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Request IR-1:

Please provide the assessment reports, inspection records, and other supporting documentation that identified the original project scope and additional repair scope for Trenton Unit 5.

Response IR-1:

The original outage scope was not developed from a discrete engineering assessment report, therefore no assessment or inspection reports can be provided. Rather, the scope was established through outage planning conducted jointly with Siemens, based on operating hours, maintenance interval expectations, unit condition monitoring data, and prior turbine experience.

The original scope was based on:

- Unit operating hours and cycles (55,000 hours since the 2012 maintenance outage, exceeding the typical 50,000-hour maintenance strategy interval)
- Anticipated wear and damage informed by Siemens' and NS Power's past turbine experience
- Known conditions and unit monitoring data

The additional refurbishment scope was identified after disassembly during the outage in 2025. Specific defects discovered during disassembly included:

- IP spindle damage requiring grit blasting and refurbishment
- Impulse row shroud band retaining rivet deterioration
- Babbitt material defect on #1 bearing requiring recasting/machining

These defects should not be considered abnormal for a turbine of this age and operating profile. However, the specific defects, their severity, and the associated refurbishment requirements could

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- 1 not be determined until the unit was disassembled and inspected during the outage. Inspection
- 2 results are provided in Confidential Attachments 1 – 3.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

**CI C0068659 NSEB IR-1 Confidential Attachment 1 has
been removed due to confidentiality.**

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**CI C0068659 NSEB IR-1 Confidential Attachment 2 has
been removed due to confidentiality.**

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**CI C0068659 NSEB IR-1 Confidential Attachment 3 has
been removed due to confidentiality.**

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Request IR-2:

In Appendix F, page 36, of NS Power’s ACE 2026 application, NS Power stated that Trenton 5 is forecasted to retire in 2027.

However, in this application file, NS Power noted the following:

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.

(a) Please provide the most current retirement plan for Trenton Unit 5, including the planned retirement year, and any system planning changes that may affect the retirement date.

(b) Was the additional work identified in the ATO needed to keep the plant going until 2027?

(c) Please provide a list of all capital investments planned for Trenton Unit 5 prior to its retirement, including the purpose, estimated costs, and the expected year of each investment; and

(d) Please explain whether the proposed refurbishment project aligns with NS Power’s plan to meet the 80% renewable target by 2030.

Response IR-2:

(a) The current retirement plan for Trenton Unit 5 is reflected in the 2026 10-Year System Outlook (10YSO) Report filed with the Board by the Independent Energy System Operator of Nova Scotia (IESO Nova Scotia) on June 26, 2026. Based on the current expected in-

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1 service dates for fast-acting generation, the 10YSO reports that Trenton 5 is currently
2 expected to be required through Winter 2029/2030 to maintain adequate Planning Reserve
3 Margin. The retirement date remains dependent on the timing and successful
4 commissioning of replacement fast-acting generation and may change as system planning
5 assumptions evolve.

6
7 (b) Yes.

8
9 (c) Based on current planning assumptions, NS Power does not anticipate any major life-
10 extension capital projects for Trenton Unit 5 prior to retirement. Planned investments will
11 be focused primarily on sustaining capital required to maintain the unit's safe and reliable
12 operation through its remaining service life. These activities include routine boiler
13 inspection and refurbishment programs, turbine valve and control system maintenance,
14 mill and fuel-handling equipment refurbishment, environmental compliance work,
15 instrumentation and control system upgrades, and steam piping refurbishments identified
16 through ongoing inspections, and operational monitoring. 2027 capital requirements,
17 including project scope, purpose, estimated costs, and timing, are currently being finalized
18 through NS Power's asset planning and capital budgeting processes. The resulting plans for
19 2027 and beyond will be filed with the Board as part of NS Power's Annual Capital
20 Expenditure (ACE) filings going forward.

21
22 (d) Yes, the proposed refurbishment project aligns with legislative requirements to meet the
23 80% renewable target by 2030. Trenton Unit 5 currently provides firm generating capacity
24 needed to maintain system reliability while renewable generation and replacement fast-
25 acting resources are developed and placed into service.

