical application locally via corresponding capital investments and demonstration projects. These must be pursued to develop core knowledge of the technology, and determine whether they will lead to feasible long-term solutions.

These innovation projects assist with the determination of whether certain innovative capital investments will achieve customer value in the future. The value of these demonstration projects goes beyond the deployment and use of the capital assets by providing data and learnings, allowing for testing before deploying at scale, or aiding in the development of business cases, where applicable.

For greater certainty, this category applies to capital projects that are responsive to the above evolution of the electric system. Innovation projects justified under this criterion will propose to use innovative technologies or use established technologies in innovative ways. Innovation projects are not projects that propose incremental upgrades or improvements to established

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technologies, except to the extent that such upgrade or improvement involves innovative technologies or use of established technologies in innovative ways.

Justification Criteria

Innovation capital projects are justified on the basis that there is a reasonable expectation that they will provide customer value in some or all of the areas of reducing upward pressure on revenue requirement, reliability and grid stability, government policy compliance, and customer experience, through the deployment of proven technologies in innovative ways. In addition, innovation capital investments may be justified on the basis that they are reasonably expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable.

Sub-Justification Criteria

Innovation capital projects may be justified under one or more of the following sub-criteria:

- reduce upward pressure on revenue requirement
- reliability and grid stability
- environmental and other compliance
- customer experience improvements

Reduce Upward Pressure on Revenue Requirement

Capital investments under this sub-criterion may contribute to understanding how emerging impacts to NS Power's system may affect revenue requirement, or reduce upward pressure on NS Power's revenue requirement. This reduction can be achieved a number of different ways, including by increasing fixed costs contributions, decreasing operational costs, decreasing capital investment, decreasing fuel cost, or increasing the output of cost effective forms of renewable generation.

Innovation capital projects justified under reducing upward pressure on revenue requirement must (1) be reasonably expected to reduce upward pressure on revenue requirement, based on known issues increasing pressure on revenue requirement, through the deployment of proven technologies in innovative ways; or (2) be reasonably expected to allow for testing before deploying at scale, provide valuable data and learning, or aid in the development of business cases where applicable, regarding the efficacy of innovation technology in reducing upward pressure on revenue requirement.

Reliability and Grid Stability

Intensifying weather events, customer reliance on electricity and service expectation, and decreasing power quality caused by increasing wind and solar generation, are all creating reliability and grid stability challenges that are difficult to address with traditional grid

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technologies and practices. Capital investments under this sub-criterion may mitigate these issues by allowing NS Power to test new technologies and techniques which may allow further integration of solar, wind and other impactful technologies without compromising system stability and potential growth, as well as ways to reduce outage frequency or duration through the incorporation and optimization of technologies such as grid automation, electricity storage, distributed generation and energy management technologies.

Innovation capital projects justified under reliability and grid stability must (1) be reasonably expected to improve reliability and grid stability, based known issues affecting the same, through the deployment of proven technologies in innovative ways; or (2) be reasonably expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable, regarding the efficacy of innovation technology in improving the reliability of the system.

Environmental and Other Compliance

The Nova Scotia Renewable Energy Standards provide that 40 percent of NS Power's generation must come from renewable resources starting in 2020. Moreover, NS Power must comply with four air emission hard caps for CO2, NOx, Hg, and SO2, and potential future federal cap and trade requirements. Capital investments under this sub-criterion may contribute to achieving these renewable generation and emissions requirements through the testing or deployment of innovation technologies such as battery storage, which can store excess variable renewable energy to be utilized when the renewable resource is not producing energy.

Innovation capital projects justified under environmental and other compliance must (1) be reasonably expected to support environmental or other compliance, based on environmental compliance or other legislation and regulation, through the deployment of proven technologies in innovative ways; or (2) be reasonably expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable, regarding the efficacy of innovation technology in complying with environmental or other policy.

Customer Experience

Rapid advances in technology, the offerings customers receive from other service providers, and the availability and control of information 24 hours a day are driving changing customer expectations. As customer expectations continue to evolve, using innovative technologies in new ways may contribute to meeting them. Customer experience projects are driven by the reasonable expectation they may lead to improvements to customer experience exclusive of other justifications, but may also provide benefits under the other sub-criterion noted above.

Innovation capital projects justified under customer experience must (1) be reasonably expected to improve the customer experience, based on either stated or predicted needs of customers, through the deployment of proven technologies in innovative ways; or (2) be reasonably

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expected to allow for testing before deploying at scale, provide valuable data and learnings, or aid in the development of business cases where applicable, regarding the efficacy of innovation technology in improving the customer experience.

17.3 Health & Safety

NS Power conducts all of its business in a manner which is both health and safety conscious. Health and/or safety are one of the many reasons why a capital expenditure might be required. In cases where health and safety is not the principal justification for the project and other criteria (e.g. pole retreatment, transmission plant replacement etc.) are used to justify the project, health and safety is not used as sub-justification criteria even if health and safety is a secondary driver for the project.

This criterion applies to capital projects undertaken to comply with applicable laws and accepted industrial practices, including but not restricted to:

- Nova Scotia Occupational Health and Safety Act and Regulations
- NS Power standards and work practices
- Orders issued by the N.S. Department of Labour, or Environment
- Accepted industrial practice or codes
- Exercise of due diligence

As well as applying to active NS Power sites, the Health and Safety criterion is applicable to temporarily or permanently decommissioned NS Power sites. Examples of such expenditures include the following:

- Demolition of physical plant to eliminate all liability
- Alterations to a site or physical plant to render it secure against public intrusion in order to limit liability (e.g. Signage, fencing, boarding of windows and doors, electrical isolation, etc.)
- Security devices to alarm intruders
- Alterations to a site or physical plant in preparation for sale or disposal

Projects where compliance with such requirements is the primary driver for the investment will utilize the Health and Safety justification criteria. There are often projects where other (discretionary) asset management criteria may be major drivers in addition to Safety improvements that will be accomplished through a capital upgrade. The intent is to code the project to its primary driver but judgment is often required to ensure consistency.

17.4 Environment

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As an industrial enterprise, NS Power is obligated to act in a manner which is respectful and protective of the environment in accordance with Company policy, environmental legislation and regulations and agreements with governments. Subsequent to appropriate analysis of its existing and proposed operations, NS Power may need to make capital expenditures to achieve the required environmental performance. NS Power is committed to an environmental ethic which supports environmental and economic sustainability.

The environmental justification criteria include the following:

Environmental Permit, License, Regulation Criteria

These criteria refer to the specific law(s) and the enabling legislation which is enacted to provide for processes, project approvals, environmental monitoring, and standards of performance.

Resulting from regulations, laws and legislation are instruments which require a certain level of environmental performance. They can significantly impact capital expenditures.

These instruments are:

- permits
- licenses
- regulations

NS Power's capital expenditure criteria will include justification based on the type of instrument placing the requirements.

Environmental Agreement, Guidelines, International Standards and Voluntary Action Criteria

These criteria respond to agreements between governments, government guidelines, international standards developed for various industrial sectors and voluntary action that bind the owner/operator to carry out its business in a certain way so as to meet agreed environmental performance.

These instruments may be more flexible than those described in section 1.0 above. However, there is usually little choice given the expectations of performance under international trade agreements. These agreements have provisions which can be used to punish and/or reward industries, economic sectors and countries based on environmental performance.

NS Power's capital expenditure criteria will include justification to make such an expenditure by reference to the specific instrument in question.

17.5 Land and Right-Of-Way

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NS Power needs to occupy and access land to enable the Company's operations. Land can be held as a fee simple title or through some other interest or type of right over land. Fee simple ownership is normally taken for facilities where permanent exclusive occupation is required, for example a thermal generating plant. Where these requirements are lessened in some way, NS Power can acquire interests which are less than the fee simple interest in land, including rights-of-way or easements for power lines, or utility corridors and leases or licences for the occupation of land.

Land and Rights owned by NS Power are managed according to their use, with the main distinction being between those in current use for company operations and those where there is no operational use. Sites without an operational use can be held to mitigate or protect adjoining operational uses, allow management of the remnants of past use, or to allow for future activities or to generate revenue.

The criteria governing NS Power land transactions are as follows:

Land Acquisition

Land is normally acquired as part of a capital project associated with the five year capital budget. Occasionally land that will satisfy the requirements of a future capital project that is beyond the five year capital budget will become available on the open market. In such instances the property may be acquired if no economically practical alternative property is available to satisfy the requirements of the future project in question.

Land Disposal

NS Power can dispose of, lease or grant rights over surplus land. Land associated with hydro projects is generally retained to protect the safety and usability of the whole system. Land to be disposed of will be investigated to ensure compliance with NS Power environmental criteria and provincial regulations.

Land and Building Disposal

A building, land or rights surplus to NS Power requirements and which can be sold will be sold with its associated lands assuming all environmental criteria have been met. If the land and building cannot be sold as one entity, then the building or facility will be removed or retired under NS Power retirement of capital asset criteria and, depending upon requirements, the land will be retained or sold.

Abandoned Rights-of-Way

NS Power normally retains rights-of-way which are not in current use to allow for future use. If a right-of-way is determined to be surplus to NS Power requirements, then the right-of-way may be released, usually to the owner of the property over which the right-of-way exists.

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17.6 Hydro, Wind and Biomass

The principles set out hereunder shall be used by NS Power in determining the methods used and timing of purchase and replacement of its hydro, wind and biomass production assets.

These production assets shall be purchased, replaced, or modified for any of the following conditions:

- To eliminate conditions which, in the opinion of NS Power, constitute hazards to operating personnel or the general public.
- To meet NS Power's obligations to third parties or to conform to applicable laws and regulations - including Nova Scotia's Renewable Electricity Standards and Canadian Dam Safety Guidelines.
- To produce an economic benefit by reducing or minimizing operating costs, or improving generating equipment efficiency.
- To maintain reliability and quality of supply to the bulk power system.
- When the probability of failure is high enough that:
    - Making the proposed capital investment reduces the costs compared to continuing to repair the existing asset;
    - The estimated cost reduction is of significant magnitude to meet NS Power's financial criteria; and
    - The timing of investment is optimized to maximize customer net benefits.

Hydro - Economic Justification Procedure

The following procedure is used to evaluate replacement, refurbishment or upgrades to NS Power's hydro production assets.

The least cost option meeting all the requirements and constraints specified shall be selected.

- Wood stave pipelines shall be replaced when an engineering assessment indicates a high risk of failure exists. The engineering assessment takes into consideration near end of life annual inspection reports, stave sampling (where appropriate), performance reports (leakage and stave failure) and risk assessment.

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- Turbine runners shall be replaced on the basis of runner degradation or potential efficiency improvements. Turbine runners under consideration for replacement due to runner degradation will be based on a qualitative and quantitative assessment following annual inspections. An engineering analysis will examine potential improvement for efficiency improvement.

- Capital improvements and replacement of dams and hydraulic structures will be initiated where formal engineering investigation and risk assessment find that the structures do not comply with accepted national standards of stability and flood management capability for existing structures, or where accepted criteria of "due diligence" for public and environmental safety cannot be met.

- Generator stators will be rewound when there is a high probability of insulation failure or when failure has occurred. All generation station windings are tested under a regular inspection program. Units having older type insulating materials or those whose windings are exhibiting insulation deterioration are tested annually. The tests provide insulation resistance values, dissipation indices and polarization indices. Station winding replacement is justified taking into consideration measured test values, age, type of insulating material and trends in insulation performance suggested by test results.

- In all instances, it must be demonstrated that the value of energy to the system is greater than the cost of the capital project in question or the next most cost effective renewable energy option to replace the hydro generation. The latter is required to ensure NS Power remains compliant with Nova Scotia's Renewable Electricity Standards.

17.7 Thermal

The principles set out hereunder shall be used by NS Power in determining the methods used and timing of purchase and replacement of its thermal production assets.

Equipment Replacement/Refurbishment

Capital expenditures to purchase, replace, or refurbish equipment must be justified by an engineering and economic evaluation which incorporates information from planned inspection/performance programs and industry standards. An economic analysis is carried out such that the least cost option meeting all the requirements and constraints specified shall be selected.

Thermal production assets shall be purchased, replaced, or modified when the probability of failure is high enough that:

- Making the proposed capital investment reduces the costs compared to continuing to repair the existing asset;

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- The estimated cost reduction is of significant magnitude to meet NS Power's financial criteria; and

- The timing of investment is optimized to maximize customer net benefits.

Heat Rate

For capital expenditures resulting in Unit heat rate improvements, an annual cost saving is calculated using the system dispatch production models (i.e. production costing model) (for major improvements) or calculated on a BTU/kWh basis using current production forecasts and current cost of fuel forecast (for minor improvements < 1% improvement in heat rate).

Capacity

For capital expenditures that result in an increase in net Unit capacity, the value of a kW is calculated using system planning models.

Labour

Impacts on present or future labour requirements are calculated on an annual savings/cost basis taking overtime and fringe benefits into account.

Forced Outage Rate

Unplanned outages result in replacement generation, often at a higher cost than the existing generation. These costs are estimated using the probabilistic production model and incorporated into the Economic Analysis Model.

17.8 System Design

Nova Scotia Power's transmission system is divided into several classifications, each of which is governed by different design criteria.

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These classifications are as follows:

- Primary Transmission
- Secondary Transmission
- Electrically Remote Transmission
- Transformation

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NS Power is a member of the Northeast Power Coordinating Council (NPCC). Those portions of the NS Power Bulk Power System, wherein single contingencies can potentially adversely affect the interconnected NPCC system, are designed and operated in accordance with NPCC Directory #1, Design and Operation of the Bulk Power System.

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NS Power is required to follow the standards of the North American Electric Reliability Corporation (NERC). NERC is a non-government organization which regulates Bulk Power System users, owners, and operators through the adoption and enforcement of standards for fair, ethical, and efficient practices. NERC standards are filed with the UARB through a regulatory approval process where they become mandatory and enforceable in the province of Nova Scotia. NS Power designs its Bulk Electric System to meet the requirements of the in-force NERC standards. NS Power utilizes a set of criteria for its transmission system that combines protection performance specifications with system dynamics and steady state performance requirements. The NS Power Bulk Electric System is planned, designed, and operated in accordance with single contingency criteria.

NS Power System Design Criteria are applied for all other portions of the interconnected system.

NERC standards and NPCC criteria are continually evolving. NS Power system design practices are constantly updated to meet the requirements of new and evolving standards.

The System Design criteria are provided and maintained in report #NS Power-TPR-003-6. The current version of this report is provided in Appendix C.

Definitions

Primary Transmission is defined as 230kV and above and any other NPCC Bulk Power System transmission.

Prime clearance times are defined to be 4 cycles first zone and 6 cycles second zone with permissive signal for both three-phase and line-to-ground faults.

Back-up clearance times are defined to be 12 to 16 cycles for both three-phase and line-to-ground faults.

Secondary Transmission System includes all other transmission facilities which are not included in the Primary Transmission nor the Electrically Remote Transmission categories.

Prime clearance times are defined to be 6 cycles first zone and 8 cycles second zone with permissive signal for both three-phase and line-to-ground faults.

Back-up clearance times are defined to be 14 to 18 cycles for both three-phase and line-to-ground faults.

Electrically Remote Transmission is defined by the buses at which the maximum fault levels do not exceed 1000 MVA three phase.

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Deleted: the 345 kV transmission system interconnecting Lakeside-Onslow-Hopewell-Woodbine and Salisbury, New Brunswick, the 230 kV transmission system interconnecting Brushy Hill-Onslow-Lingan-and Pt. Aconi, Nova Scotia and the interconnecting 345/230 kV transformation between them

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Deleted: is defined to be that part of the system which serves mainly to interconnect miscellaneous generation and Primary Transmission with Subtransmission at major load centres

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¶
Local back-up clearance is defined to be less than 30 cycles (a figure of 20 cycles is desirable but where coordination so dictates, a 30 cycle figure is acceptable).¶
¶
Remote back-up clearance is defined to be less than 30 cycles which in certain instances implies reduced margins of coordination.

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Prime time clearance is defined to be 9 cycles for both three-phase and line-to-ground faults.¶

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¶
Interconnected Transmission System is defined as the combined Primary, Secondary, and Electrically Remote Transmission systems including connected generation.¶

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Normal system conditions are defined to include all of the following:

- Expected load conditions,
- All transmission facilities in service (no line or transformer maintenance).
- Economically scheduled and dispatched generation allowing for planned generator maintenance outages (non-firm generation is not included as economically dispatched generation). Economic dispatch may be influenced by environmental or regulatory restrictions.
- Stable steady-state operation of the Interconnected Transmission System.
- All system voltages within 95% to 105% of nominal, unless otherwise noted.
- All system elements operating within their continuous thermal ratings, unless otherwise noted.

A system element is defined to be any one generator, transmission line, transformer or bus section.

Breaker back-up is defined to be protection against a local breaker's failure (mechanical or electrical) to trip when initiated by an associated protection operation.

17.9 Transmission Plant

The principles and criteria set hereunder shall be used by NS Power in determining the methods used and timing of purchase and replacement of its transmission plant.

Conditions for Purchase

Transmission plant shall be upgraded, rerouted, or otherwise modified for any of the following conditions:

- To eliminate conditions which, in NS Power's opinion, constitute hazards to operating personnel or to the general public.
- To meet NS Power's obligation to third parties or to conform to the provisions of applicable laws and regulations.
- To reduce or minimize operating costs of the transmission system.
- To maintain reliability and quality of supply to the distribution bus.

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Local back-up clearance is defined to be the time to clear an in-zone fault.¶
¶
Remote back-up clearance is defined to be the time to clear an out-of-zone fault.¶

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Conditions for Replacement

Transmission plant shall be replaced, if still required to meet system design requirements, as follows:

- Transmission poles which fail the test for resistance to overturning moment in accordance with Transmission Maintenance Practice TMP 475C.1.
- Certain insulators with cemented joints are failing due to the composition of the cement used in the manufacture of the insulators. The manufacturers of the insulators are no longer in existence. These insulators include:
  - Suspension insulators in strain positions.
  - Pin type insulators manufactured with two or more parts of porcelain cemented together.
  - Cap and pin insulators manufactured with two or more parts of porcelain cemented together.
  - Multicone insulators.
  - Suspension insulators in tangent positions when a history of failure has been established by outage statistics.
- Substation apparatus which fails or is predicted to fail due to; insulation degradation, out of calibration or capacity limitation. Apparatus is inspected and tested at regular intervals to ensure reliability of purpose, security of the electrical system, and safety of operating personnel and general public. Programs for determining the current and predicted performance are as follows:
  - Substations are visually inspected every month.
  - Insulating oils are tested every year.
  - Other insulations are tested every four to six years.
  - SF6 interrupters are tested every eight years and oil interrupters are tested every six years.
  - NPCC protection is tested every two years.
  - Batteries are visually inspected every year.

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- Insulation degradation as confirmed by internal testing; intervals varying by equipment and performance and asset age.

Transmission Plant Replacement - Economic Justification Procedure

The following procedure will be used to evaluate the replacement, modification or upgrade of Transmission Plant at NS Power:

- Any transmission plant which fails or is predicted to fail will be evaluated firstly as to NS Power's current and future requirements.
- An economic evaluation will then be completed such that the least cost option meeting all the requirements and constraints specified shall be selected. Included in these alternatives will be the costs to:
  - Repair the transmission plant to such a state as to meet NS Power's requirements.
  - Upgrade or modify other transmission plant so as to eliminate NS Power's requirement for the plant in question.
  - Replace the transmission plant as to maintain NS Power's transmission system.
- Any repairs, upgrades or modifications will be costed as per the manufacturer's and NS Power's specifications and standards. The costs for completing this work will include and compare NS Power's costs and/or manufacturer's operating and maintenance labour, material, expenses, shipping and all other relevant costs or factors which may affect these costs (i.e. availability of labour, material, revenue, etc.).