26
27 The refurbishment supports the safe and reliable operation of the unit during this transition
28 period and is intended to maintain reliability until replacement capacity is available, not to
29 extend coal generation beyond NS Power's decarbonization objectives.

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Request IR-3:

In its response to NSUARB’s IR-88 of 2025 ACE Plan, NS Power stated that some critical components could be utilized as future spares on Tufts Cove Unit 3 and Point Tupper Unit 2.

(a) Please provide a table identifying all components refurbished as part of the proposed IP-LP refurbishment project. For each component, please indicate whether NS Power expects the component to be retained or reused as a spare part for any other generating unit after the retirement of Trenton Unit 5. Please also identify the potential receiving generating unit or facility and indicate whether each potential receiving unit or facility is currently expected to retire before 2030; and

(b) If any component is not expected to be reused as a spare, please explain why not.

Response IR-3:

(a-b) The IP-LP refurbishment project was undertaken to restore Trenton Unit 5 equipment to a condition suitable for continued safe and reliable operation. Following the eventual retirement of Trenton Unit 5, NS Power will assess the condition, compatibility, and future fleet requirements for any major turbine components removed from service. Consistent with NS Power's response to the Board’s IR-88 in the 2025 ACE Plan, certain components may have value as strategic spare parts for other generating units; however, a final determination cannot be made until retirement planning is completed and component condition is assessed.

Please refer to the table below.

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Component Refurbished	Refurbished Work	Expected to be Retained as Spare?	Potential Receiving Unit/Plant	Expected to Retire before 2030?
IP Spindle and Blades	Removal and grit blasting of the IP spindle to facilitate refurbishment of damaged sections identified during disassembly	Yes — refurbished IP spindle could be retained as a spare for other similarly configured NS Power turbines	Tufts Cove Unit 3, Point Tupper	No — neither Tufts Cove Unit 3 nor Point Tupper is currently expected to retire before 2030
Impulse Row Shroud Band Retaining Rivets	Refurbishment of shroud band retaining rivets to address deterioration that risked shroud band liberation during operation	Yes, the refurbished retaining rivets could be used as a spare with the IP spindle assembly	Tufts Cove Unit 3, Point Tupper	No — neither Tufts Cove Unit 3 nor Point Tupper is currently expected to retire before 2030
#1 Bearing Babbitt Material	Complete recasting/machining of the babbitt material on the #1 bearing to eliminate an unanticipated	Yes, the #1 bearing could be used as a spare for other similarly	Tufts Cove Unit 3, Point Tupper	No — neither Tufts Cove Unit 3 nor Point Tupper is currently

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Component Refurbished	Refurbished Work	Expected to be Retained as Spare?	Potential Receiving Unit/Plant	Expected to Retire before 2030?
	defect that rendered the bearing unfit for service	configured NS Power turbines		expected to retire before 2030

1

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Request IR-4:

(a) What is the current rated capacity in MW of Trenton Unit 5?

(b) Please compare Trenton Unit 5's annual energy production data to NS Power's total annual generation for each year since the last maintenance outage in 2012.

(c) Is Trenton Unit 5 classified as a lower-emitting or higher-emitting generating unit relative to NS Power's other similar thermal generating units?

(d) Is Trenton Unit 5 classified as a lower-cost or higher-cost generating unit relative to NS Power's similar thermal units?

Response IR-4:

(a) The current rated capacity of Trenton Unit 5 is 150 MW.

(b) The table below compares Trenton Unit 5 annual energy production relative to NS Power's total annual generation.

Year	Trenton 5 Gross Production (MWh)	NS Power Total Output (MWh)
2012	299,059	10,111,802
2013	686,912	10,533,338
2014	833,393	10,494,961
2015	833,034	10,061,639
2016	784,271	9,468,528
2017	878,767	9,324,786
2018	574,868	9,604,774

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Year	Trenton 5 Gross Production (MWh)	NS Power Total Output (MWh)
2019	635,984	9,244,178
2020	306,157	8,885,282
2021	289,617	8,643,956
2022	262,213	8,391,689
2023	208,333	7,534,207
2024	307,826	7,800,705
2025	421,891	7,912,836

(c) Trenton Unit 5's emissions profile is mixed. The unit's baghouse system provides superior particulate matter control and enhanced mercury capture relative to thermal generating units equipped with electrostatic precipitators. However, greenhouse gas emissions and combustion-related emissions such as sulphur dioxide and nitrogen oxides remain generally comparable to those of similar coal-fired generating units. Accordingly, Trenton Unit 5 may be considered lower-emitting for particulate matter and mercury emissions, but is not materially lower-emitting overall when compared to other units in NS Power's thermal generation fleet.

(d) Trenton Unit 5 is not considered materially different in cost performance from NS Power's other similarly configured thermal generating units. Its operating cost and capital cost profile is generally comparable to that of other units with similar fuel type, technology, age, and operating characteristics. As such, Trenton Unit 5 would not be specifically classified as either a lower-cost or higher-cost generating unit relative to other comparable units in NS Power's thermal generation fleet.

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Request IR-5:

Beginning in 2020, please provide the annual operating cost of Trenton Unit 5 in \$/MWh and total dollars for each year. Please compare these costs with similar NS Power thermal generating units.

Response IR-5:

NS Power tracks Operating, Maintenance, and General (OM&G) costs at the generating station level; costs are not segregated by each individual unit at Trenton, consistent with common cost centres shared across units at these multi-unit stations. Accordingly, the table below presents station-level OM&G per MWh for Trenton (encompassing Units 5 and 6) alongside NS Power's other coal-fired thermal stations, Lingan (4 units) and Point Tupper (1 unit), for comparison purposes.

Description	Units	2020	2021	2022	2023	2024	2025
Plant Net Generation							
Lingan	MWh	2,496,863	2,663,506	2,180,119	1,532,900	1,559,503	2,195,760
Trenton	MWh	1,225,265	1,129,704	979,546	872,454	858,244	1,127,222
Pt. Tupper	MWh	557,713	767,565	625,187	480,727	563,036	690,323
Operating Cost							
Lingan	CAD	\$15,200,000	\$15,898,010	\$17,147,100	\$18,360,829	\$18,480,323	\$19,800,000
Trenton	CAD	\$11,400,000	\$11,295,044	\$12,355,709	\$12,710,165	\$13,508,870	\$14,700,000
Pt. Tupper	CAD	\$6,800,000	\$7,517,961	\$7,762,586	\$7,856,048	\$8,443,812	\$9,500,000
Cost per MWh							
Lingan	CAD/MWh	\$6.09	\$5.97	\$7.87	\$11.98	\$11.85	\$9.02
Trenton	CAD/MWh	\$9.30	\$10.00	\$12.61	\$14.57	\$15.74	\$13.04
Pt. Tupper	CAD/MWh	\$12.19	\$9.79	\$12.42	\$16.34	\$15.00	\$13.76

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Request IR-6:

In “Why do this project now?”, NS Power noted that:

Unit 5 at Trenton has reached an inspection interval since the last maintenance outage in 2012.

...

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.

(a) Please explain the specific actions, maintenance activities, or repairs, inspections NS Power has undertaken since the 2012 refurbishment to extend the operation of Trenton Unit 5. Please identify each action’s purpose and its estimated cost.

(b) If this project was not implemented, please describe the impact on the utility’s firm capacity, resource adequacy, reliability requirements, etc.

(c) Please describe the current and expected operating role of Trenton Unit 5, including whether the unit is used for regular generation, reserve capacity, peak customer load support, or other system support services.

(i) If Trenton Unit 5 is used for reserve capacity or peak customer load support, please provide a table summarizing each occasion since 2020 on which the unit was dispatched or recalled to service by the NS Power System Operator. For each occasion, please provide the date, duration of operation, maximum output in MW, total energy generated in MWh, and reason for dispatch.

(ii) If it is used as a regular generation facility, please provide annual power generation in MWh and average output in MW.