17.10 Distribution System

Nova Scotia Power's Distribution System connects the majority of NS Power's customers to the Transmission System. (Some of the larger customers are supplied directly from the transmission network.) As such the Distribution System criteria bridge the gap between the Transmission System and the customer's service entrance. The need for distribution projects is driven by the criteria provided below.

Requirement to Serve

The provision of electrical service to customers, as well as street lighting and other unmetered services is a requirement of NS Power. The least cost option to extend the system will be undertaken unless the customer requests to contribute the incremental cost difference. Extension of service will conform to the latest version of the NS Power Rates, Regulations and Procedures Manual.

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Pole Strength Compliance with Standard CAN/CSA-C22.3 No. 1-10 - Overhead Systems

Principles and Criteria for Replacement of Distribution Pole Lines

- The principles and criteria set out hereunder shall be used by NS Power in determining the methods used and timing of replacements of its distribution poles lines.
- Conditions for change or replacement:

  Pole lines shall be replaced, upgraded, rerouted and otherwise modified for any of the following purposes:

  - To eliminate conditions which, in NS Power's opinion, constitute hazards to operating personnel or to the general public.
  - To meet NS Power's distribution planning criteria.
  - To meet NS Power's obligation to third parties or to conform to the provisions of applicable laws and regulations thereunder.
  - To minimize distribution cost in the absence of any requirement to alter the distribution system under the provisions noted above.
- Criterion for select pole replacement:
  - Poles found to fail the test for resistance to overturning moment, as set out in the NS Power report entitled, "Distribution Line Inspection Procedures and Pole Replacement Criteria", 1993-09-28, shall be replaced. It is noted that the specified criterion is based on existing CSA standards.
  - Where a pole is found to fail the stated strength test, it shall be replaced immediately if, in the opinion of NS Power, it constitutes a hazard to operating personnel or the general public. Otherwise, it shall be replaced in a least cost manner.
  - Under least cost planning, an option involving timing of replacements which differs from that obtained by application of a distribution planning study may be found to provide the minimum cost. In this case, if hazards are not incurred, the global minimum shall be selected.

Service Voltage Outside CSA Standard CAN3-C235-83 (C2010)

CSA sets national voltage level standards at customer's service entrance, utilization

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points, and the point of sale to a municipal utility.

When it is determined from measurement or computer models that the voltage will be over or under these standards then various alternative solutions to these problems will be identified and the least cost option meeting all the requirements and constraints specified shall be selected.

- Service Voltage Outside Standards - Economic Justification Procedure

  The following procedure is used to evaluate alternative solutions to correcting voltage conditions to CSA Standards on the Nova Scotia Power Inc. distribution system.

- Local Voltage

  For local voltage issues the costs are identified to determine a least cost solution. These costs include: relocating the single phase transformer tap to another phase, replacing a transformer with a larger size, relocating the transformer closer to the load, reconductoring secondary on service conductors, other similar options. All costs are included for labour, material, expenses, interest, removal and salvage. These costs are totalled in current year dollars and represent the costs to resolve local voltage problems.

- Feeder/Substation

  For feeder or substation issues relating to low voltage the costs are identified to determine the least cost solution. These costs include: adjusting regulator settings, addition of line regulators, addition of shunt capacitors, reconductoring, conversion of the system in question to a higher voltage, addition of another feeder, addition of a substation or other unforeseen options. All costs are included for labour, material, expenses, interest, removal, salvage, losses, maintenance, and any other related costs. These costs are totalled in current year or present worth dollars, and represent the costs to resolve feeder/substation voltage problems.

Overloaded Equipment

- Transformers

  Transformers used as step-downs from one primary voltage to another are considered to be overloaded when they have reached a peak load in excess of 133% of their top nameplate rating. If the transformer load peaks in the summer and has a high daily load factor, a criteria of 110% top nameplate rating is used. Padmount and vault installed transformers should be loaded according to DEP 3.03 "Loading Guide - Padmount

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Transformers".

"Single Phase Transformer Capacity Selection Chart for 120/240V Domestic Services" T-1, from "Overhead Distribution Standards Manual" should be used for pole mounted transformer loading.

- Cables and Overhead Substation Exits

  Cables or overhead distribution feeder circuits emanating from a supply substation will be considered to be overloaded when the peak load exceeds 325 amps or thermal capacity whichever is less and transfer capability with adjacent feeders has been fully utilized.

  In addition, cable ratings for normal and emergency conditions should be determined by reference to the "Underground Standards Manual".

- Conductors

  Overhead conductors are considered to be overloaded when they have reached the loadings as per the report "Conductor Current Carrying Capabilities" and the "Overhead Distribution Standards Manual".

  Variables considered were: conductor resistance, dissipation, wind velocity, atmospheric pressure, emissivity, etc. In addition, a conductor carrying a current of 325 amps is considered to be at its load limit.

- Equipment

  Equipment, such as reclosers, regulators and switches are considered to be overloaded when they exceed their continuous current rating as provided by the manufacturers.

- Overloaded Equipment - Economic Justification Procedure

  The following procedure is to be used to evaluate alternative solutions to correct overloading equipment problems on the Nova Scotia Power Inc. distribution system.

  For overloading equipment problems the costs are identified such that the least cost option meeting all the requirements and constraints shall be selected. These costs include: replacing the equipment in question with higher rated equipment, reduction in load by reconfiguring the power system, converting to a higher voltage for equipment other than transformers and other unforeseen options. All costs are included for labour, material, expenses, removal, salvage and any other related costs. These costs are totalled in current year or present worth dollars, as appropriate, and represent the cost of resolving the overloaded equipment problem.

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Deteriorated Conductor

Overhead conductor shall be replaced on the basis of:

- deterioration sufficient to constitute a safety risk to powerline technicians or the public at large;
- deterioration sufficient to result in an unacceptable level of outages to customers;
- least cost economics.

It is sufficient justification for replacement that the conductor fail to meet any one of the criteria outlined below.

The criteria that establish the basis for conductor replacement are as follows:

- Powerline Technician Safety - Live Line Procedures

  When safety considerations for live line procedures as per the NS Power Safety Manual are evaluated, they shall be based on evidence of conductor deterioration as established by 5.2, or 5.3 but may include other factors permitted by the NS Power Safety Manual when assessed by a fully qualified powerline technician assigned to the job. If the conductor is deteriorated to the extent that it is not deemed safe to work live then conductor replacement would be considered in conjunction with the earliest pole replacement program on that line.

- CSA Safety Standard

  When tests indicate that the conductor tensile strength for conductors size #2 and larger has deteriorated to less than 60%, or for conductors sized #4 and smaller has deteriorated to less than 80% of the ultimate tensile strength specified for design loading conditions as stipulated in CSA Standard C22.3 NO. 1-10 "Overhead Systems". (Note 1) Testing to support this recommendation will be conducted on representative samples of conductor.

- Lineworker Safety - General Linework

  When tests indicate that the torsional ductility of individual supporting strands of the conductor is reduced below 4 turns when tested according to ASTM Standard E558-83 "Standard test method for torsion testing of wire" for a test conductor length of 120 wire diameters. (Note 1) Testing to support this recommendation will be conducted on representative samples of conductor.

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- Economics

  At times it is economical under least cost planning to establish an earlier replacement date. The economic analysis will include the value of energy losses in combination with other significant operating cost considerations (e.g. maintenance and customer costs due to outages) for the existing conductor as compared with the capital and operating costs of the replacement conductor. The economics will be calculated over the remaining life of the conductor which will, in the absence of more specific information, be established by evaluating the point in time when it will fail to meet technical requirements such as electrical load, voltage, protection or conductor strength.

- When direct measurement shows loss of the galvanizing coating on the reinforcing strands over a significant portion of the circuit. Conductor replacement will be planned on the basis of predicted remaining life as established from experienced deterioration rates.

  Note 1 - A database of conductor test results will be established. This database will be analysed to support the longer term objective of developing additional, cost-effective conductor replacement criteria founded on direct observation of specific characteristics of the conductor that pertain to its life expectancy. These will include, besides the test results, the conductor type, age, aggressiveness of environmental conditions at installation site (or distance from coast) failure history and splices per conductor per km.

Outage Performance

In evaluating methods of achieving reliability targets, analysis of the interruption data will be undertaken annually to direct the spending in the areas which will have the greatest impact on provincial reliability without sacrificing the regional reliability to a level below that warranted by the customer density. Transmission as well as distribution alternatives will be coordinated.

Distribution System Protection

The protection of the distribution plant and public and employee safety is provided in Distribution Engineering Practice "6.02 Overcurrent Protection Guidelines". The specific objectives of the criteria are to:

- Protect electrical plant from thermal and electromagnetic damage which can be caused by excessive current flow.

- Limit hazards to public and operating personnel.

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- Maintain service continuity to customers through the selective coordination of overcurrent devices.

Distribution System Protection - Economic Justification Procedure

The following procedure is to be used to evaluate alternative solutions to protection problems on the Nova Scotia Power Inc. distribution system.

For protection problems the costs are identified such that the least cost option meeting all the requirements and constraints shall be selected. These costs include: addition of protective devices, uprating protective devices, reconductoring, addition of phases, converting to a higher voltage, reconfiguring the power system, addition of a feeder, addition of a substation, increase a substation transformer or other possible unforeseen options. All costs are included for labour, material, expenses, interest, removal, salvage, maintenance, losses and any other related costs. These costs are totalled in current year or present worth dollars and represent the costs to resolve distribution system protection problems.

Prevention of Catastrophic Failure of Distribution Transformers/Capacitors

Maximum symmetrical fault levels of 8000 amps at 24.94 kV and 9000 amps at 12.47 kV govern the Distribution System design. In addition to these levels, so as to prevent catastrophic failure, distribution equipment subject to symmetrical fault levels exceeding 4000 amps at 12.47 kV and 3000 amps at 25 kV should be protected by current limiting fuses as outlined in Distribution Engineering Practice 5.30.

Grounding Criteria

Grounding of the distribution system should ensure that the system neutral to ground (earth potential)[2] shall not exceed 10 volts. Methodology is contained in the "Overhead Distribution Standards Manual", Section G - Relocation.

- Grounding - Economic Justification Procedure

To reduce the earth potential the costs are identified such that the least cost option meeting all the requirements and constraints shall be selected. These costs include: insuring the neutral integrity, addition of grounding, reducing current flow, increasing size of neutral conductor, adding phases or other unforeseen options. All costs are included for labour, material, expenses, interest, removal,

[2] Ground or earth refers to the reference point in an electrical circuit from which other voltages are measured, or a common return path for electric current, or a direct physical connection to the Earth.

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salvage, outage costs and customer outage costs as well as any other related costs. The costs are totalled in current year dollars and represent the cost of fixing a grounding problem.

Joint Use Agreement

Expenditures required in accordance with our Joint Use Agreement with Bell Aliant. This agreement is established to reduce costs to both NS Power and Bell Aliant customers, by sharing poles.

Highway Relocation

Poles located on highway, city street, town and municipal rights of way are installed based on pole permits and must normally be relocated at NS Power's cost when requested by the right-of-way owner.

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Radio Interference Voltage

The Radio Interference Regulations under the Radio Communication Act Chapter 1374 regulate the radio noise limits being emitted from our distribution lines. Alternative methods of reducing noise involve tightening hardware or replacing insulators or other similar methods.

Voltage Unbalance

Expenditures may be required due to violation of the criteria outlined in DEP 5.50 "Distribution Feeder Balancing" on NS Power's system.

Alternative methods of solving this problem would include phase current balancing, addition of phases, replacing conductor.

Voltage Flicker Due to Motor Starting

Allowable flicker is governed by DEP 3.04 "Voltage Flicker Due to Motor Starting".

Flicker caused by customer equipment should be mitigated by the customer with NS Power solutions requiring contribution from the customer such as reconductoring, voltage conversion, new feeders, new substation, etc.

CATV Agreement

CATV contracts with various Cable Television companies throughout Nova Scotia govern our expenditures.

17.11 Pole Retreatment

The principles and criteria set out hereunder shall be used by NS Power in determining the methods used and the timing of retreatment of its transmission and distribution wood poles.

Conditions for Retreatment

Wood poles originally treated with pentachlorophenol and creosote preservatives shall be retreated with approved wood preservatives to reinforce the preservative retention levels in the ground line area thereby maintaining acceptable toximetric thresholds necessary for protection against fungal and insect attack.

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Criteria for Wood Pole Retreatment

Wood pole species found on the transmission and distribution systems include various kinds of Pine, Douglas Fir, and Western Red Cedar. NS Power undertakes on a line basis, retreatment of those poles that have been in service for 15 years or more in the following manner:

- Transmission class poles are tested for resistance to overturning moment in accordance with Distribution Engineering Practice (DEP) 7.51.Poles found to have an effective circumference equal to or greater than the minimum required circumference and a shell thickness of 3 inches or more are scheduled for retreatment.
- Specified failure criterion is based largely on existing CSA standards for required pole strength and to some extent on utility industry practice.
- Some poles though meeting strength and treatment criteria may not be retreated due to various reasons. These include landowner requests, poles in proximity to agricultural lands or domestic gardens and poles inside water buffer zones established by the Nova Scotia Department of the Environment and included in the yearly ministerial permit.
- Appropriate personnel are informed of poles that fail criteria.
- All pole tests and retreatment data will be maintained on a computerized database for future reference.

Pole Retreatment - Economic Justification Procedure

The management plan for retreatment of transmission class poles is based on studies which consider the age, species, original treatment and structural integrity of the lines comprising the transmission system. NS Power carries out a pole retreatment program on transmission class poles. The least cost option meeting all the requirements and constraints shall be selected.

17.12 Metering Equipment

The principles and criteria set hereunder shall be used by NS Power in determining what types of metering equipment to purchase and timing of replacements.

Conditions for Purchase and Service

Metering equipment shall be purchased and placed into service under the following conditions:

- For revenue metering, NS Power purchases only those meters having Measurement Canada (MC) TYPE APPROVAL. These are the only approved apparatus for measuring AC energy and power in Canada, and upon whose readings a legal bill may be rendered by the supplier to the customer.

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- Meters are sealed by NS Power, or accredited verifier, to the Standard proclaimed in document S-E-02, "Specifications for Verification and Re-verification of Electricity Meters", before being placed in service. Meters are also brought in from active service on a periodic basis for re-verification according to this standard.

- Meters being purchased at the present time for kWh measurement will be of the standard type because these have been determined to be the most economic choice when all factors related to metering cost have been considered. The determining factor in this economic choice is the costs associated with meter re-verification.

MC allows selective sampling of standard induction type meters both in verification and re-verification. MC requires each register to be tested fully, as must any load control device, and the meter once sealed, cannot be updated electronically, unless the seal is broken at the meter shop and the whole calibration process repeated. The multitude of readouts causes delays in re-verification, and the special features required for Industry Canada TYPE APPROVAL makes these meters much more expensive on a unit for unit basis.

Conditions for Replacement

Metering equipment shall be replaced, upgraded or otherwise modified for any of the following reasons:

- When meters fail the criteria specified in the Standard, depending upon the economics (i.e. labour/material charges, availability of spare parts) of overhauling, and whether or not a directive to discard is received from MC, they are either repaired and returned to service or retired and replaced by new meters.

- When a rate class for a given customer changes, requiring a meter with greater or lesser capability.

Metering Equipment - Economic Justification Procedure

The following procedure is used to evaluate the replacement of meters on the Nova Scotia Power Inc. system.

- Any meter(s) which has been ordered to be discarded as a result of an order from Measurement Canada (MC) shall be replaced with a type approved by the MC.

- Any meters of a particular lot which are known to have a defect will require action. This may require a meter replacement or repair.

- An economic evaluation will be completed to determine the least cost alternative. Included in these alternatives are the costs to replace the meter, the costs to

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repair the meter at a NS Power facility, the costs to repair the meter at a manufacturer's facility. Included in these costs are labour, material, expenses, overhead, shipping and any other relevant costs.

- Meters which fail re-verification according to the document S-E-02, "Specifications for Verification and Re-Verification of Electricity Meters", shall be repaired or replaced. Appropriate action is taken based on the least cost alternative. In determining the cost to repair or replace the meter the expected life is calculated from standard electric utility depreciation practices.

17.13 Work Support Facilities

Building Facilities/Furniture

NS Power owns and operates buildings and associated systems, equipment and furniture to support the delivery of service to customers (i.e. other than that associated with generation facilities, the costs of which are included in the related function costs). These facilities are operated in a manner which provides the most suitable environment for employees to carry out their work in a safe and efficient manner and protects the asset and extends its original useful life.

Facilities may be constructed, replaced, upgraded, renovated, leased, retired or otherwise modified for any of the following purposes;

- To eliminate conditions which, in NS Power's opinion, constitute hazards to NS Power's personnel or to the general public;
- To meet NS Power's obligations to third parties or to conform with the provision of applicable laws and regulations there under;
- To protect facility assets by maintaining them in a reasonable operating condition;
- To comply with regulations and legislation.

Building Facilities/Furniture - Economic Justification Procedure

The following procedure will be used to evaluate the construction, replacement, renovation, modification or retirement of NS Power facilities. In all cases financial analysis will be conducted on the basis of least cost over the facility life cycle.

Facility Audits

- Periodic audits will be carried out on all facilities. These audits will identify any operating issues, deficiencies, inefficiencies, potential hazards, code compliance, or any

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opportunities for improvements to the facilities. Aspects examined will include the building structure, the electrical, lighting, mechanical (including heating ventilating and air conditioning), communications and safety systems, as well as interior appointments including finishes, furniture and signage. Examination of the grounds will encompass all aspects of the compound, any out-buildings and all environmental considerations.

- Capital work identified from these audits will be examined for its positive impact on the productivity and working conditions of employees, elimination of hazards, code and regulations compliance, or its ability to extend the life of the building asset. Applicable projects will be cost justified over the life of the building and all costs taken into account (labour, material, expenses, administrative overhead, interest and all other relevant costs).

- Furniture and equipment will be replaced on an equivalent and suitable basis when existing items are no longer serviceable or when safety or ergonomic issues dictate. Additions to inventory will be made on the basis of new human resource requirements or the support of a valid business case.

Building Replacement/Modifications

Capital projects which involve building replacements, new buildings, or the renovation or modification of a major portion of the building space will consider the following factors in the economic analysis when pertinent:

- Operating costs of the building (heat, lights, rentals, general maintenance, etc.)
- Relevant operating costs of the functions carried out by employees (e.g. travel time)
- Capital costs necessary to continue to operate the existing facility (e.g. roof replacement, code compliance)
- Effect on staffing levels (e.g. reduced staff due to reorganization or relocation)
- Construction costs (land purchase and preparation, building design, project supervision and management, temporary relocations, contractor costs, retirement of old facilities)
- Cost of preliminary investigation, study and engineering
- Relevant safety and environmental issues
- Long range needs (business requirements of the investment for the useful life of the asset)

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The least cost option meeting all the requirements and constraints specified above shall be selected.

Telecontrol & Telecommunications

The principles and criteria set hereunder shall be used by NS Power in determining the methods used and timing of procurement and replacement of its Telecontrol and Telecommunications facilities and services.