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1 **(d) Please provide a table showing NS Power’s forecasted annual generation from**
2 **Trenton Unit 5 for each year from 2026 through the unit’s planned retirement year.**

3
4 Response IR-6:

5
6 (a) Since the 2012 refurbishment, and consistent with its asset management framework, NS
7 Power has extended the operation of Trenton Unit 5 through unit condition monitoring,
8 routine preventive maintenance (PM) activities and equipment surveillance, and periodic
9 assessments of turbine performance and condition. These activities were undertaken to
10 maintain the unit's safe and reliable operation and to manage asset risk over its remaining
11 service life.

12
13 The costs associated with routine monitoring, preventive maintenance, inspections, and
14 surveillance activities are generally incurred through operating and maintenance budgets
15 and are not tracked in the same way as discrete life-extension projects.

16
17 (b) If the IP-LP Turbine Refurbishment project was not executed, Trenton Unit 5 would have
18 faced significant operational and reliability risks, impacting NS Power's firm capacity and
19 resource adequacy.

20
21 Immediate reliability risks, as noted in the ATO application, include the potential for
22 cracking in IP-LP components. Defects identified during disassembly and inspection
23 further indicated potential safety and reliability concerns, including shroud band retaining
24 rivet deterioration, and IP spindle damage.

25
26 The impact on available firm capacity would be the total 150 MW that Trenton 5 currently
27 provides. Without the refurbishment, NS Power would have been at an elevated risk
28 exposure for a loss of 150 MW that could require emergency procurement of replacement
29 capacity or demand-side measures.

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(c) The unit's capacity factor will decrease over time as renewable resource additions displace coal-fired generation, consistent with NS Power's decarbonization pathway. However, the unit remains essential for maintaining system reliability during the renewable transition through 2029/2030.

(i-ii) Since 2020, Trenton 5 has been, and is still considered to be, a regular generation facility. The table below summarizes Trenton 5 gross power generation over the period.

Year	Gross Output (MWh)	Average Power Rate (MW)
2020	306,157	118
2021	289,617	118
2022	262,213	86
2023	208,333	75
2024	307,826	103
2025	421,891	108

(d) Please refer to the Independent Energy System Operator of Nova Scotia's (IESO Nova Scotia) 2026 10-Year System Outlook Report filed with the Board on June 26, 2026. Trenton 5 will be required to operate through the winter of 2029/2030 to maintain adequate planning reserve margin. Trenton 5 can only be retired once new fast acting generation is in service and reliable operation has been established.

Prior to the IESO Nova Scotia's 2026 10 Year System Outlook, Trenton 5 was forecast to be retired in 2027/2028, therefore there are no forecasts available to 2030. NS Power's forecasts for Trenton 5 generation until 2028 are provided below; NS Power assumes a similar generation profile beyond this period until replacement generation becomes available.

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NS Power expects generation forecasts for Trenton 5 beyond 2028 will become available through the 2026 IRP process currently being undertaken by IESO-NS.

Year	2026	2027	2028
Forecast (GWh)	348.4	293	230.8

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Request IR-7:

In “Why do this project now?”, NS Power provided a Trenton 5 – Asset Risk Profile chart.

(a) Please provide additional details on the asset risk profile chart, including the risk analysis methodology, and how the chart should be interpreted for purposes of identifying refurbishment, replacement, or other capital work requirements; and

(b) Please describe the current operational condition of each item shown in the asset risk profile chart and identify whether any items other than the IP-LP component are expected to require capital works, such as refurbishment or repair.

(i) If additional items in the chart require refurbishment, replacement, or other capital work, please identify the components, the expected timing of the work, and estimated costs. Please explain whether NS Power expects to submit an approval request to the Board.

(ii) If no additional work is required for other items in the chart, please explain why not.

Response IR-7:

(a) The Asset Risk Profile chart is consistent with NS Power's corporate Asset Management (AM) Mechanism, and is intended to provide a visual representation of asset risk across the Trenton 5 Turbine and to support capital planning and asset management decision-making. The chart combines two key risk factors:

- Probability of Failure (Condition) – The likelihood that an asset will experience a failure or significant performance degradation.**

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- 1 • Consequence of Failure (Criticality) – The operational, safety, environmental,
2 regulatory, and financial impacts should a failure occur.