Definitions

- *Telecontrol Facilities* includes equipment which is used to provide supervisory control and data acquisition (SCADA), remote control, special protection systems and teleprotection.

- *Telecommunication Facilities* includes broadband transport mediums such as: fibre optics, microwave radio, UHF and VHF radio, metallic-pair cable, power line carrier, and systems which employ these mediums to transfer voice and data communications from one location to another such as: telephone, mobile radio, telecontrol equipment, computer networks, video, etc.

General

Telecontrol and telecommunications are essential for the protection and control of the Bulk Power System. They allow for remote monitoring and control of the power system through SCADA and provide for high speed protection of generation and transmission facilities through teleprotection and special protection systems (SPS). Telecontrol and telecommunications are also required to ensure compliance with Northeast Power Coordinating Council (NPCC) and the North American Electric Reliability Corporation (NERC) Reliability Standards. Telecontrol and telecommunication facilities are not used directly for the supply of electricity to NS Power customers. They are enabling technologies which help to satisfy NS Power's business requirements to serve its customers in the most economical, effective and safe manner possible. The need for the application of this technology is driven by the above requirements.

Telecontrol & Telecommunications - Economic Justification Procedure

The following considerations are used to evaluate the economic justification for procurement and replacement of telecontrol and telecommunication facilities and services on the Nova Scotia Power Inc. system.

Procurement of Facilities and Services
The procurement of telecontrol/telecommunication facilities and services shall be made according to the following process:

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- Examination of basic needs and alternatives (e.g. why is this required, why now, what other options are available, what are the consequences of doing nothing?).

- Examination of suitable technologies to provide an appropriate solution(s).

- Evaluation of alternative means of acquiring the above technologies including: design and build NS Power owned facilities and provide services using NS Power staff; rent or lease facilities and provide services using NS Power staff; rent or lease facilities and contract to others for services; and variants of the above as appropriate.

  Each alternative will be subject to full life cycle economic analysis which will include: capital costs, lease/rental costs, NS Power operating costs, contract costs and taxation.

- The alternatives will be ranked using the most appropriate measure (e.g. Net Present Value (NPV)), and the best alternative will be chosen (i.e. highest NPV or lowest Net Present Cost, etc.).

- Replacement of Facilities and Services.

- Capability to meet industry norms for performance, such that NS Power's ability to provide its customers with the required levels of service are not compromised.

- Obsolescence and/or lack of support from facility, spare parts and service suppliers, such that NS Power incurs unacceptable risk of financial loss and/or liability.

- Ability to provide the lowest overall operating costs to NS Power.

- Required to ensure compliance with NPCC and, or NERC Reliability Standards.

17.14 Information Technology Application and Hardware System

Information Technology (IT) is subject to rapid evolution, obsolescence, and evolving customer expectations. Accordingly, categories and justifications for IT capital investments vary, from mitigating risks associated with obsolescence to meeting customer needs and expectations. IT projects can be broadly justified under the following sub-criteria:

- Technical
- Economic
- Customer Experience

IT capital projects may be justified primarily under one of these sub-criteria or under a combination of them all. These categories and their justifications are expanded upon below.

Technical

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Technical projects are driven by criticality and condition based risk assessments of in-service assets. They are most frequently associated with mitigating risks associated with obsolescence, security, and system performance to meet requirements of the utility to serve customers. Technical projects are ranked according to the ranking matrix and methodology outlined in Section 6.2.

Economic

Economic projects are driven by opportunities to operate in a more cost effective manner. Economics may also be associated with Technical, and Customer Experience projects.

Customer Experience

Customer experience projects are driven by either stated or predicted needs of customers, and are reasonably expected to provide improvements to their experience and interactions with NS Power.

Information Application and Hardware Systems - Economic Justification Procedure:

The following procedures will be used to evaluate the purchase, replacement or upgrade of Information Application and Hardware Systems at NS Power:

- Any Information Application and Hardware System which fails or is predicted to fail NS Power's requirements for capacity, security or service levels will first be evaluated as to NS Power's current and future requirements.
- An economic evaluation will then be completed to determine the most cost effective alternative. Included in these alternatives will be the cost to:
    - Repair the Information Application and Hardware System to such a state as to meet NS Power's requirements.
    - Upgrade or modify other Information Application and Hardware Systems so as to eliminate NS Power's requirement for the plant in question.
    - Replace the Information Application and Hardware System as to maintain current business requirements.
- Any repairs, upgrades or modifications will be costed as per the manufacturer's and NS Power's specifications and standards. The costs for completing this work will include and compare NS Power's total cost of ownership (TCO) and/or manufacturer's costs. Included in these costs will be all capital, operating and maintenance labour, material, overheads, expenses, shipping and all other relevant costs or factors over the asset's expected useful

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life, which may affect these costs (i.e. availability of labour, material, revenue, etc.). Please refer to Section 6.7.5 for more information on TCO.

- New Information Application and Hardware System will be evaluated on a least cost basis considering the total cost of ownership (TCO) which satisfied NS Power's current and future requirements. Alternatives to purchasing new systems will include: modifications to existing systems, technological availability, capital, operating and maintenance costs such as labour, material, overheads, expenses, shipping and all other relevant costs or factors over the asset's expected useful life.

- The least cost technically acceptable option meeting all the requirements and constraints specified above shall be selected. The Total Cost of Ownership, as defined in Section 6.7.5, should be considered in the analysis.

17.15 Vehicles

Nova Scotia Power requires vehicles for the effective delivery of its services. There are two broad classifications used for vehicle identification; transportation and work vehicles.

Transportation vehicles are primarily used for transportation of personnel. Vans, cars, sport utility vehicles and trucks are considered transportation vehicles.

Work vehicles provide Nova Scotia Power personnel with the means to conduct their day-to-day work. Bucket aerial trucks, digger trucks, cranes, off road equipment, pole and wire trailers make up the majority of vehicles in this classification.

Vehicle Replacement Process

The first step in the review of any vehicle for potential replacement is that it meet the life cycle costing methodology initial screening criteria.

Vehicles proposed for replacement based on the screening criteria of vehicle age, kilometres and maintenance history are then subject to a mechanical inspection and analysis.

As part of this exercise, a Vehicle Standardization Committee made up of user group members establishes that the type of vehicle is still the most appropriate for the work use. As job functions change and new technologies evolve, a different vehicle may be specified.

Vehicle expenditures and decisions on vehicle maintenance and replacement are the responsibility of Fleet Services.

The Fleet Services group provides predictive maintenance information on each class of vehicle, along with individual vehicle records. This group also provides technical support and guidance for the selection of the appropriate vehicle for each class. The premise of vehicle replacement is

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to achieve the most economical decision based on life cycle costing, which includes predictive maintenance, age and kilometres.

NS Power follows the life cycle costing methodology to establish units that are a potential for replacement. Vehicle replacements are ranked and scheduled based on the overall benefits to all operating units.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
Detailed Document

Appendix A: Capital Projects within the NS Power Routine Program

Generation Routines

Generation Equipment Replacements

Each generating unit forecasts projects relating to capital replacements for repair and/or refurbishment of equipment that are not large enough in scope and magnitude to be justified as individual capital projects. The value of the equipment replacement routines will vary from year to year.

Upon identification of failure or deterioration in performance, a like for like replacement is completed immediately in the case of failure or at the next scheduled maintenance outage for the affected unit.

Generation Other Hydro

This routine provides for the costs associated with managing/reducing the risk of environmental events and security requirements for the hydro facilities. It also includes the acquisition of new land properties for business support activities and/or retiring land properties that are no longer business viable or required.

Annual condition-based analysis will dictate the scope of work required for each hydro facility.

Generation Other Thermal

This routine provides for the costs associated with efficiency-driven projects. These projects must directly impact and improve the Unit heat rate.

Transmission Routines

Transmission Substation Replacements, Additions, Modifications

This routine provides for the replacement of deteriorated or failed circuit breakers, bushings, instrument transformers, arrestors, batteries, chargers, switches, etc; modification or upgrade of existing equipment to prevent damage, extend serviceable life or reduce customer outages; replace primary equipment spares; and the retirement of failed or deteriorated transmission substation plant.

The replacement of deteriorated or failed equipment is immediate. Modifications are initiated as a result of identified system problems following a review of options. These are minor in nature. The least cost option meeting the requirements and constraints specified shall be selected.

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Primary Equipment Spares

This routine provides for the costs associated with ensuring an adequate level of spare substation equipment is maintained for high voltage system components.

Protection Modification & Replacement

This routine provides for transmission substation protective relays, under frequency load shedding, automatic line reclosing, metering, fault and sequence of event recorders along with spare relays and components that fail or are damaged during the year. It also covers minor modifications to inadequate protection and control logic schemes.

Minor modifications result from a change in system protection design criteria and can be traced back to the inadequacy from standard. This work is carried out in a planned manner with other work being carried out in the substation.

Damaged and failed equipment are replaced as soon as possible to maintain the operation of the substation.

Transmission Line Replacements, Additions, Modifications

This routine provides for the reactive and planned replacement of transmission line components.

Poles, structures and insulators which have been damaged or broken are replaced to maintain the transmission lines. Visual inspection or accident reports are used to identify the required replacement.

To maintain the service level, such failures are replaced immediately. The transmission line inspection program prioritizes circuits for component replacements on an annual basis.

Distribution Routines

Meters

This routine provides for the costs of purchasing and installing all classes of meters for customers.

Please refer to Capital Expenditure Justification Criteria: Metering Equipment for the justification criteria relating to metering.

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Nova Scotia Power Inc. Capital Planning & Capital Expenditure Justification Criteria
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Distribution Upgrades and Replacement

This routine covers the costs associated with reactive distribution plant replacement, planned distribution plant replacement, upgrades to the distribution system to achieve system performance improvements, the replacement of distribution assets as a result of damage caused by storms, and the replacement or addition of distribution assets that are required to accommodate government regulations.

Reactive distribution plant replacement is a result of equipment failing due to age, deterioration or destruction by outside forces (vehicles, vandalism, etc.). Planned distribution plant replacement is undertaken as a result of inspection programs.

The routine is estimated based on a combination of units to be replaced at an average unit cost and project costs as a result of inspection programs.

New Customers

This routine covers the utility's cost of adding new customers to the electrical system. Capital contributions required in aid of construction are governed by the Regulations approved by the Nova Scotia Utility and Review Board.

This routine is submitted on a Province wide basis based on an estimated number of new customers and on average per customer cost.

The vast majority of new customer connections result in a request for service. This initial contact established the timing, cost and complexity of the addition. Primary customers served at higher voltages require NS Power discussions regarding transformation, location, timing and detailed plans including costs.

Joint Use

There are three components which provide the funding level of the Joint Use Routine. Local field district work, Provincial sale of distribution poles under the Joint Use agreement to Bell Aliant and all other Joint use work contribute to the annual budget.

During the preparation of NS Power's ACE Plan, Bell Aliant may not have not prepared their province wide priorities for work to be carried out. As a result, NS Power identifies the total value of work it is prepared to do and sub-divides this work into field district level upon priority setting. This exercise combined with NS Power priorities for Joint Use work provides the basis for the annual budget development.

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Right-of-Way Widening

This routine provides for costs associated with right-of-way widening for both the distribution and transmission systems. Provincial Right of Way Widening often requires acquiring additional easements and is equivalent to newly purchased land. NS Power proactively widens right-of-ways where it is deemed that vegetation issues could result in a degraded reliability performance on the power system.

General Plant Routines

Work Vehicles

This routine covers the replacement and any additions to the transportation vehicle fleet. The item is prepared Province wide and managed by the Fleet Services group.

Please refer to Capital Expenditure Justification Criteria: Vehicles for the justification criteria relating to vehicle purchases.

Tools and Test Equipment

This routine covers tools and test equipment for field and plant operations. Customer Service, Hydro and Thermal each submit a province wide budget for tools and equipment which meet materiality and criteria requirements.

Telecommunications

This routine covers replacements and modifications in six areas, when the equipment has failed or is unserviceable.

- Mobile Radio Network & Systems Routine

  This includes mobile radios, portable radios, or remote control units, repeaters, gap filler repeaters, or base stations, cards and components, antennas, waveguides and power supplies.

- Voice Network & Systems

  This includes PBX Cards, disk drives, power supplies, software & component upgrades, telephone sets, fax machines, and wiring due to office moves.

- Telecom Systems Broadband Network & Systems

  - Broadband Network and Systems: Includes multiplexor, radio, and related system cards, power supplies, antennas, waveguides, fibre optic splice components, patch panels, and connectors.

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- Cable System and Circuits: Includes NS Power metallic and fibre cables and related termination equipment, positron cable protection installations as jointly identified by NS Power & Bell, individual communication channels and related materials.

- Voice Networks and Systems: Includes system operations voice system (SOPS), SOPS telephone sets, telecom site phones and order wire.

- Network Management Systems: Includes network management servers and software, telecom alarm monitoring devices and site monitoring equipment.

- Telecommunications Spares

  Includes: Maintenance Spares for telecommunication equipment and facilities, broadband networks and systems, cable systems and circuits, voice networks and systems and network management systems.

- Telecommunications Sites

  Includes: Upgrades and improvements to NS Power radio sites and telecommunication sites (i.e. backup generators), HVAC replacements, fences, buildings, etc.

- SCADA/Telecontrol Network & Systems

  Includes: Teleprotection, telemetry, and SCADA system, cards, components and power supplies, etc. (includes Ragged Lake Facility)

Computing Asset Management

This routine provides for the acquisition of hardware and software products to maintain the cost effective, secure and efficient operation of NS Power's computer and network facilities. The computer and network facilities are used for the development and operation of the financial, customer, human resources and engineering information processing applications for NS Power.

This routine includes the purchase of hardware and software products required for the continuing operation of the file servers distributed across the province, the midframe and mainframe platforms located at the main computer facility at Ragged Lake, and the computer data network which links these.

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Property Improvements and Furniture

This routine provides for improvements to NS Power property. These improvements can include environmental compliance work, or infrastructure replacement such as door, window and roof replacement. The routine work is based on on-going review of the state of NS Power land and buildings as identified by field and facilities staff evaluation.

This Routine also provides for the replacement of office and warehouse furniture and equipment. Furniture and equipment purchased as part of a new facility are not included in this item.

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Appendix B: Capital Item Documentation Policy & Review Requirements

Objective

To specify the documentation required to provide reasonable assurance that capital expenditures at Nova Scotia Power Inc. are incurred for the maximum benefit of the customer while ensuring compliance with applicable laws, regulations, and internal policies and processes.

Purpose

Documentation is prepared and retained for every capital project for the following reasons:

- To provide assurance that the capital expenditure(s) were necessary, that alternatives (including the status quo) were evaluated, that cost data was analyzed, and that an economic analysis was performed (if applicable);
- To demonstrate compliance with applicable laws, code of conduct, regulations and internal policies and processes;
- To communicate employee responsibility and accountability for the planning, management and control of spending activities relating to capital;
- To provide a source of historical information which can be referenced for future budgeting and spending; and
- To facilitate the transfer of project responsibilities and to assist in training.

Scope

This policy applies to all capital spending including routine and non-routine spending.

Accountability

Each capital project owner (person responsible for the project) is accountable for maintaining the appropriate level of documentation to support capital decisions, including development, justification, cost analysis and spending.

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Analysis of Alternatives

All alternatives must be reviewed prior to initiating a capital project. Generally, alternatives are developed through self-generated ideas, discussions with suppliers and consultants, technical articles, general utility trends, or a combination of the above. Some of these alternatives may not be feasible for various reasons and, in the end, usually several alternatives are examined using the Economic Justification Criteria. However, proper documentation shall be provided outlining the reasons why certain alternatives were not considered feasible (see Exhibit 'A').

Review and Approval Process

There will be two levels of review:

Level 1 Review (*See Table 1*)

This review is performed by:

- Person(s) responsible for planning, budgeting, controlling and managing the project (person responsible for the project),
- Person(s) responsible, within the Division/Department, for initial approval of the project. Approval is subject to the item meeting the Capital Expenditure Justification Criteria in place at the time the project is approved.

Documentation Requirements:

Sufficient documentation will be maintained to support the financial and technical content of the item from the ACE Plan, including the project in rate base and continues until the project is complete and received final cost approval. All documentation which provides assurance that the capital program is executed for the maximum benefit of the customer, while ensuring compliance with applicable laws, regulations, and internal policies and processes, will be accessible by or directed to those person(s) who have the authority to act on it, including NS Power Management and Internal Audit, Revenue Canada, and the Nova Scotia Utility and Review Board (see Exhibit 'A' for guidance).

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Level 2 Review (*See Table 1*)

This review is performed by:

- Person(s) responsible for final corporate approval of the capital item and confirming that the item meets the technical and financial criteria contained in the Capital Expenditure Justification Criteria at the time the project is approved.

Documentation Requirements:

Sufficient documentation will be maintained to provide reasonable assurance that the item meets NS Power's financial and technical justification criteria as contained in the Capital Expenditure Justification Criteria Document. All documentation which provides reasonable assurance that the criteria have been met will be accessible by or directed to those person(s) who have the authority to act on it, including NS Power Management and Internal Audit, Revenue Canada, and the Nova Scotia Utility and Review Board (see Exhibit 'A' for guidance).

Table 1

Process	Level of Review
ACE Plan Initiation & Approval	Level 1 & 2
Capital Spending Approval (Activation)	Level 1 & 2
Capital Monitoring (Cost Control)	Level 1
Capital Forecasting	Level 1
Capital Item Authority to Overspend (ATO)	Level 1 & 2
Rate Base Inclusion	Level 1 & 2
Final Costing	Level 1 & 2

File Content Guidelines

Exhibit 'A' provides a guideline for the documentation to be maintained in the capital file(s).

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Records Retention Period

All capital files should be maintained for a minimum of six years from the in-service date of the asset to meet the Taxation Authorities requirements. Prior to six years a letter of permission must be obtained from the Taxation Authorities before the capital file(s) is (are) destroyed. The Corporate Tax Services Department and the Secretary and General Counsel Division should be contacted for assistance if required. Retention beyond the minimal requirement of six years should be based on other requirements. For example, due to the long term nature of capital expenditures, certain support documentation contained in the capital file(s) may provide a source of information for future capital expenditures or may be required to support several expenditures over a specified planning period. In addition, certain legal, safety or environmental issues associated with particular capital projects may warrant a longer retention period than six years. In these and other instances, the retention period will be based on the particular situation.

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Exhibit A

Note: The descriptions provided are intended to be used as guidelines. The actual file contents will vary depending on the capital item.

Description	Contents	Level	
		1	2
A) Authorization Details	Authorization - Divisional approval If >$1M or U&U: Executive committee approval UARB approval - Corporate approval (approval detail can be found on Capital Item Detail Report)		x
B) Analysis of Alternatives	Includes : - Description of the possible alternatives associated with the capital project - Reasons why certain alternatives required no further analysis - Reasons for choosing the accepted alternative	x	
C) Capital Item Detail Information	Includes: Annual spending requirements - ACE Plan - Approved spending - Additional spending - Forecast - Final cost	x	x
	Online recommendations/approvals - Item recommendation - Item approval - Item activation		
	Description - Scope - Project components/costs		

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Description	Contents	Level	
		1	2
	Account listing - Account numbers - Responsibility codes - Amounts		

	Justification
	- Criteria & sub-criteria
	- Document(s) name & location
	- Person responsible
	- Memo
	  - Why do the project?
	  - Why now?
	  - Why this way?
	- References - legislation, regulations		

	Reason for over or under expenditure, final costing - Description		
D) Economic Analysis	Analysis output including: - Supporting documentation for revenue, capital & operating costs - All calculations & major assumptions - Recommendation - Qualitative factors - All other relevant support documentation	x	x
E) Correspondence	- UARB - Other	x	x

F) Technical & Financial Criteria (*See Capital Expenditure Justification Criteria*)	Working papers supporting
	- Derivatives & calculations
	- Explanation of changes in scope or amount
	- Source of costs
	  - Historical, standard
	  - Manufacturer quotes
		x	

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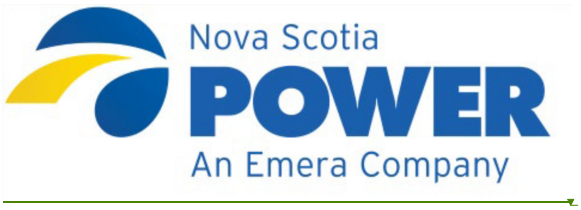
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Description	Contents	Level 1	Level 2
	Budget estimates	x	
	Other relevant information - (*content will vary*) Examples include: - Regulations, acts, codes - Permits, licences, guidelines, agreements - Engineering studies & assessments - Pole test results - Planning reports - Outage reports - Retreatment data - Insulating oil, insulations, circuit interrupter, electrical protection, battery tests - Annual inspection reports, stave sampling, performance reports - Production models - Joint use information	x	
G) Cost Control, Final Costing	Cost monitoring, forecasting & final costing - Reports (eg. work scheduling) - Supporting worksheets and analysis	x	
	Retirement Information	x	
	Tenders and bid evaluations	x	
	Financial reports, including - Power Plant Information- General ledger - Purchasing & Accounts Payable - Labour Distribution - Documentation to support assumptions, decisions, or other factors which change the expected cost and/or scope of the project.	x	

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Appendix C: System Design Criteria



NS Power
System Design Criteria

Report number NSPI-TPR-003-6

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REVISION RECORD

Date	Version Number	Approver , Date Signature		Comments
1995/01/12	0			Initial document
2010/10/07	1	T. Leopold	7-Oct-10	Updated to align with changes to System Design Criteria and better align with NERC/NPCC standards
2013/05/10	2	P. Zinck	10-May-13	Revised fault clearing time requirements for Primary and Secondary Transmission, contingency loading for Remote Transmission, and system transformer loading.
2016/03/24	3	D. Stanford	24-Mar-16	Updated to include Looping Policy
2016/07/21	4	D. Stanford	21-Jul-16	Updated to correct version of Looping Policy
2022/11/15	5	C. Milligan	29-Aug-23	Updated definition of Primary, Secondary, and Electrically Remote transmission systems.
2024/02/20	6	C. Milligan	10-Apr-24	Updated to include Transient Voltage Criteria per NERC TPL-001

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PURPOSE

The purpose of this document is to state the Nova Scotia Power Inc. (NS Power) planning and development criteria to be applied to new additions to NS Power transmission system planned or constructed after the effective date of this document. NS Power's transmission system is divided into four classifications, each of which is governed by different design criteria. Where and when applicable, NS Power criteria will be superseded by the Northeast Power Coordinating Council (NPCC) criteria.

The NS Power classifications are as follows:

1. Primary Transmission
2. Secondary Transmission
3. Electrically Remote Transmission
4. Transformation

The NS Power System Design Criteria combine protection performance specifications with system dynamics and steady state performance requirements. When system expansions are undertaken, facilities are to be constructed such that the criteria are met. The specified speed of protection systems must be achieved unless faster speeds are specified, or slower speeds are accepted based on system studies. System studies to determine adequacy and investment requirements must be conducted using the actual characteristics (setting and operating time) of existing protection systems.

DEFINITIONS

1. **Normal system conditions** are defined to include all of the following:
   a. Expected load conditions.
   b. All transmission facilities in service (no line or transformer maintenance).
   c. Economically scheduled and dispatched generation allowing for planned generator maintenance outages (non-firm generation is not included as economically dispatched generation). Economic dispatch may be influenced by environmental or regulatory restrictions.
   d. Stable steady-state operation of the Interconnected Transmission System.
   e. All system voltages within 95% to 105% of nominal, unless otherwise noted.
   f. All system elements operating within their continuous thermal ratings, unless otherwise noted.
2. A **system element** is defined to be any one generator, transmission line, transformer or bus section.

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3. **Breaker back-up** is defined to be protection against a local breaker's failure (mechanical or electrical) to trip when initiated by an associated protection operation. The term "**Breaker failure protection**" is used interchangeably in this document.
4. **Single contingency** is defined as loss of one **system element** with or without a fault.

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1. PRIMARY TRANSMISSION SYSTEM

Primary Transmission is defined as 230kV and above and any other NPCC Bulk Power System transmission.

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The protection system must be designed with redundancy to cater to any single element failure, in keeping with good utility practice and conform to industry standards.

Unless otherwise specified, and determined appropriate by transient stability studies, the following fault clearing times will be applied to the Primary Transmission system. Any deviations from these criteria must be submitted to the system planning group for approval.

a. For a three phase or phase to ground fault on the local bus or on any element directly connected to the local bus such that it is within the instantaneous protection zone for that element (e.g. 21Z1, 87, 50) the fault contribution clearing time will be 4 cycles.
b. Where breaker failure protection is required to trip local breakers to isolate the fault described in item (a), the fault clearing time will be 12 cycles.
c. Where breaker failure protection is required to trip remote breakers to isolate the fault described in item (a), the fault contribution clearing time will be 14 cycles.
d. For a three phase or phase to ground fault on any element directly connected to the local bus such that it is outside the instantaneous protection zone for that element (e.g. 21Z2, 51) the fault contribution clearing time will be 6 cycles.
e. Where breaker failure protection is required to trip local breakers to isolate the fault described in item (d), the fault contribution clearing time will be 14 cycles.
f. Where breaker failure protection is required to trip remote breakers to isolate the fault described in item (d), the fault contribution clearing time will be 16 cycles.

Breaker failure protection will be applied to all Primary Transmission.

The design criteria are:

1. From **normal system conditions**, the Interconnected Transmission System dynamic response shall be stable and positively-damped following a permanent three-phase fault on any one system element cleared in prime time. No cascade tripping shall occur.
2. From **normal system conditions**, the Interconnected Transmission System dynamic response shall be stable and positively-damped following a permanent line-to-ground fault on any one system element cleared in prime time. No cascade tripping shall occur.
3. From **normal system conditions**, the Interconnected Transmission System dynamic response shall be stable and positively-damped following a permanent line-to ground fault on any one system element cleared in breaker back-up time.

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No cascade tripping beyond elements cleared by the operative back-up protection shall occur.

4. From **normal system conditions**, following loss of any one system element with or without fault, all system elements shall be within 110% of their thermally limited ratings under the condition that the System Operator can take action within a 10 minute period to reduce load on the element.
5. From **normal system conditions**, for the loss of any one system element with or without fault, steady-state post-contingency Interconnected Transmission System bus voltages shall be not less than 90% or greater than 110% of nominal following correction by automatic tap-changers. In addition, no bus shall experience a voltage change from pre-fault to post-fault condition greater than 10% before movement of tap-changers.
6. As far as possible, provision should be made to ensure that no fault is left permanently on the system.
7. From **normal system conditions**, following a fault, the minimum post-fault positive sequence voltage sag shall remain greater than 70% of nominal voltage, and shall not remain below 80% of nominal voltage for greater than 250ms during the 10s period following a fault.

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2. SECONDARY TRANSMISSION SYSTEM

This category includes all other transmission facilities which are not included in the Primary Transmission nor the Electrically Remote Transmission categories.

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The protection system must be designed with sufficient redundancy to cater to any single element failure, in keeping with good utility practice and conform to industry standards. The following fault clearing times will be applied to the Secondary Transmission system. Any deviations from these criteria must be submitted to the system planning group for approval.

a. For a three phase or phase to ground fault on the local bus or on any element directly connected to the local bus such that it is within the instantaneous protection zone for that element (e.g. 21Z1, 87, 50) the fault contribution clearing time will be 6 cycles.

b. Where breaker failure protection is required to trip local breakers to isolate the fault described in item a), the fault contribution clearing time will be 14 cycles.

c. Where breaker failure protection is required to trip remote breakers to isolate the fault described in item a), the fault clearing time will be 16 cycles.

d. For a three phase or phase to ground fault on any element directly connected to the local bus such that it is outside the instantaneous protection zone for that element (e.g. 21Z2, 51) the fault contribution clearing time will be 8 cycles.

e. Where breaker failure protection is required to trip local breakers to isolate the fault described in item d), the fault contribution clearing time will be 16 cycles.

f. Where breaker failure protection is required to trip remote breakers to isolate the fault described in item d), the fault contribution clearing time will be 18 cycles.

Breaker failure protection will be applied to Secondary Transmission if system studies determine the requirement.

The design criteria are:

1. From **normal system conditions**, the Interconnected Transmission System dynamic response shall be stable and positively-damped following a permanent three-phase fault on any one **system element** cleared in prime time. No cascade tripping shall occur.

2. From **normal system conditions**, the Interconnected Transmission System dynamic response shall be stable and positively-damped following a permanent

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line-to-ground fault on any one **system element** cleared in prime time. No cascade tripping shall occur.

3. From **normal system conditions**, the Interconnected Transmission System dynamic response shall be stable and positively-damped following a permanent line-to ground fault on any one **system element** cleared in **breaker back-up** time. No cascade tripping beyond elements cleared by the operative back-up protection shall occur.

4. From **normal system conditions**, following loss of any one system element with or without fault, all system elements shall be within 110% of their thermally limited ratings in steady state, under the condition that the System Operator can take action within a 10 minute period to reduce load on the element.

5. From **normal system conditions**, for the loss of any one system element with or without fault, steady-state post-contingency Interconnected Transmission System bus voltages shall be not less than 90% or greater than 110% of nominal following correction by automatic tap-changers. In addition, no bus shall experience a voltage change from pre-fault to post-fault condition greater than 10% before movement of tap-changers.

6. As far as possible, provision should be made to ensure that no fault is left permanently on the system.

7. From **normal system conditions**, following a fault, the minimum post-fault positive sequence voltage sag shall remain greater than 70% of nominal voltage, and shall not remain below 80% of nominal voltage for greater than 250ms during the 10s period following a fault.

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3. ELECTRICALLY REMOTE TRANSMISSION SYSTEM

This category is defined by the buses at which the maximum fault levels do not exceed 1,000 MVA three-phase.

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1. The Interconnected Transmission System dynamic response shall be stable and positively-damped following a fault on any one **system element.**

2. From normal system conditions, following a **single contingency**, all system elements shall be within 110% of their thermally limited ratings under the condition that the System Operator can take action within a 10 minute period to reduce load on the element.

3. From **normal system conditions**, for any **single contingency**, steady-state post-contingency system bus voltages shall not be less than 90% and not be greater than 110% of nominal following correction by automatic tap-changers. In addition, no bus shall experience a voltage change from pre-fault to post-fault condition greater than 10% before movement of tap changers.

4. As far as possible, provision should be made to ensure that no fault is left permanently on the system.

5. **Breaker back-up** will be applied to Electrically Remote Transmission if system studies determine the requirement.

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4. TRANSFORMATION

Capacity for any individual transformation point shall, under **normal system conditions**, be sufficient to meet the daily load requirements after due consideration is given to the following:

a. Economic dispatch or outage of generation.

b. Loading of transformer(s) to their (or their associated equipment) thermally limited ratings.

Reinforcement is required in all cases when a single contingency results in either thermal damage to equipment in attempting to continue to supply the load, or inability to meet the daily load requirements in whole or in part after due consideration is given to the following:

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a. The capacity of the underlying interconnection(s) with another supply point(s) when applicable.

b. Out-of-merit running of generation when applicable.

c. Loading of remaining station(s) transformer(s) to their (or their associated equipment) thermally-limited ratings as per the Notes below. (This in conjunction with (a) and (b) above as applicable.)

d. Largest available **suitable** mobile transformer loaded to its nameplate rating. (This in conjunction with (a) and (b) above as applicable.)

Notes:

1. Reinforcement may be the economic choice even if (a), (b) and (c) or (d) result in satisfaction of the load supply criterion because estimated out-of-merit costs may significantly exceed the costs of capital advancement.

2. In accordance with methods accepted within North America, and particularly with reference to "C57.91-1995 IEEE Guide for Loading Mineral-Oil-Immersed Transformers", it is NS Power practice to permit the loading of transformers to exceed the nominal or nameplate value.

3. For distribution load serving transformers to exceed the nominal or nameplate value, where calculations are not specifically conducted, overload capability assumptions based on normal cyclic daily loading may be made, but shall not exceed 133% of the top nameplate rating. In any case the maximum overload capability is not to exceed the current NS Power SCADA Alarm limits. In special circumstances, such as **single contingency** situations where some means of reducing the overload exists, a thermal rating based on a loss of life of 2 1/2% may be applied to distribution load serving

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transformers, in accordance with the above and engineering judgment. The loss of life permitted is measured over the time required to reduce the loading on the transformers. This may be done by switching low voltage circuits or relieving load by use of a mobile transformer.

4. For system power transformers, where calculations are not specifically conducted:

   a. Under system normal, loading is limited to 100% of the 65°C manufacturer nameplate MVA for summer and 110% for winter;

   b. Under contingency, the 15 minute short time rating is limited to 110% of the 65°C manufacturer nameplate MVA for summer and 120% for winter, provided that the system operator has the means to reduce the overload to system normal rating within 15 minutes;

   c. Consideration should be given to the ratings of the auxiliary equipment such as CTs, PTs, bushings and tap changers.

5. When no means of reducing the overload exists, a 0% loss of life is used.

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ATTACHMENTS

A. NOVA SCOTIA POWER INC. RADIAL TRANSMISSION POLICY

A radial load is a load center, such as a substation, that provides power to a large population, connected to the power grid via a single transmission line. Loss of a radial transmission line results in loss of supply with no other way to connect the radial load to the grid. A single transmission line may have more than one radial load connected to it.

A lone substation, which is dedicated to a single customer, is not considered a radial load in this context. Any load, which is tapped from a transmission line connected between two supply points, is not considered a radial load since this load can be fed from either supply location.

Where a radial load exceeds 40 MW, a planning study will be undertaken. The planning study will examine options of reducing the size of the load by load transfer to other substations, by considering local generation in the vicinity, and by other practical load reduction methods.

The planning study will also examine options to improve the line performance such as: vegetation control, lightning mitigation, line upgrade, and other practical technological methods.

In the case of multiple radial loads, which are connected to one radial transmission line, the planning study will examine the option of installing remote switching at the upstream substations to provide fast restoration to the radial loads upstream from the faulted line section.

Implementation of the above "stepped" approach will be the first mitigation measure for any radial load above 40 MW. After implementation of these measures, should the radial load remain above 40 MW and should the existing transmission supply exhibit deterioration in reliability, then a second transmission line will be evaluated to provide loop feed to improve the reliability.

When radial load grows past 60 MW, a second transmission line will be evaluated regardless of performance.

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Mersey Hydro Update

1.0 INTRODUCTION

The Hydro Interval Plan (HIP) provides a high-level overview of NS Power's estimated annual capital expenditures that will be required for its hydro generation assets over the next 40 years. The HIP provided in the 2023 ACE Plan process showed the deferral of the Mersey Redevelopment project, with capital investment for the redevelopment estimated to begin in 2031. The HIP provided in the 2024 ACE Plan included updates to NS Power's estimated annual capital expenditures based on the same assumptions regarding deferral of the Mersey Redevelopment. In its 2024 ACE Plan Order, the Board provided the following direction:

> 7. The Board directs NS Power to once again provide a comprehensive update on the Mersey Hydro System Redevelopment Project in its 2025 ACE Plan.[1]

In the sections that follow, NS Power provides:

- Additional detail on the updated incremental sustaining investments that have been incorporated into the HIP following the deferral of CI 39472 HYD - Mersey Redevelopment Phase 1;

- An update on the ongoing work associated with the Mersey Redevelopment and the continued engagement with Acadia and Bear River Mi'kmaq communities, DFO, and the Nova Scotia Government;

- A revised excerpt from the current HIP which includes the current planned sustaining investment in the Mersey Hydro System (MHS), as well as the current forecast for the Mersey Redevelopment and provides an analysis of the Net Present Value (NPV) of each.

[1] M11458, NS Power 2024 Annual Capital Expenditure (ACE) Plan, NSUARB Order, August 13, 2024.

2.0 SUSTAINING INVESTMENT

In order to facilitate the safe deferral of the Mersey Redevelopment, NS Power identified incremental, smaller scale sustaining investments which were initially incorporated into the Hydro Interval Plan (HIP) in 2023, and updated in 2024.

The most recent HIP update was provided as Attachment 1 to NS Power's response to 2024 ACE Plan NSUARB IR-32. The additional sustaining investments were also included in the table provided as Attachment 2 to NS Power's response to 2024 ACE Plan NSUARB IR-32 which outlined work planned for hydro assets in 2024 and beyond.

The HIP is continuously updated based on information available at the time and as a result, sustaining costs for the full 40-year timeframe will vary from year to year.

Further updates and prioritization of the sustaining capital plan for the MHS have occurred in preparation for the 2025 ACE Plan and have been incorporated into the HIP. Please refer to Attachment 1 for the MHS related investments currently included in the HIP for the years 2025-2064. The current HIP includes sustaining investment in the years 2025-2030 of $45.5M, as shown in Attachment 1. This is consistent with the estimated $46.6M for the same time period, included in NS Power's prior year Mersey Hydro Update submission.

The MHS water retaining structures and powerhouses require capital investment to replace existing structures. At present, the optimal path to maintaining long-term operation of the MHS is through a series of redevelopment projects, which would allow the existing structures to be decommissioned and replaced with new, modern water retaining structures and powerhouses, currently expected to take place over a period of 20-30 years from the start of construction. Approaching the redevelopment in this way allows for continued generation through the construction period. As stated above, NS Power has increased the incremental sustaining investment in the MHS to allow for continual safe and reliable operation of the system, until redevelopment of the major civil structure assets (e.g., dams, spillways, powerhouses) begins in the early 2030s.

In the sustaining capital plan for the MHS, NS Power has prioritized investment in the assets to allow for safe and reliable water management on the MHS. The sustaining investment plan includes mechanical and electrical overhauls of the generating units and the supporting crane equipment to facilitate the overhauls, replacement and/or refurbishment of critical water control devices (e.g., log hoists, sluice gates), minor civil structural restoration to powerhouse, dam and spillway structures, and other minor investments to balance of plant equipment to improve the overall operation and safety of the MHS. More specifically, the investment plan includes sustaining investment in:

- Generating Units: Continued sustaining investment in the generating units will support continued safe and reliable operation of the MHS while also continuing to provide renewable energy towards NS Power's overall plan to achieve 80 percent Renewable Energy Standards (RES) by 2030. The active management of water through the spillway structures (i.e., gates, log bays) is required at all times to manage the water flow because inflow of water from rain events can exceed the capacity of the generating units. Reliable operation of the units also reduces the need to manipulate the log hoists and gate structures to properly manage water flow and levels for safety and environmental purposes, as, unlike the generating units, they cannot be operated remotely and require manual intervention at site to operate. In 2024, NS Power completed a unit overhaul on Unit 11 at the Cowie Falls Powerhouse and replacement of the penstock filler gates (CIs C0053655 HYD COW11 Overhaul, C0053657 HYD COW Filler Gate Replacements, and C0053656 HYD COW11 Generator Refurbishment).

- Fish Passage: As additional requirements and conditions are set out by Fisheries and Oceans Canada (DFO) with respect to continued compliance with the modern *Federal Fisheries Act*, additional sustaining investment in fish passage on the MHS is expected to be required. This is expected to include refurbishment of the three existing fish ladders on the MHS.

- Remote Monitoring/Instrumentation: Investment in remote monitoring and instrumentation for civil and mechanical assets will further support the safe and reliable operation of the system by enhancing the resilience and quality of reservoir level data. This is expected to include reviews and updates for concrete condition monitoring, and updates to piezometers along the dams.

- Spillways and sluice gates: In order to ensure they maintain their capacity to transport water during a major precipitation event, the spillways and sluice gates along the river require sustaining investment. In 2024, NS Power completed the replacement of stop log hoists at the Cowie Falls and Lower Great Brook powerhouses (CIs C0049032 HYD COW Hoist Replacement and C0049013 HYD LGB Hoist Replacement).

- Electrical Assets: Sustaining investment for electrical assets such as breakers and other switchgear equipment is required to address personnel safety risks associated with arc flash hazards. In 2024, this included the replacement of the switchgear at Lower Great Brook (CI C0036368 HYD LGB Switchgear Replacement).

The Mersey Redevelopment is a collection of large-scale, complex, hydroelectric projects. Given the complex nature of the projects and the multitude of factors which must be considered for projects of this scope and size, NS Power must complete additional preliminary engineering work, Mi'kmaq and stakeholder engagement and environmental studies to confirm the full scope of work and ensure that the path forward remains the best value for customers prior to submission to the NSUARB for approval. The sustaining capital investment plan which will support the MHS in the interim will allow for the continued, safe operation of the MHS while the additional preliminary engineering work and stakeholder engagement are carried out.

3.0 ONGOING PROJECT DEVELOPMENT AND MI'KMAQ AND STAKEHOLDER ENGAGEMENT

NS Power continues to work through the environmental permitting process for the Mersey Redevelopment. There are many archaeological and environmental considerations associated with the MHS, and NS Power continues to have meaningful conversations with the Mi'kmaw communities of Acadia and Bear River, as well as DFO and the Nova Scotia Government including Nova Scotia Departments of Environment (NSECC), Natural Resources and Renewables (NSDNRR) and Communities Culture Tourism and Heritage (CCTH). NS Power's goal is to achieve a common understanding and agreement on approach with respect to expectations for archaeology and environment as it relates to the project prior to moving forward and submitting an application for approval.

NS Power's recent experience indicates that additional requirements and conditions are being set out by DFO with respect to continued compliance with the modernized *Fisheries Act* (2019) which may result in material project impacts. In order to move forward with the Mersey Redevelopment, NS Power must have a clear understanding of the conditions associated with continued compliance with the *Fisheries Act* and requirements for permit approval. In particular, NS Power is continuing conversations with DFO in order to understand requirements associated with fish passage that have not been in place previously, as recent hydro projects have seen a trend in increased requirements associated with fish passage and subsequent impacts to project timing, cost and scope. Most recently, NS Power has increased regular engagement with DFO to improve information sharing and feedback on upcoming projects and DFO priorities. In addition, NS Power is continuing to build on lessons learned from other projects, including those on the Mersey Hydro System, that require engagement with DFO, Mi'kmaw communities and other stakeholders.

As feedback received from these conversations and engagements is integrated into the overall strategy for the watershed, NS Power is improving its understanding of the broader impacts on the long-term planning, development, and execution of the overall Mersey redevelopment efforts. NS Power will continue to engage with government, the Mi'kmaq, and external stakeholders as these items are further defined and will provide preliminary project planning details to the Mi'kmaq

communities and DFO prior to submitting capital items associated with the Mersey Redevelopment to the NSUARB.

Recent hydro projects also indicate that environmental and archaeological costs and scope requirements typically impact project alternatives in a similar way, i.e., if archaeological or environmental costs or scope increase for a redevelopment alternative, they will also increase with a decommissioning or naturalization alternative. However, as with all capital projects, NS Power will continue to evaluate and assess project alternatives based on the most current available information to ensure that the selected project alternative remains the lowest cost option for customers.

The deferral of the Mersey Redevelopment is consistent with NS Power's asset management methodologies. Where possible, deferring projects where safety and economic risks associated with the project can be managed is in the best interest of customers. This approach also ensures the Company can complete the required engagement with Rights holders and external stakeholders, as well as continue discussions with DFO on the priority investments in fish passage to be in a position to submit a complete application to the NSUARB for approval.

4.0 CURRENT FORECAST

The HIP is directional, and does not provide specific project scopes or costs. Similar to the Integrated Resource Plan (IRP) (a 25-year strategic plan that considers supply side and demand side utility options to serve customers under a range of potential futures), the HIP does not, and cannot, evaluate specific capital projects, or alternatives to specific projects. Input assumptions for the HIP or IRP are not developed at the detailed level that they are for capital project justification; rather they are directional and provide ranges of costs, generally low, medium and high, to capture uncertainties. Neither tool is a replacement for an application to the NSUARB for approval of specific NS Power initiatives, but both are valuable planning documents which evaluate what work is required in order to meet future electricity requirements reliably and cost effectively and in compliance with current and emerging operational and environmental constraints.

The HIP incorporates the best information available at the time of planning, as well as predictions about potential decisions that are subject to change as constraints and priorities evolve. As such, both the sustaining investment and forecast for the Mersey Redevelopment included in the HIP will change as additional information is obtained. In particular, the forecast cost and scope requirements associated with archaeology and environment will be refined as engagement and discussion continues and the associated impacts can be incorporated into long-term project planning. However, in order to confirm that investments in various hydro systems continue to be the lowest cost option for customers, the NPV figures included in the annual HIP updates provide a tool for analyzing the economics of various options.

During the 2023 ACE Plan process, NS Power agreed that it is also fair to expect the total estimated cost for the Mersey Redevelopment to increase as a result of the deferral and the related impact of inflation and construction cost increases and noted that the estimated cost will be updated in future HIPs.[2] The forecast capital investment for Mersey Redevelopment included in the previous year Mersey Hydro Update was approximately $1.20 billion. The most current forecast, included in Attachment 1, remains consistent, at approximately $1.20 billion, with NPV of $561.8 million.

[2] M11017, NS Power 2023 ACE Plan, Board Decision, September 12, 2023, page 41-42, paragraph 109.

The total capital required for sustaining investment (2025-2064) increased from $118.6 million in the previous year Mersey Hydro Update to $160.7 million, included in Attachment 1. The increase in total investment is attributed to bridge refurbishment work at Big Falls, Lower Great Brook, and Lower Lake Falls, additional powerhouse structure investment, a fish ladder at Upper Lake Falls, and fishway modifications expected at Lower Great Brook, Deep Brook, and Cowie Falls. The NPV for sustaining investment has slightly decreased from $69.7 million in the previous year Mersey Hydro Update submission to the current forecast of $68.1 million. NS Power continues revise the profile of the investment in accordance with its asset management principles to ensure projects are scheduled at appropriate interval, which has resulted in a consistent NPV of the sustaining investments.

5.0 CONCLUSION

NS Power has increased the incremental sustaining investment in the MHS to allow for continual safe and reliable operation of the system, until redevelopment of the major civil structure assets begins with the first phase of the Mersey Redevelopment in the early 2030s. Deferral of redevelopment allows NS Power to complete additional preliminary engineering work, Mi'kmaq and stakeholder engagement and environmental studies to confirm the full scope of work and ensure it remains in the best interest of customers. Approaching redevelopment in a staged way allows for continued generation and minimization of environmental impact through, the construction period. The optimal path to maintaining long-term operation of the MHS is through the Mersey Redevelopment initiative, which will allow the existing structures to be decommissioned and replaced with new, modern water retaining structures and powerhouses.

The incremental investment required to support the deferral has been carefully planned in order to ensure the continued safe operation of the MHS and compliance with operating requirements. The investments include mechanical and electrical overhauls of the generating units and the supporting crane equipment to facilitate the overhauls, replacement and/or refurbishment of critical water control devices (e.g., log hoists, sluice gates), minor civil structural restoration to powerhouse, dam and spillway structures, and other minor investments to balance of plant equipment. These investments are revisited and re-evaluated as more information is obtained, and the HIP is continuously updated as forecasts are revised as result.

NS Power reiterates that it is committed to ensuring stakeholders, Mi'kmaw communities, and the Board are actively engaged prior to the submission of relevant Mersey redevelopment projects. The Company has not to date, nor will it in the future, take any steps with respect to the Mersey Redevelopment on "short notice", and NS Power has been, and continues to be, deliberate in its attempts to find the best approach for customers and stakeholders, which includes continued engagement with Mi'kmaw partners, Fisheries and Oceans Canada (DFO), and third-party dam safety consultants.

The HIP is filed annually with the NSUARB as part of the ACE Plan process and includes an NPV analysis for both sustaining and redevelopment investments in the MHS. The inputs to the HIP are continuously reviewed and updated as additional information is obtained and are shared with the NSUARB and Intervenors annually through the ACE Plan process. NS Power will continue to evaluate and optimize the long-term plan for the MHS to the benefit of customers and will submit CI 39472 HYD - Mersey Redevelopment Phase 1 once the Company is in a position to provide a complete application to the NSUARB.

NON-CONFIDENTIAL

2024 Q4 WACC Rate	5.81%

System	TOTAL or NPV	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Mersey											
Redevelopment											
Total Capital Investment	**$ 1,204,220,000**	$ 40,000		$ 40,000		$ 40,000		$ 11,500,000	$ 36,730,000	$ 65,770,000	$ 56,990,000
NPV	**$ 561,754,309**										
Mersey											
Sustaining											
Total Capital Investment	**$ 160,690,080**	$ 4,922,601	$ 12,001,416	$ 10,518,346	$ 4,750,000	$ 2,750,000	$ 10,599,176	$ 3,603,720	$ 4,594,743	$ 5,155,301	$ 4,541,352
NPV	**$ 68,052,503**										

NON-CONFIDENTIAL

2024 Q4 WACC Rate	5.81%

System	TOTAL or NPV	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Mersey											
Redevelopment											
Total Capital Investment	**$ 1,204,220,000**	$ 41,060,000	$ 63,710,000	$ 72,490,000	$ 64,330,000	$ 73,830,000	$ 68,710,000	$ 51,010,000	$ 54,960,000	$ 75,520,000	$ 68,890,000
NPV	**$ 561,754,309**										
Mersey											
Sustaining											
Total Capital Investment	**$ 160,690,080**	$ 1,950,391	$ 994,699	$ 887,769	$ 905,525	$ 923,635	$ 1,345,868	$ 960,950	$ 2,100,362	$ 1,142,597	$ 2,476,579
NPV	**$ 68,052,503**										

NON-CONFIDENTIAL

2024 Q4 WACC Rate	5.81%

System	TOTAL or NPV	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
Mersey											
Redevelopment											
Total Capital Investment	**$ 1,204,220,000**	$ 54,960,000	$ 75,520,000	$ 68,890,000	$ 54,960,000	$ 75,520,000	$ 58,630,000	$ 10,120,000			
NPV	**$ 561,754,309**										
Mersey											
Sustaining											
Total Capital Investment	**$ 160,690,080**	$ 891,568	$ 1,818,800	$ 1,082,186	$ 1,103,829	$ 3,377,718	$ 2,624,970	$ 4,518,229	$ 5,632,725	$ 5,571,277	$ 6,117,785
NPV	**$ 68,052,503**										

NON-CONFIDENTIAL

2024 Q4 WACC Rate	5.81%

System	TOTAL or NPV	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064
Mersey											
Redevelopment											
Total Capital Investment	**$ 1,204,220,000**										
NPV	**$ 561,754,309**										
Mersey											
Sustaining											
Total Capital Investment	**$ 160,690,080**	$ 1,086,817	$ 5,173,249	$ 3,957,535	$ 1,730,008	$ 7,842,704	$ 1,199,934	$ 7,547,583	$ 9,987,288	$ 1,910,069	$ 10,390,775
NPV	**$ 68,052,503**										

2025 ACE Plan
Appendix H

The Path to 2030 - 2024 Update

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1.0 EXECUTIVE SUMMARY

The Nova Scotia Utility and Review Board (NSUARB, Board) provided the following direction to Nova Scotia Power Incorporated (NS Power, Company) in its 2023 Annual Capital Expenditure (ACE) Plan Order (M11017) of September 12, 2023: "File a detailed and specific plan outlining how the Company will achieve the 2030 obligations, what specific steps are required to meet these obligations, how the proposed steps will accomplish that goal, and when these steps will be taken." NS Power provided *The Path to 2030* report to the NSUARB on December 22, 2023. By letter on January 2, 2024, the Board entered *The Path of 2030* as an exhibit in the 2024 ACE Plan proceeding, and included it on the NSUARB's 2024 ACE Plan final issues list. In the NSUARB's Decision regarding the 2024 ACE Plan, it provided further direction regarding *The Path to 2030* reporting, as follows: "The Board directs that NS Power file an update on The Path to 2030 in the ACE Plan on an annual basis until 2030." This year's *The Path to 2030* report is submitted to the NSUARB with the 2025 ACE Plan in compliance with the Board's directive.

The Government of Nova Scotia's 2030 Clean Power Plan, released in October 2023, provides a comprehensive path forward for the province, and in particular NS Power, in meeting its 2030 Decarbonization Goals of achieving 80 percent electricity sales from renewable resources and the phase-out of coal generation by 2030. The 2030 Clean Power Plan aligns with NS Power's Evergreen IRP Action Plan & Roadmap Update (M11307) completed in partnership with stakeholders in 2023. The high degree of alignment between the 2030 Clean Power Plan and the updated IRP Action Plan and Roadmap is positive, indicating there is clarity on the actions required to achieve the goals. Collectively, the 2030 Clean Power Plan and NS Power's IRP Action Plan and Roadmap outline various investments and actions required in meeting the 2030 Decarbonization Goals.

In 2024, following recommendations by the Clean Electricity Solutions Task Force, the Provincial government announced a plan to create a new Independent Electricity System Operator in Nova Scotia (NSIESO) and a stand-alone energy regulator, called the Nova Scotia Energy Board. The

creation of these two new entities changes the electricity planning landscape in Nova Scotia including several changes to the Project Accountability Matrix.

- As described in **Section 4.0** and **Section 5.2.1**, any future Battery Storage projects will be scoped and procured by the NSIESO.

- As described in **Section 4.0** and **Section 5.4.1**, all Fast-Acting Generation projects will be procured by the NSIESO, including responsibility for the first 300 MW of generation capacity.

- As described in **Section 4.0** the NSIESO will be responsible for future renewable energy procurements, if needed, following the completion of the Green Choice Program and Community Solar procurements that are currently underway.

NS Power is committed to supporting the transition of accountabilities to the NSIESO in collaboration with NRR.

The new resources identified in the 2030 Clean Power Plan were summarized in **Figure 1** below in last year's *The Path to 2030* report. These resources were updated in NS Power's 10 Year System Outlook (10YSO) report submitted to the NSUARB on June 27, 2024, and the updated timelines have been added to **Figure 1** for this year's update. With respect to resources, sizing, and timing, this update to *The Path to 2030* report is consistent with the 2024 10YSO report unless otherwise noted.

Figure 1 – 2030 Clean Power Plan Resources

	Nameplate Capacity (MW)	Initial Anticipated COD (Year)	Updated Anticipated COD (Year)
Wind & Solar Resources			
Rate Base Procurement	306	2025	2025-2026
Green Choice Program	416	2028	2028
Port Hawkesbury Paper Wind	168	2025	2026
Renewable to Retail Wind	149	2024	2026[1]
Community Solar	50	2025-2029	2025-2029[2]
Commercial Net Metering	50	2024-2029	2024-2029
Energy Storage Resources			
NS Power BESS Project	150	2025-2026	2025-2026
NSIESO Procurement	50-250[3]	2026	2027[4]
Fast Acting Generation Resources			
Stage 1	300	2027	2027
Stage 2	300	2029-2030	2029-2030
Fuel Conversions at Existing Units			
Gas Conversion – Point Tupper 2	150	2028	2028
HFO Operation – Lingan 1/3/4	459	2029	2029
Total New Wind & Solar	1,139		
Total New Energy Storage	200 - 400[3]		
Total New Fast Acting Generation	600		
Total Fuel Conversions	609		
Load Management Initiatives	150	2025-2029	2025-2029
Total Coal Phase Out	1,229		

[1]Expected COD for Renewable to Retail wind farm is now 2026. See **Section 6.1.4** for further details.

[2]2026 was listed as the first year for community solar generation additions in the 2024 10 Year System Outlook. This has been revised in this document to recognize the New Dawn project coming online in 2025. As detailed in **Section 6.1.5** the next projects under this program are not expected until 2026.

[3]Stated range is as per 2023 Clean Power Plan, actual size of additional battery capacity to be determined by NSIESO.

[4]Stated COD is as per 10 Year System Outlook, actual timing of battery capacity additions will be determined by the NSIESO

These resource additions form a comprehensive strategy that allows for flexibility to accommodate future uncertainties. Through the ongoing Evergreen IRP Action Plan & Roadmap items, NS Power is closely monitoring factors which may influence the Path to 2030, including load management initiatives, electrification, and green hydrogen development. Achieving this significant transition will require the coordination and cooperation of a broad group of partners and stakeholders, including the Government of Nova Scotia, Independent Power Producers (IPPs), EfficiencyOne (E1), Mi'kmaw Partners, NS Power, and the NSIESO, when established. These parties will have various accountabilities in the development and execution of projects that will add and integrate both renewable and dispatchable resources to the grid.

2.0 INTRODUCTION

In its 2023 Annual Capital Expenditure (ACE) Plan Order (M11017) on September 12, 2023, the Nova Scotia Utility and Review Board (NSUARB, Board) directed Nova Scotia Power Inc. (NS Power, Company) to:

> 1) File a detailed and specific plan outlining how the Company will achieve the 2030 obligations, what specific steps are required to meet these obligations, how the proposed steps will accomplish that goal, and when these steps will be taken.
>
> 2) Use its best efforts to file such a plan with the 2024 ACE Plan. Keeping in mind the usual November filing of the ACE Plan. If this is not possible, the Board directs that a detailed plan be filed by December 31, 2023.

In its 2024 ACE Plan Order (M11458) on August 13, 2024, the NSUARB provided the following direction:

> 5. The Board directs that NS Power file an update on The Path to 2030 in the ACE Plan on an annual basis until 2030.

In compliance with the Board's direction, NS Power provides herein its 2024 *The Path to 2030* report, which describes the Company's plan to achieve its 2030 obligations. This document includes information regarding the following:

- The 2030 Decarbonization Goals
- The Province of Nova Scotia's 2030 Clean Power Plan
- Creation of the Nova Scotia Independent Energy System Operator (NSIESO)
- Resource Development Plan elements necessary to achieve the 2030 Clean Power Plan
- NS Power Integrated Resource Plan (IRP) Action Plan and Roadmap Items supporting the 2030 Decarbonization Goals
- Project Accountabilities, Coordination, and Risk Management considerations

Details related to these topics will provide greater specificity with respect to how the Company will meet its 2030 obligations, including more specific timelines for each element of its plan to do so.

3.0 2030 DECARBONIZATION GOALS

NS Power's 2030 decarbonization goals are mandated under several legislative and regulatory frameworks. Although there are many environmental regulations that apply to NS Power's planning and operating environment, the key items relating to planning for and achieving the 2030 obligations are described below. In this year's report there is no change to the details in **Section 3.1** 80 Percent Renewable Electricity Sales and **Section 3.2** Coal Phase Out.

3.1 80 Percent Renewable Electricity Sales

The Province of Nova Scotia amended the Renewable Electricity Regulations[1] on July 9, 2021. The amendment added a Renewable Electricity Standard for 2030 which provides that:

- Beginning in calendar year 2030, load-serving entities must supply customers with 80 percent renewable electricity.

- NS Power must acquire at least an additional 1,100 GWh from independent power producers to meet this new requirement.

- NS Power may incorporate contributions from renewable low-impact electricity acquired from a source outside Nova Scotia.

This requirement was incorporated into the most recent Evergreen IRP and is considered in the 2030 Clean Power Plan.

[1] N.S. Reg. 110/2021.

3.2 Coal Phase Out

The Province of Nova Scotia introduced the *Environmental Goals and Climate Change Reduction Act*[2] on October 27, 2021, and the legislation received Royal Assent on November 5, 2021. This Act includes the following elements that influence NS Power's system planning requirements:

- To have 80 percent of electricity sales in the Province supplied by renewable energy by 2030.

- To phase out coal-fired electricity generation in the Province by the year 2030.

In addition to the provincial goal to phase out coal-fired electricity generation by 2030, the federal Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations[3] prescribe various regulations on coal generating units, including a requirement to stop generating with coal by the year 2030. The requirement to phase out coal by 2030 was incorporated into the most recent Evergreen IRP and is considered in the Province of Nova Scotia's 2030 Clean Power Plan, described below.

3.3 Proposed Clean Electricity Regulations

In addition to the policies described above, NS Power is considering the proposed Clean Electricity Regulations (CER)[4] as part of its long-term planning. These regulations, commencing in 2035, will regulate the electricity sector in Canada toward achieving net-zero emissions by 2050. Multiple drafts of these regulations have been released by Environment and Climate Change Canada and NS Power has been engaged with Environment and Climate Change Canada (ECCC) through their stakeholder engagement process. As part of this engagement, the Federal

[2] S.N.S. 2021, c. 20.
[3] Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations (justice.gc.ca) (SOR/2012-167).

[4] Canada Gazette, Part I, Volume 157, Number 33: Clean Electricity Regulations.

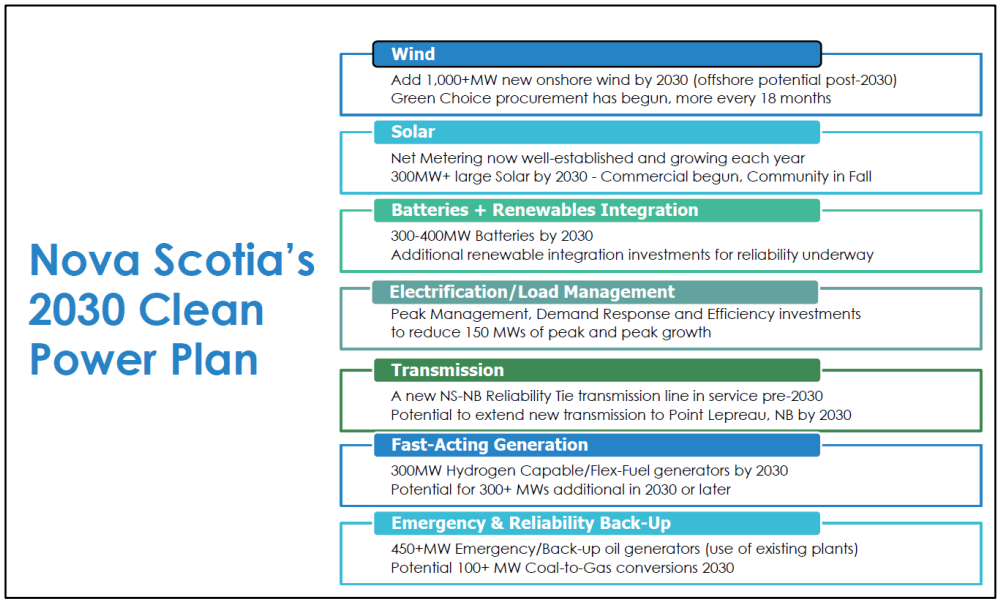
Government announced on September 16, 2024 that a common understanding was achieved with the Government of Nova Scotia on the CER: the future CER will provide flexibilities to enable system growth and support decarbonization in the Province while ensuring reliability for customers.[5] NS Power incorporated an earlier (pre-Canada Gazette 1) draft of the CER into its 2022-2023 Evergreen IRP modeling and accordingly this draft was considered in the IRP Findings and Action Plan. NS Power will continue to monitor developments of the CER through to the end of 2024 and the final release of the CER in Canada Gazette 2. ECCC has and continues to acknowledge the requirement for emitting resources operating in a peaking capacity as part of the CER, which is in alignment with NS Power's long-term strategy.

[5] https://www.canada.ca/en/natural-resources-canada/news/2024/09/ensuring-access-to-affordable-reliable-secure-and-non-emitting-electricity-in-nova-scotia.html

4.0 NOVA SCOTIA'S 2030 CLEAN POWER PLAN

On October 11, 2023, the Province of Nova Scotia released the 2030 Clean Power Plan.[6] This release detailed the new resources that have been identified by the provincial government as being required to meet the 2030 decarbonization goals. A summary of the 2030 Clean Power Plan is shown in **Figure 2** below.

Figure 2 – Nova Scotia's 2030 Clean Power Plan (October 2023)



[6] nova-scotia-clean-power-plan-presentation-en.pdf (novascotia.ca)

5.0 NOVA SCOTIA INDEPENDENT ENERGY SYSTEM OPERATOR

In February 2024, the Clean Electricity Solutions Task Force, a task force commissioned by the Nova Scotia provincial government, submitted its final report titled, "Modernizing Energy from Transition to Transformation."[7] This report identified several recommendations for the electricity sector including the creation of an independent energy system operator and stand-alone energy regulator. On April 5, 2024, The Energy Reform Act - Bill 404 received Royal Assent in Nova Scotia, which in turn enacted the *More Access to Energy Act* (MAEA). The MAEA, amongst other things, mandates the creation of the Nova Scotia Independent Energy System Operator (NSIESO). At this time, it is broadly understood the NSIESO will be responsible for resource and transmission system planning and energy resource procurement.

Since the announcement that an independent system operator will be established, the Department of Natural Resource and Renewables has confirmed to NS Power the NSIESO will be responsible for several components of the Clean Power Plan:

- Any future Battery Storage procurements will be scoped and procured by the NSIESO.

- All Fast-Acting Generation projects will be procured by the NSIESO, including responsibility for the first 300 MW of generation capacity.

In addition, the NSIESO will be responsible for future renewable energy procurements, if needed, following the completion of the Green Choice Program and Community Solar procurements that are currently underway.

The accountability Matrix in **Section 8.1** has been updated to reflect these changes. Accordingly, NS Power anticipates that the NSIESO, once established, will play a significant role in planning and execution of various elements of the Path to 2030 as described in this Plan. NS Power is

[7] https://cetaskforce.ca/wp-content/uploads/2024/02/Report-February-23-2024-Final-Signed.pdf

committed to supporting the transition of accountabilities to the NSIESO in collaboration with NRR.

6.0 RESOURCE DEVELOPMENT PLAN ELEMENTS

6.1 Wind and Solar Resources

The 2030 Clean Power Plan incorporates a significant quantity of new variable renewable generation which must be added to the grid by 2030. The required renewable energy projects will be procured by the Province of Nova Scotia, and in the future by the NSIESO, via multiple streams, with NS Power supporting each of these as required. Updates on each procurement stream are provided below, including next steps and timing for each project stream.

6.1.1 Rate Base Procurement

The Rate Base Procurement (RBP) program was initiated by the Province of Nova Scotia in 2021. The goal of the RBP was to contract for 1100 GWh of low-impact renewable electricity per section 6B(2)(b) of the Renewable Electricity Regulations[8] as part of meeting NS Power's 2030 Decarbonization Goals.

The RBP involved a comprehensive renewable procurement managed by the Province of Nova Scotia's Procurement Administrator, Coho Climate Advisors (Coho). NS Power supported the procurement process by:

- Completing over 35 Feasibility (FEAS) Studies under the Generator Interconnection Procedures (GIP) in support of proponent bids.

- Providing feedback and participating in the NSUARB regulatory process to approve the RBP Power Purchase Agreement (PPA).

- Providing feedback on the draft Request for Proposals (RFP).

[8] N.S. Reg. 155/2010 as amended to N.S. Reg. 338/2022.

The RBP Portfolio was announced on August 17, 2022 and subsequently updated on July 12, 2023 and February 8, 2024. The RBP Portfolio initially included five (5) projects representing a total of 373 MW and 1,478 GWh of new wind generation to the Nova Scotia system. Since that initial portfolio was announced, one of the projects awarded a PPA withdrew from the program and a potential replacement project will not proceed under the RBP program. The RBP Program now includes four (4) projects totaling 306MW and 1,165 GWh of wind generation. The advancing projects are:[9]

- IR 673 - Benjamins Mill Wind near Falmouth in Hants County, developed by Natural Forces Development and Wskijnu'k Mtmo'taqnuow Agency Ltd, an organization which represents the 13 Mi'kmaw Nations in the province.

- IR 669 - Higgins Mountain Wind Farm near Wentworth in Colchester and Cumberland counties, developed by Elemental Energy and Sipekne'katik First Nation.

- IR 668 - WEB Weavers Mountain Wind near Marshy Hope in Pictou and Antigonish counties, developed by SWEB Development and Glooscap First Nation.

- IR 677 - Wedgeport Wind Farm in Yarmouth County, developed by Elemental Energy and Sipekne'katik First Nation.

Through 2024, NS Power has been supporting the RBP Portfolio projects in moving through the GIP. GIP status for the RBP projects is summarized in **Figure 3** below.

[9] https://novascotiarbp.com/updates

Figure 3 – RBP Project GIP Status

	SIS PART 1	SIS PART 2	FACILITY STUDY	GIA	COD
IR 673 Benjamins Mill	Complete	Complete	Complete	Executed	Oct 15, 2025
IR 669 Higgins Mountain	Complete	Complete	Complete	Executed	Jan 26, 2026
IR 668 Weavers Mountain	Complete	Complete	Complete	Executed	Dec 31, 2026
IR 677 Wedgeport	Complete	Complete	Complete	In Progress	TBD

NS Power is planning for the development of associated Network Upgrades and Transmission Provider Interconnection Facilities for these projects.

6.1.2 Green Choice Program

The Green Choice Program (GCP) was established in April 2022 following amendments to the *Electricity Act.*[10] The goal of the GCP is to procure a minimum of 1500 GWh, and up to 2000 GWh, of new low-impact renewable electricity for which large-scale energy customers can contract to achieve their greenhouse gas emissions reduction targets while supporting the Province's 2030 decarbonization goals, per section 6B(3)(a) of the Renewable Electricity Regulations and per section 24 of the Green Choice Program Regulations.

As a voluntary corporate renewables program, GCP enables large energy consumers (with ≥10,000 MWh of annual load) or aggregated partnerships (with ≥1,000 MWh of annual load, individually, and with an annual minimum subscribed energy of 10,000 MWh) to subscribe up to 120 percent of their annual load to the renewable energy generation projects selected through the RFP process. The Green Choice Program procurement will solicit sufficient new renewable electricity to serve the subscribed load on an annual basis. NS Power will be responsible to continue to plan and operate the system such that it has sufficient capacity available to supply the subscribed load.

[10] S.N.S. 2022, c. 12.

The GCP involves a renewable electricity procurement managed by the Province of Nova Scotia's Procurement Administrator, Coho, and a tandem participant intake process managed by the provincial department of Natural Resources and Renewables (NRR), Coho, and with support from NS Power. To date, NS Power has supported the program development by:

- Providing feedback and input on the Participant Guide.
- Development of frequently asked questions (FAQs) for participants, specific to Renewable Energy Credits (RECs), published on the GCP website.
- Providing feedback on the draft Request for Proposals (RFP) and the Power Purchase Agreement (PPA), including participation in the public feedback process.
- Providing feedback on materials and attending and being available for questions during both participant and proponent webinars.
- Development of near-term forecast carbon cost on a variable (dollar-per-MWh) basis for publishing on the GCP website.
- Providing feedback, as requested, on participant resources, educational and support materials, and participant agreement/terms and conditions.
- Providing feedback on the draft participant application form and guide.
- Providing feedback on the draft Participant Agreement.
- Completing twenty-one feasibility studies as part of the Generation Interconnection Process for prospective GCP candidates

On December 1, 2023, Coho issued the RFP associated with the GCP. Final bids closed in June 2024. In August 2024, proponents electing to opt-in to Canda Infrastructure Bank (CIB) financing were asked to re-submit pricing, with CIB financing assumed, by October 11, 2024. NS Power understands that proponents selected to be part of the GCP portfolio will be announced after government transition, following the provincial election held on November 26, 2024, is complete. Consistent with requirements under the *Electricity Act*, NS Power shall procure all electricity under a contract awarded by a procurement administrator. Projects selected as part of the GCP portfolio are expected to commit to a commercial operation date (COD) on or before December 31, 2028.

While the Green Choice Program procurement is open to various types of renewable generation, it is anticipated that the majority of the projects selected will be wind energy projects.

NS Power will continue support of the Green Choice Program development by:

- Continuing to collaborate with NRR and Coho regarding details of the program administration and customer support processes.
- Verification of applicant consumption data and account status.

Like the RBP projects, once the procurement is complete and PPAs are awarded, NS Power will support the development of these projects via the completion of System Impact Studies (SIS) and Facilities Studies, and development of Transmission Provider Interconnection Facilities and Network Upgrades associated with each project. In response to the latest GCP award timeline, and to ensure that projects awarded a PPA are able to enter the SIS process quickly following selection, NS Power has added an additional study group to the SIS Study Calendar in early 2025 to match the anticipated ability of projects to reach the appropriate GIP milestones.

6.1.3 Port Hawkesbury Paper Wind (IR 618 and IR 742)

Port Hawkesbury Paper Wind (PHP Wind), a sister company to Port Hawkesbury Paper, is pursuing the development of a proposed 168 MW wind farm to support the long-term sustainable operation of the paper mill. The environmental assessment for this project was approved by the provincial government in March 2023, and groundbreaking for this project occurred in September 2024.[11] PHP Wind forecasts commercial operation to start in the fourth quarter of 2026.

NS Power has been supporting the PHP Wind project as it moves through the GIP. There are currently two IRs associated with the project. Goose Harbour Lake I (IR 618) and Goose Harbour Lake II (IR 742). GIP status for the PHP Wind project is summarized in **Figure 4** below:

[11] https://www.cbc.ca/news/canada/nova-scotia/port-hawkesbury-paper-building-guysborough-county-wind-farm-1.7327216

Figure 4 – PHP Wind Project GIP Status

	SIS Part 1	SIS Part 2	Facilities Study	GIA Executed
IR 618 Goose Harbour Lake I	Complete	Complete	Complete	Executed
IR 742 Goose Harbour Lake II	In Progress	In Progress	Pending	Pending

6.1.4 Renewable to Retail

The Renewable to Retail (RtR) electricity market was established in Nova Scotia in 2016 to enable independent licensed retailers to sell renewable energy generated within the Province directly to NS Power's retail customers. One Licensed Retail Supplier (LRS) licence has been granted to provide service under the RtR tariffs.

In the Company's 2022 Load Forecast Report, which was the load forecast used in the development of the Evergreen IRP, 29 GWh of energy sales was forecast to be supplied under the RtR tariff. In the 2023 and 2024 Load Forecast Reports the volume of sales supplied through the RtR tariff increased to 130 GWh and 250 GWh, respectively. NS Power's Load Forecast Report provides details of how these forecasts have been developed and these will continue to be updated as part of NS Power's load forecasting process. While not explicitly considered in the Evergreen IRP, this increase in expected wind generation is consistent with the 2030 Clean Power Plan. The customer load represented by RtR is in-province load and wind generation built to meet this load is aligned with the need for new wind generation to meet the 2030 Decarbonization Goals.

The Path to 2030 and NS Power's 2024 10 Year System Outlook contain 148.5MW of new wind generation proposed to supply RtR customers (IRs 597 and 675), and the first commercial operation is now anticipated in 2026. On November 1, 2024 the LRS submitted a request to the Board to extend the license holder deadline to sell renewable low-impact electricity to customers

to December 31, 2026. On November 12, 2024 the Board issued an Order approving the request to extend the deadline (M10293).

In addition to these two interconnection requests, two additional requests, IR 739 (90 MW) and IR 785 (223 MW), associated with RtR program have active transmission interconnection requests and NS Power is supporting their progress through the GIP. The GIP status for RtR projects is summarized in **Figure 5** below.

Figure 5 - GIP Status for RtR Projects

	SIS PART 1	SIS PART 2	FACILITY STUDY	GIA
IR 597 Mersey Wind 1	Complete	n/a*	Complete	Executed
IR 675 Mersey Wind 2	Complete	Complete	Complete	In Progress
IR 739 Greenfield Wind	In Progress	In Progress	Pending	Pending
IR 785 West Wind Farm	Feasibility Study Complete			

*IR 597 was completed in SIS Group 30, prior to the requirement for EMT analysis that is completed during SIS Part 2. The requirement for a SIS Part 2 study is applicable to SIS Groups 32 – 34, where NS Power worked to provide the load flow and dynamic analysis under SIS Part 1 in advance of the EMT analysis in Part 2 to assist interconnection customers with project development. Starting in SIS Group 35, the reports will be combined into a single SIS Report containing load flow, dynamic, and EMT analysis.

6.1.5 Community Solar Program

The Community Solar Program launched in Q1 2024, following proclamation of amendments to the *Electricity Act*[12] and the registration of the Community Solar Regulations. The program was first conceived in April 2022, when the Government of Nova Scotia passed amendments to the *Electricity Act* (in SNS 2022, c 12, s 5) that enable a Community Solar Program, administered by NS Power, pending the Order in Council that came earlier this year. The Province's stated goal[13]

[12] S.N.S. 2022, c. 12, s 5.
[13] Action 18 contained within "Our Climate, Our Future – Nova Scotia's Climate Change Plan for Clean Growth" available at https://climatechange.novascotia.ca/sites/default/files/uploads/ns-climate-change-plan.pdf

for the Community Solar Program is to enable at least 50 MW of new community solar generation and facilitate equitable access to renewable energy, including for those otherwise unable to install on-site renewables through either Commercial Net Metering or the self-generating option.

The program will encourage the development of new community solar gardens with a project nameplate capacity of between 0.5 MWac and 10 MWac. Each community solar garden project is built, owned, and operated by an eligible project owner which may include municipalities, towns, First Nations, not-for-profits, towns/townships and villages, business, co-operative, colleges and universities, or a partnership within the aforementioned. The program capacity for all community solar gardens combined is 100 MW.[14]

In order to enable the Community Solar program two regulatory proceedings are before the Board. The provincial department of NRR filed the Community Solar PPA (M11903) with the NSUARB on September 25, 2024 and NS Power filed the Community Solar Energy Credit Rider (M11911) with the NSUARB on October 1, 2024. These proceedings are expected to conclude in Q1 2025 and will enable solar gardens to enter into PPA's with NS Power and customers to subscribe to the program.

The first project, a 0.585 MW community solar garden located at Pine Tree Park Estates in Sydney, Cape Breton has 29 residential and commercial subscribers and is anticipated to be enrolled in the program following the conclusion of the regulatory process. NS Power anticipates the next projects will come online no sooner than Q1 2026 and the majority will be connected to the distribution system.

The Community Solar Program is a rolling application intake managed by the provincial department of NRR. Once a project is approved by the Minister, the Project is awarded a PPA and can enter into a Distribution System Impact Study (DSIS) study window for the Distribution Generation Interconnection Procedure (DGIP).

[14] Nova Scotia Department of Natural Resources and Renewables, "Nova Scotia Community Solar Program Guide." February 2024. Accessed at: https://energy.novascotia.ca/sites/default/files/community-solar-program-guide.pdf

NS Power will administer the program billing and assist project owners in subscriber management. To date, NS Power has supported the program development by:

- Providing feedback and input on the Community Solar Program Guide and Program Application.
- Providing feedback and input on the PPA.
- Development and submission of the Community Solar Energy Credit Rider.
- Providing feedback on materials and attending and being available for questions during webinars.
- Providing feedback, as requested on participant resources, educational and support materials for both programming and interconnection.
- Development of program administration and processes within NS Power.
- Filing the Community Solar Energy Credit Rider (M11911) with the NSUARB on October 1, 2024, along with a letter of support from NRR.
- Completing preliminary assessments for distribution generation interconnect requests.

As of November 25, 2024, NS Power has completed 40 preliminary assessments in 2024 for potential projects under the Community Solar program. Eight additional preliminary assessment are in progress. The 48 projects represent a total potential of 335 MW of installed capacity. Like the other renewable projects, once an application is accepted by the Minister and a PPA is awarded, NS Power will support the development of these projects via the completion of System Impact Studies and Facilities Studies, and as required, the development of Interconnection Facilities and Network Upgrades associated with each project.

6.1.6 Commercial Net Metering

April 2022 amendments to the *Electricity Act (Nova Scotia)* established the framework for a new net metering program. October 2022 amendments to the *Renewable Energy Regulations*[15] required that NS Power develop and apply to the NSUARB for approval of the new program by November 2022. NS Power received Board approval for the new Commercial Net Metering Program (CNMP) in July 2023. In August 2023, CNMP was made available for Class 1 Service (installations greater than 27 kW up to 100 kW) and, in October 2023, for Class 2 Service (installations greater than 100 kW up to 1 MW).

CNMP enables customers to generate renewable electricity from a variety of eligible sources (e.g. solar, wind, hydro) for their own use and to export excess electricity to NS Power. Energy exported to NS Power is banked and applied to the customer's next bill to offset energy drawn from the grid until the end of the calendar year. Customers participating in CNMP remain on their existing tariff and exported/banked energy is applied at a rate equivalent to the rate paid for electricity up to a maximum of the customer's total billed electricity within the same calendar year. In comparison to the legacy Net Metering program (under NS Power's Regulation 3.6), CNMP provides an expanded nameplate capacity limit (up to 1 MWac).

NS Power filed the first annual CNMP Report on March 31, 2024, which included the following highlights, as of December 31, 2023:

- 371.9 kW of solar PV installed with an estimated annual output of 400.7 MWh.
- 1,763.9 kW of additional solar PV pending installation with an expected annual output of 1,936.1 MWh.
- 93 percent of requests were for Class 1 Commercial Net Metering Service (Generators up to 100 kW).

[15] N.S. Reg. 338/2022.

- 7 percent of requests were for Class 2 Commercial Net Metering Service (Generators greater than 100 kW up to 1 MW).
- 3 percent of requests were for generators having a nameplate capacity greater than 200 kW (Nameplate capacity group 2).

As of November 25, 2024, NS Power has completed 21 preliminary assessments in 2024 for potential projects under the CNMP. Two additional project preliminary assessment are in progress. The 23 projects represent a total potential installed capacity of 8.9 MW.

6.1.7 Additional Renewable Energy Procurements

The projects and programs identified above total approximately 1000 MW of new wind generation and over 100 MW of new solar generation (depending on program uptake) beyond what is already in service on the Nova Scotia grid, all of which are anticipated to be in service by 2030. This represents a significant portion of the total resources identified in the 2030 Clean Power Plan as being required to meet 2030 Decarbonization Goals.

The Nova Scotia 2030 Clean Power Plan identifies the potential for additional procurement activities beyond those noted here to develop the remaining resource requirement; these activities are anticipated to begin in the 2025-2027 timeframe in order to provide sufficient time to reach commercial operation by 2030. The NSIESO will be responsible for new renewable procurements and procurement target(s) for these remaining solicitation(s) will be set by the NSIESO. NS Power understands that NRR and their procurement administrator, Coho, will conclude the currently active procurements for the Green Choice and Community Solar programs.

6.2 Battery Storage & Renewable Integration Resources

The 2030 Clean Power Plan calls for deployments of grid-scale storage in Nova Scotia. In 2024 150 MW of 4-hour storage capacity was approved by the NSUARB and additional storage capacity is anticipated to be added via future procurement activities.

6.2.1 NS Power Battery Storage Project (ECEI)

NS Power filed an application with the NSUARB for the Battery Energy Storage System Project on January 25, 2024 for three 50 MW, four-hour battery sites located near the following existing NS Power substations:

- 99W Bridgewater
- 132H Spider Lake
- 43V Canaan Rd (White Rock Road)

The NSUARB approved the Company's capital cost application on June 13, 2024 and the BESS project proceeded through the Decision Gate 3 governance milestone in late June, resulting in the execution of the BESS Engineering, Procurement and Construction contract with e-Storage (a subsidiary of Canadian Solar Inc.) on July 2, 2024.

Construction activities have begun on all three BESS sites. At Bridgewater, a new driveway was constructed, civil works were completed in preparation for the installation of primary interconnection equipment, and subsequently primary equipment was installed. The main power transformer for the site was delivered and placed in the substation in late September 2024. Driveway extension construction at the Spider Lake BESS site has been completed in advance of the delivery and installation of the site's main power transformer which was completed in November. The commissioning dates for the Bridgewater and Spider Lake BESS sites are Q4 2025.

Early site preparation activity for the White Rock Road BESS site has also been completed with the construction of the access driveway in December. The commissioning date for the third BESS site is Q3 2026.

Figure 6 – Main transformer installation for Spider Lake BESS site.



As directed by the Board in its Order regarding M11539, NS Power will provide a detailed interim update report to the NSUARB and stakeholders by September 30, 2025, summarizing actual project costs incurred and external funding developments relative to initial cost estimates included in the Company's capital cost application, and additional updates on the projected completion dates for the three BESS Project sites.

6.2.2 Battery Storage Procurement

On March 22, 2023, the Province introduced amendments to the *Electricity Act*[16] that provide new procurement pathways for energy storage in Nova Scotia. Specifically, the changes to the Act

[16] S.N.S. 2023, c. 17.

allow NRR to issue RFPs for energy storage solutions and contracts for well-developed, innovative energy storage projects that can be implemented quickly.[17]

The amendments provide two pathways for new energy storage projects to be designated by the Province:

- Energy Storage Procurements may be initiated under Section 4B of the Act.
- Energy Storage Projects may be prescribed under Section 4D (2) of the Act.

In last year's The Path to 2030 update, NS Power anticipated that up 150 MW of energy storage capacity may be designated, in the near term, by the Province under Section 4D and an additional 100 MW of energy storage capacity would be procured by the Province under Section 4B. Since that update the Province has confirmed to NS Power that all future energy storage capacity additions will be procured through a competitive process to be led by the NSIESO. The quantity of energy storage capacity added via procurement and the timing of new energy storage additions is expected to be determined by the NSIESO.

6.2.3 Grid Stability & Renewable Integration Resources

The transition from a traditional power system, largely made up of synchronous generators, to a power system which will rely heavily on inverter-based resources (IBRs) such as wind, solar, and battery energy storage, will require new sources of grid support to maintain the stability, reliability, and power quality of the transmission system.

On December 8, 2023, NS Power released its report *Large Scale Integration of Inverter Based Resources in Nova Scotia*[18] (Integration Report) as part of its IRP Action Plan. The report identified key metrics for Frequency Control and System Strength which are incorporated into system studies where grid stability issues are identified, mitigation options are assessed, and

[17] Electricity Act Amendments Allow More Energy Storage Solutions - Government of Nova Scotia, Canada
[18] Wind-Integration-Study-Large-Scale-Integration-of-IBR-in-Nova-Scotia-Public.pdf (nspower.ca)

mitigations are incorporated into grid design and specifications. Mitigation options identified in the report and under assessment include:

- IBR Control System Design
- Battery Energy Storage Systems
- Synchronous Condensers
- Flexible AC Transmission System (FACTS) Devices, Static Var Compensators (SVCs), Static Synchronous Compensators (STATCOMs), Switched and Static Capacitor Banks
- Fast-Acting Synchronous Generation
- Transmission Connections
- Operating Guidelines

Mitigation options, such as those identified in the bullets above, will be needed to support both existing and new inverter-based resources to allow for maximum integration of IBR in Nova Scotia while maintaining grid stability and reliability. Updates on BESS (see **Section 6.2.1**), Reliability Tie (see **Section 6.3**), and Fast Acting Generation (see **Section 6.4**) are provided separately in this report.

NS Power is also advancing a synchronous condenser project in alignment with The Path to 2030. On January 16, 2024 the Minister of NRR issued a directive to NS Power to provide equipment and systems necessary to supply the inertia response required to maintain the stability, reliability, and power quality of the transmission system for interconnection by wind energy conversion systems (WECS) procured pursuant to Sections 4B (1) (a), (b), and (e) of the Electricity Act. At this time, four Interconnection Customers fall under this directive (please refer to **Figure 3**). NS Power has prioritized, for first installation, the inertial support for Benjamin's Mill and Wedgeport based on the studied grid conditions near those wind farms. NS Power has:

- Prioritized the four sites based on local grid conditions.
- Identified locations at existing NS Power substations near the first two sites.

- Developed a procurement approach for the synchronous condenser equipment.
- Initiated substation design activities to accommodate the synchronous condensers.

This project has been included in the 2025 ACE Plan as a project for subsequent submission (C0065943 – ECEI Synchronous Condenser). In addition to synchronous condensers supporting wind farms, centralized synchronous condensers are anticipated to be required as large thermal units are retired or not required online as wind generation online increases. System studies are ongoing to determine the optimal sizing and location.

6.3 Reliability Tie

The Reliability Tie is a second 345 kV AC transmission line between Onslow, NS and Salisbury, NB. It will improve the reliability of Nova Scotia's transmission link to the New Brunswick Power (NB Power) system and the broader Eastern Interconnection, enabling the integration of additional variable renewable generation on the Nova Scotia system. The Reliability Tie is not anticipated to provide incremental access to firm capacity or energy. NS Power is developing the Reliability Tie in collaboration with NB Power with a target in-service date in 2028, in alignment with the 2030 Clean Power Plan.

6.3.1 Update on Reliability Tie Project (ECEI)

The Reliability Tie Project continues to progress toward its target in-service date. The Company has provided recent project progress updates in the 2024 IRP Action Plan Update and the 2024 10-Year System Outlook proceeding. Below is a summary of the progress made on the Reliability Tie Project in 2024:

- Significant progress has been made on the Intertie Project's Development Agreement with NB Power. Coordination activities with the NB Power team on advancing pan-project matters (e.g. quality management, project controls and integrated schedule refinement)

have ramped up in 2024. A focused effort on setting up project processes and procedures for both teams will continue into the first two quarters of 2025.

- Environmental Assessment (EA) Filing: NS Power received approval for the EA of the Nova Scotia portion of the Reliability Tie Project in December 2023. Follow-up studies to support the EA conditions are progressing on schedule. The Company's Environmental Protection Plan for the Project is on track to be submitted to NS Environment and Climate Change in late Q4 2024 or early Q1 2025.

- Mi'kmaq Engagement: NS Power and the KMKNO signed a Collaboration Agreement on the building of the intertie in Q4 2023. Regular engagement continues with the Benefits Coordinator and the Implementation Committee for the Agreement to highlight opportunities for First Nations employment and businesses to participate in the project. The KMKNO have completed a review of the Project Environmental Protection Plan and provided their feedback October 17, 2024. NS Power is working to address their feedback.

- Engineering and Procurement: Detailed design is complete or near completion for all segments of the project. All major RFPs for the materials and construction services required to execute the project have been released to market as of October 22, 2024. Proposal evaluations are on track to occur in Q4 2024 and Q1 2025 with final contract awards contemplated for later in 2025.

- Stakeholder Engagement: NS Power, in coordination with NB Power, has continued its stakeholder engagement process with outreach to stakeholders, special interest groups and municipalities in which the projects will be constructed in both provinces. NS Power continues to meet with stakeholder groups (for example, the blueberry industry) to provide information about the planned work and how they may be affected.

- Project Right of Way (ROW): Progress on land easements and rights of way in Nova Scotia is progressing as planned and reaching completion. NB Power is on track to ramp up project

work related to land easements and rights of way for the New Brunswick portion of the line in late 2024.

Key preliminary engineering activities continue on the Project and NS Power anticipates bringing forward a capital application in Q1 2025.

6.3.2 Stage 2

The 2030 Clean Power Plan notes the potential for the Reliability Tie to incorporate a Stage 2 transmission build from Salisbury NB to Point Lepreau NB, to enable greater access to New Brunswick, New England, and Quebec energy imports and exports. This extension would also be accompanied by additional upgrades within Nova Scotia such as the conversion of L-7018 230 kV line to 345 kV (120H-Brushy Hill to 67N-Onslow) and additional transformation capacity at 67N-Onslow. This approach is consistent with IRP Action Plan Item 1b that identifies the need to continue working with neighbouring jurisdictions in support of opportunities for regional integration and was also identified in the Province of New Brunswick's report, *Powering our Economy and the world with Clean Energy – Our Path Forward to 2035.*.[19]

Future studies for Stage 2 are anticipated to include detailed engineering and economic studies for firm import options requiring new transmission investment and strengthened regional interconnections. This work is anticipated to continue in 2025 in parallel with the development of the Reliability Tie from Onslow NS to Salisbury NB.

[19] https://www2.gnb.ca/content/dam/gnb/Corporate/Promo/energy-energie/GNB-CleanEnergy.pdf

6.4 Fast-Acting Generation

The 2030 Clean Power Plan identifies a need for up to 600 MW of new fast-acting generation by 2030. The need for new fast-acting generation capacity was also confirmed in the Evergreen IRP analysis and it was included as part of Action Item #3c in the August 2023 update to the IRP Action Plan and Roadmap. The IRP Action Plan is clear that a significant increase in system firm capacity is required to maintain supply reliability while meeting growing peak demand requirements and replacing firm capacity that will be retired to comply with the 2030 coal phase-out policy requirements.

6.4.1 Project Approach & Next Steps

NS Power had been developing a fast-acting generation project through 2024 in alignment with both the 2030 Clean Power Plan and the IRP Action Plan. Site selection was developed, milestone schedules, initial cost estimates, and interconnection Feasibility Studies were completed.

In a meeting on September 27, 2024, the Department of Natural Resources and Renewables informed NS Power that the responsibility for procurement of all new fast acting generation will be that of the NSIESO, including responsibility for the first 300MW of generation. NS Power is currently in discussion with the Department on how project elements may be transferred to the NSIESO, including appropriate cost recovery.

6.5 Fuel Conversions at Existing Units

The 2030 Clean Power Plan includes alternate fuel operation at four of NS Power's existing thermal units. Similarly, the Evergreen IRP identified that alternate fuel operation at four units was a common resource plan element across IRP scenarios, and these were included in the IRP Action Plan under item #3e.

6.5.1 Gas Conversion at Point Tupper Generating Station

In all scenarios modeled as part of the Evergreen IRP, the coal-to-natural-gas conversion of Point Tupper Generating Station Unit 2 (150 MW) was observed as a common outcome. This converted unit is shown to be operated in a peaking capacity (with low annual capacity factors) during periods of net peak demand to support system reliability and to meet customer demand. NS Power will be progressing the completion of the coal to gas conversion by 2028 in alignment with the phase-out of coal generation for the Point Tupper unit and the Clean Power Plan.

The coal-to-gas conversion was also a finding of the 2020 IRP and demonstrated value to the system in a peaking capacity. As a result (and reflected in the 2020 IRP roadmap), a coal-to-gas conversion project was initiated and engineering design/economic assessment work was completed to further evaluate the project scope and value. In parallel, NS Power continued to evaluate options for supply of natural gas to the site. This work will serve as a starting point for the advancement of the coal-to-gas conversion project.

To enable the coal-to-gas conversion by 2028, the NS Power team is developing milestones and project timelines for engagement, the regulatory process, and design/commissioning. This work will continue in 2025.

6.5.2 HFO Operation at Lingan Generating Station

Transition to the peaking use of Heavy Fuel Oil (HFO) for Lingan units 1, 3 and 4 (approximately 450 MW total) was identified in the 2030 Clean Power Plan. It was also a consistent outcome across all Evergreen IRP scenarios. This was a new finding as compared to the 2020 IRP, the value of which is supported by the low capital cost (these units already operate on HFO) and the ability for these units to operate in a peaking capacity during periods of net peak demand.

The timing for the transition to heavy fuel oil for Lingan 1, 3 and 4 was a consistent outcome of the Evergreen IRP as well (2028-2030) and is in alignment with the timing of the phase-out of coal

generation for the three units. It is also consistent with the recognized need for dispatchable capacity, including both gas and liquid fueled units, which was acknowledged as part of the development of the draft CER.

To achieve the necessary timing to enable the 2030 plan, the NS Power team is developing milestones and project timelines for engagement, the regulatory process, and design/commissioning. Due to the timing of these conversions, no significant activity is anticipated to be undertaken in 2025.

6.6 Coal Generation Phase-Out

The significant addition of new resources described above is designed to both enable coal phase-out and support the forecast of continued load growth on the system. In parallel with these resource additions, NS Power analyzed the timing of coal unit retirement and conversion as part of the Evergreen IRP process in 2023. The IRP scenarios determined it was optimal to retain coal units for firm capacity as late as the model allows with retirements and/or fuel switching occurring later in the 2020s.[20]

The coal unit retirement and phase-out dates provided in the 2024 10-Year System Outlook represent NS Power's best estimate of when sufficient new resources will be added to the system to offset retiring coal capacity, support increasing firm demand, and maintain supply reliability for customers. The retirement dates in the 2024 10 Year System Outlook were pushed out for a couple of units in part due to the increase in forecast firm demand in the 2024 Load Forecast and the need to retain sufficient generation capacity to meet this demand. These updates include aligning the retirement of Lingan 2 and Trenton 5 with the first round of new fast acting generation additions and aligning the retirements of Trenton 6 and Point Aconi with the second round of fast acting generation additions. These dates are summarized in **Figure 8** below.

[20] Nova Scotia Power Evergreen IRP (nspower.ca); page 6

Figure 7 – Coal Retirement and Conversion Dates as reported in the 2024 10-Year System Outlook Report

Unit	Initial The Path to 2030 Forecast	2024 10YSO Update	Notes
Lingan 1	2029	2029	Converted to HFO operation (reliability resource)
Lingan 2	2025	2027	Currently operating in Cold Reserve
Lingan 3	2029	2029	Converted to HFO operation (reliability resource)
Lingan 4	2029	2029	Converted to HFO operation (reliability resource)
Trenton 5	2027	2027	
Trenton 6	2028	2029	
Point Aconi	2028	2029	
Point Tupper	2028	2028	Converted to Gas operation

The dates provided above will continue to be evaluated as the timing of new resources, forecast for demand growth, and policy factors continue to change in the future. Updates will continue to be provided in the annual 10-Year System Outlook report.

As new firm capacity resources are added to the system, retaining existing thermal units in cold reserve can support commissioning, testing and establishment of reliable operations without compromising the system's planning reserve margin requirements. This will be considered and assessed as plans for new resources are progressed.

7.0 ADDITIONAL IRP ACTION PLAN AND ROADMAP ITEMS

In addition to the items identified in the 2030 Resource Development Plan, there are other elements of the broader IRP Action Plan which have specific and significant impacts on resource development requirements to 2030. These are highlighted below.

7.1 Demand Side Management

In September 2022, EfficiencyOne (E1) received approval for an investment of $173.1 million for its 2023-2025 DSM Plan activities. The plan targets 412.7 GWh and 78.8 MW in energy efficiency (EE) savings over the three-year period, and 17.9 MW of available capacity from demand response (DR) programming by the end of 2025. In its Enabling Strategies component, E1 plans to support electrification strategy development. In November 2022, the Government of Nova Scotia passed amendments to the *Public Utilities Act* under Bill 228.[21] The amendments included replacing references to "energy efficiency and conservation activities" with "demand-side management," and expanding the definition of "demand-side management" to include "strategic electrification of energy end uses […]" under Section 79A(b). Bill 228 also prescribed five-year terms for DSM purchase agreements and portfolio-level evaluation of proposed cost-effective DSM programs.

Given that DSM activities have expanded outside traditional energy efficiency, achievement of current planned investments in 2023 to 2025, and development of DSM investments in alignment with the Base DSM profile identified in the Evergreen IRP, are increasingly important to achieving the 2030 decarbonization goals.

In 2024, E1 began its 2026-2030 DSM Plan development in consultation with the Demand Side Management Advisory Group (DSMAG). In tandem, the DSMAG has been consulted on the review of the jurisdictional cost-effectiveness test and framework, and NS Power engaged with the DSMAG to update the avoided costs, using modeling built on NS Power's 2023 Evergreen

[21] S.N.S. 2022, c. 53.

IRP analysis. In December 2024, E1 will provide Round Two 2026-2030 DSM Plan model results for DSMAG review and consideration. NS Power continues to review and engage with the DSMAG on the development of the 2026-2030 Plan; it is anticipated that this will lead to an application before the NSUARB in 2025. NS Power's focus in reviewing the plan will be affordability, peak mitigation, traditionally underserved customers and strategic electrification.

7.2 Hybrid Peak / Load Management / Demand Response

As a component of NS Power's development of its electrification strategy report, it worked with its consultant Energy and Environmental Economics (E3) to prepare load and system peak load forecasts for various heating electrification scenarios. Of the heating electrification load profiles considered, the hybrid peak electrification profile emerged as an opportunity for reduction of system peak load requirements and was studied as part of the Evergreen IRP. This scenario assumes the adoption of mini-split heat pumps along with the retention of existing back up heating sources (such as oil and natural gas) to operate during the colder/peak system demand periods in the winter when heat pumps are less efficient. This potential program was discussed in NS Power's 2023 Load Forecast Report; additional details are available as part of E3's report *The Economics of Electrification in Nova Scotia* which was shared with stakeholders via NS Power's IRP website on December 8, 2023.[22] The Evergreen IRP assumptions for this program incorporate a firm peak reduction of approximately 100 MW by 2030.

To fully assess the value of the hybrid peak scenario, NS Power is committed to participating in study work to determine the corresponding cost impacts of potential customer programs (please refer to the Action Plan Item 4b). This study, with engagement and participation from multiple organizations including NS Power, will provide a balanced assessment of the cost impacts of the hybrid approach and provide the necessary information to conduct a more refined assessment of the program from an electricity system cost perspective.

[22] The Economics of Electrification in Nova Scotia (nspower.ca)

In the first half of 2024, NS Power met with NRR on their approach to a Hybrid Peak study as part of the Load Management initiative of the Clean Power Plan. Net Zero Atlantic initiated a study to examine Hybrid Peak options in the fall of 2024 on behalf of NRR. The study will include key stakeholders within the province including E1 and organizations representing fossil fuel heating sources used in Nova Scotia. NS Power has agreed to complete resource planning modeling in support of the study objectives. NS Power understands that the current estimated timeline for completion of the study is Q3 2025.

In addition to the electrification strategy, the outcome of the 2020 IRP also pointed to the value of DR programming to reduce peak load requirements. NS Power (with support from E1) is progressing DR pilot programming with the intent of developing 75 MW of DR peak load reductions. This includes work in the areas of direct load control for residential, commercial, and industrial classes as well as NS Power's ongoing time varying pricing pilot program.

On September 23, 2024, NS Power received approval for its 2024/25 TVP Tariffs (M11822) inclusive of a new multi-unit residential building (MURB) time-of-use (TOU) pilot tariff. Recruitment for the 2024/25 season is in full swing, targeting 13,000 participants across Domestic, Small General, and General TOU and critical peak pricing (CPP) tariffs, and 1,000 units for the MURB TOU Pilot Tariff. The stakeholder engagements for the 2024/25 season kicked-off on November 27, 2024, beginning with an online session covering the Year Three Evaluation Report (M11823) and draft work plan (2024/25 Areas of Focus) for stakeholder review and comment.

During the Winter 2023/2024 period, DR events were scheduled by NS Power through E1's Smart Synergy Commercial & Industrial Aggregator DR program and new Eco Shift DR pilot program. 2023/24 season enrollment, as presented in E1's Q2 2024 Demand Side Management Report,[23] totaled 77 participants in the Smart Synergy program and 350 participants (1,257 smart thermostats and 48 electric vehicles) in the Eco Shift pilot. Recruitment is underway for the 2024/25 season, which includes additional Eco Shift eligible bring-your-own devices (mini split heat pump smart

[23] Q2 2024 Demand Side Management Report, filed by E1 on Aug 26, 2024 to the NSUARB, Page 19-21.

thermostats and residential batteries). The direct-installation water heater controller program that was paused for the 2023/24 season has been integrated into the Eco Shift pilot as a direct-installation water heater controller offering for the 2024/25 season.

Additionally, NS Power recently completed its Smart Grid Nova Scotia (SGNS) project, submitting its final report to the NSUARB on March 15, 2024 (M11621). Following a Board established written hearing proceeding regarding the report, the NSUARB provided its decision letter on October 28, 2024. The Board directed NS Power to proceed with the development of a DER integration roadmap with engagement from stakeholders and to file a progress update report no later than December 31, 2024. In the Company's update letter of November 15, 2024 regarding that matter, NS Power advised that it supports a stakeholder engagement process led by the Company. The results of the SGNS project demonstrate potential benefit in several areas regarding DER monitoring and management through a centralized DERMS platform, including with applicability to DR programming. The Company is considering future full-scale deployment options of DER with DERMS initiatives and programming, which may contribute to achieving DR targets alongside price signalling options such as the pilot TVP rates.

Updates on DR program development will continue to be provided as part of NS Power's IRP Action Plan reporting.

7.3 Green Hydrogen Projects

NS Power has had discussions with multiple potential green hydrogen project developers to understand their requirements and provide information about the Nova Scotia power system. Currently, NS Power is working with three project developers, EverWind Fuels (EWF), Bear Head Energy (BHE) and Simply Blue Group to assess their needs from both an operational and tariff perspective. EWF and BHE intend to produce green hydrogen primarily for export, while Simply Blue Group is looking at the production of green hydrogen as a feedstock for sustainable aviation fuel and renewable methanol.

Since The Path to 2030 resource plan described in this document is based on a load forecast that does not include additional capacity or energy requirements to support these large load customers, incremental resources to meet both the firm load and renewable energy needs of the developers will be required. Given the timelines and the significant load requirement, the following outlines the common approach by the developers:

- Developers will self-develop and supply renewable resources including a mix of wind, solar and battery storage (depending on the developer).
- Developers will require interaction with the Nova Scotia power grid under a new tariff structure for the following:
  - Top up in hours when their self supplied resources do not meet their firm load requirements or, in some cases, when additional resource are required to meet their load factor. Firm load requirements range between 35MW and 100MW for the prospective developers.
  - Energy sales when their self supplied resources exceed their load requirements and these additional resources are a benefit to NS Power customers.

An assessment of this within the context of the 2030 resource plan and beyond is in progress and will be continue as NS Power's understanding of future hydrogen project development potential progresses. In addition, to ensure that any future developments related to hydrogen development in the province are monitored and assessed, NS Power included Roadmap Item 11 (Hydrogen Tariff Impacts) to enable the assessment of the tariff impacts on the Action Plan as they develop.

On December 15, 2023, the Province of Nova Scotia released its Green Hydrogen Action Plan.[24] The plan includes seven goals and 23 actions to help develop the sector in alignment with the Province's climate change goals. It will support both domestic use and export of green hydrogen. The plan also identifies green hydrogen as a potential complementary fuel source for the electricity

[24] https://novascotia.ca/green-hydrogen/docs/green-hydrogen-action-plan.pdf

system that can help meet peak or emergency demand consistent with the Province's Clean Power Plan.

7.4 Offshore Wind

In September 2022, the provincial government announced a goal of leasing 5 GW of offshore wind by 2030, with specific emphasis on supporting the green hydrogen industry. Seabed lease rights for commercial scale projects are expected to be made available via a competitive commercial process beginning in 2025. First energy delivery is not currently anticipated until after 2030.

With development timelines that currently extend beyond 2030, offshore wind does not play a role in the 2030 Clean Power Plan. Offshore wind could play a part in the future of Nova Scotia's energy mix, with several paths to market available to the industry:

1. Provincial demand for clean electricity or green fuels, particularly as post-2030 renewable energy demand may increase in connection with economy-wide decarbonization.
2. Regional/national demand for clean electricity or green fuels under Canada's 2035 Clean Electricity Standard, in combination with significant transmission system expansion.
3. Demand for clean electricity from the United States.
4. International demand for low carbon, green fuels and chemical feedstock.[25]

Given the potential installed capacity (5 GW) and market opportunities for offshore wind, NS Power continues to monitor industry and local developments to inform future planning exercises.

In 2024, Net Zero Atlantic initiated the Atlantic Canada Offshore Wind Grid Integration and Transmission Study.[26] The study is understood to have a 3-year timeframe (March 2024 to March 2026) with three main phases of work. This study will develop a thorough understanding of the opportunities and challenges for integrating OSW into the Atlantic Canadian grid, both

[25] offshore-wind-roadmap.pdf (novascotia.ca)
[26] https://netzeroatlantic.ca/research/atlantic-canada-offshore-wind-grid-integration-and-transmission-study

provincially and regionally (from both a domestic and export lens). NS Power is participating in the study; the scope of work completed in 2024 included supplying data to support the development of input assumptions and scenarios that will be used by Net Zero Atlantic and their partners as part of the ongoing modeling.

8.0 PROJECT ACCOUNTABILITIES, COORDINATION, AND RISK MANAGEMENT

NS Power believes that the Nova Scotia 2030 Clean Power Plan is a comprehensive and appropriate clean energy transition plan. It is based on extensive studies and stakeholder engagement.

8.1 Project Accountabilities

Figure 9 below summarizes the role of NS Power and the Province of Nova Scotia in each of the major projects/elements of the 2030 Clean Power Plan. Overall, the NS Government is responsible for the renewable energy projects and load management to meet 2030 RES targets. NS Power is responsible for fuel conversions for existing generation units, transmission and supporting infrastructure to meet off coal targets, and integration of the procured renewable energy.

There are several changes to the figure this year reflecting changes in the Nova Scotia electricity planning landscape that occurred in 2024:

- As described in **Section 5.2.1**, future Battery Storage projects will be scoped and procured by the NSIESO.

- As described in **Section 5.4.1**, all Fast-Acting Generation projects will be procured by the NSIESO.

- The NSIESO, they will be responsible for future renewable energy procurements, if needed, following the completion of the Green Choice Program and Community Solar procurements that are currently underway.

Figure 8 – Project Accountabilities Matrix

2030 Projects	Accountability	NS Power Key Action Items	NS Government Key Action Items	Partner Key Action Items
Wind/Solar	NS Government	• Develop and own grid integration assets for projects serving base customers. • Complete interconnection studies and assets.	• Procure renewables from IPPs to reach RES targets. • Transition future procurement responsibilities to NSIESO.	• IPPs develop, construct, and operate renewable projects.
Battery Storage	NS Government and NS Power	• Procure and finance 150 MW / 600 MWh storage through utility regulated model including competitive procurements for required products and services. • Integrate IPP energy storage projects into NS Power's	• Transfer of procurement responsibilities to NSIESO.	• NSIESO to procure additional Energy Storage resources. • IPPs develop, construct, and operate additional grid-scale storage.

2030 Projects	Accountability	NS Power Key Action Items	NS Government Key Action Items	Partner Key Action Items
		processes and operations. • Complete interconnection studies and assets.		
Grid Stability and Renewable Integration Resources	NS Power	• Continue to identify required assets through IPP renewable project siting and detailed system studies. • Procure and finance through utility regulated model including competitive procurements for required products and services.	• Coordinate preferred IPP project siting based on detailed system studies. Incorporate into procurement processes.	• IPPs develop renewable projects in compliance with NS Power's Transmission System Interconnection Requirements (TSIR)
Hybrid Peak / Load Mgmt.	NS Government	• Provide detailed load studies and forecasts.	• Deliver load management initiatives through	• E1 and other partners to support peak management,

2030 Projects	Accountability	NS Power Key Action Items	NS Government Key Action Items	Partner Key Action Items
		• Participate in broader sector study on Hybrid Peak opportunity. • Collaborate in development of load management initiatives.	policies and program tools.	demand response, and efficiency programming. • Net Zero Atlantic to complete Hybrid Peak study.
Reliability Tie	NS Power	• Procure and finance through utility regulated model, including competitive procurements for required products and services. • Continued engagement with NB Power on Stage 2 to Point Lepreau.	• Ensure coordinated review and issuance of required authorizations. • Advocate for federal support and funding. • Continued engagement with NB Government on extension to Point Lepreau.	• NB Power to complete work to enable transmission connection to Salisbury, NB.
Fast-Acting Generation	NS Government	• Per direction from Natural Resources and	• Ensure coordinated review and	• NSIESO to procure required Fast-

2030 Projects	Accountability	NS Power Key Action Items	NS Government Key Action Items	Partner Key Action Items
		Renewables, NS Power is no longer responsible for the project and is to transfer all relevant project-related work developed to-date to NSIESO. • Complete interconnection studies and assets.	issuance of required authorizations. • Development of project procurement process and transfer of procurement responsibilities to NSIESO.	Acting Generation resources in alignment with required timelines.
Fuel Conversions	NS Power	• Procure and finance through utility regulated model including competitive procurements for required products and services		

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8.2 Implementation Coordination

The Province of Nova Scotia and NS Power are both committed to meeting 2030 coal phase-out and 80 Percent Renewable Energy Standard targets. NS Power will continue to participate in a Working Group for 2030 Clean Energy Targets with the Province to support cost-effective, timely, and successful program implementation. The Working Group will ensure close coordination between provincial staff and NS Power staff to support cost-effective, timely, and successful program implementation. The Working Group will also identify enabling conditions for the plan projects.

8.3 Risk Management

Delivering on The Path to 2030 will require significant capital investments and new programs over the next six years. Risk management will be integral to implementation and reaching the 2030 environmental policy goals. Individual projects/elements of the plan will be implemented with detailed risk identification and mitigation strategies.

Last year's The Path to 2030 report identified six industry wide risks to be monitored and addressed as we progress towards 2030. These risks are summarized below, and details have been added to identify how these risks are trending relative to when they were reported in the 2023 report.

1. Supply Chain
   - 2024 Trend: No change
   - There continues to be constraints in the global electricity industry supply chain due to factors such as high demand/capital build-out for both electricity supply and load facilities across the industry, extreme weather and other one-time events, general inflation, and geopolitical events. This is leading to longer lead times, price increases and volatility, and lack of equipment availability.
2. Inflationary Cost Pressures
   - 2024 Trend: Reduced risk

- Inflation has been easing in North America over the last 12 months, with future cuts to the Bank of Canada and the US Federal Reserve overnight interest rates expected. Although inflation indices have been declining, future inflation can lead to project cost risk and cost uncertainty as suppliers refrain from providing long-term price commitments or require indexed price commitments.

3. Human Resources
   - 2024 Trend: No change
   - The electricity industry continues to face a shortage of talent due to high demand in both the electricity industry and adjacent industries, such as housing and other construction. This is leading to cost pressures, staffing challenges, and ultimately project delays. Talent shortages have the potential to affect NS Power, its partners across the province, and its contractors and suppliers.
4. Project Approvals
   - 2024 Trend: No Change
   - The 2030 Clean Power Plan requires the approval of large, capital-intensive projects such as IPP wind deployment and NS Power transmission builds. These projects will need clear First Nations, Community, and Stakeholder support to receive environmental approvals. IPP projects will require interconnection facility approvals and inclusion in fuel cost recovery. NS Power projects will require regulatory approval for cost recovery within electricity rates.
5. Transition Planning
   - 2024 Trend: Increasing Risk
   - The electricity load in Nova Scotia is expected to continue to grow and the comparative cost of potential supply resources will continue to shift over time. In the 2024 Load Forecast report the forecast firm peak for 2025 increased by 108 MW compared to the forecast in the 2023 Load Forecast report. This increase in forecast firm peak delays the retirement of any coal generation until replacement capacity is added to the system and pulls forward the expected timeline for generation capacity additions post 2030.

6. Evolving Policy Landscape

- 2024 Trend: Reduced Risk
- As the development of the Clean Electricity Regulations progressed in 2024, clarity on what the final regulation will look like improved, and on September 16, 2024, the Federal Government announced that a common understanding was achieved with the Government of Nova Scotia on the CER: the future CER will provide flexibilities to enable system growth and support decarbonization in the Province while ensuring reliability for customers. Other areas where policy changes could impact system planning through 2030 (and beyond) include North American Electric Reliability Corporation (NERC) and Northeast Power Coordinating Council (NPCC) criteria and requirements as well as provincial and federal policies related to electrification (which influences load forecasts). NS Power will continue to be responsive to changes in the policy landscape via its IRP Roadmap.

9.0 CONCLUSION

The Nova Scotia 2030 Clean Power Plan is a comprehensive clean energy transition plan that is aligned with NS Power's most recent IRP Action and Roadmap update. Delivering on this plan will require significant investments, program activities, engagement, and coordination across multiple parties including NS Power, the Provincial Government, renewable procurement administrators, third party IPPs, Mi'kmaw Partners, community groups, E1, and the NSIESO over the next five years to achieve the plan.

Pursuant to NS Power's accountabilities under the matrix provided in **Figure 9**, the Company understands its obligations in delivering the associated capital investments, customer programs, and in assisting other parties in satisfying their respective obligations where applicable. NS Power will continue to participate in a Working Group for 2030 Clean Energy Targets with the Province to support successful program implementation. The Working Group will also identify enabling conditions for the plan projects.

NS Power and the Province are in alignment on what must be done to reach 2030 Decarbonization Goals, and that the Province's 2030 Clean Power Plan provides clarity on those requirements and responsibilities. The addition of the NSIESO and NS Energy Board will introduce new stakeholders to assist with reaching Nova Scotia's decarbonization goals. NS Power is committed to supporting the transition of accountabilities to the NSIESO in collaboration with NRR.