3
4 The risk assessment methodology for the Trenton 5 IP-LP Turbine Refurbishment project
5 used a combination of quantitative and qualitative inputs to determine the overall risk
6 profile of each asset, including operational history, running hours, equipment performance
7 trends, internal and external expertise, and the impact of an asset failure or degradation for
8 the Trenton 5 Turbine. Details of the criteria used for assigning criticality and condition
9 are outlined in NS Power's Capital Expenditure Justification Criteria (CEJC).

10
11 The chart should be interpreted as a prioritization tool for identifying refurbishment,
12 replacement and other capital investment requirements. When comparing assets across the
13 portfolio, a higher risk rating does not necessarily indicate imminent failure or capital
14 investment. Instead, it highlights assets where the combination of condition and criticality
15 results in a greater potential impact to the organization. As a result, assets with the highest
16 risk scores are typically prioritized for risk mitigation, which may include capital funding,
17 to reduce overall business risk and improve long-term reliability.

- 18
19 (b) The condition for most turbine components is estimated based on accumulated operating
20 hours and cycles, informed by original equipment manufacturer (Siemens) design life
21 assumptions and NS Power's operating history and experience with similar turbines across
22 its fleet. The actual physical condition of these components cannot be definitively verified
23 while the unit remains in service. These components are only accessible for direct visual
24 and non-destructive examination once the equipment is opened and a partial or full
25 disassembly is performed during a planned outage. The current operational risk of the
26 Trenton 5 Turbine is summarized below:

- 27
28 • Turbine Valves

29 • Main Turbine Valves: Risk 20, planned refurbishment in 2027

30 • Reheat Turbine Valves: Risk 15, planned refurbishment in 2028

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- Turbine Bearings: Risk 10, no planned refurbishment in near term, risk mitigation in 2025 via inspection and refurbishment
 - IP-LP Turbine: Risk 10, potential refurbishment in 2030*, risk mitigation in 2025 via inspection and refurbishment
 - HP Turbine: Risk 15, potential refurbishment in 2030*
 - DFLP Turbine: Risk 10, no planned refurbishment in near term, risk mitigation in 2025 via inspection and refurbishment
- *Note: The potential 2030 refurbishments for the IP-LP Turbine and HP Turbine are contingent on Trenton Unit 5's retirement timeline.*

Cost estimates for future potential refurbishments are still being developed at this time. NS Power will submit each project to the Board in due course, as required and contemplated under the *Public Utilities Act*.

Other items shown in the risk profile chart (e.g., the HP turbine section) were not flagged for capital work at this time because their operating hours did not meet the threshold requiring inspection or intervention in this outage; NS Power will continue to monitor these components and will bring forward a capital request if and when their risk warrants refurbishment.

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Request IR-8:

In “Reason for Variance”, NS Power described a few defects discovered during its inspection work.

(a) Please summarize the identified defects in a table. For each defective component or work item, please describe in plain language, the component’s function and purpose within Trenton Unit 5. Please provide tables, drawings, diagrams, photos, or other supporting materials to support the explanation; and

(b) Please describe the expected service life of each repaired or replaced component.

Response IR-8:

(a-b) The following table summarizes the defects identified during the Trenton Unit 5 IP-LP Turbine Refurbishment, as included in the ATO application. Please also refer to IR-1 Attachments 1-3.

Component	Defect Identified	Function and Purpose	Expected Life
IP Spindle and Cylinder Blade Damage	Damage requiring grit blasting and refurbishment of damaged sections	The IP spindle is the rotating shaft that supports the IP turbine blades which transmits rotational energy from the steam to the generator. It operates under high temperature and pressure and is subject to erosion and creep damage over time.	5 years

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Component	Defect Identified	Function and Purpose	Expected Life
Impulse Row Shroud Band Retaining Rivets	Deterioration of rivets holding shroud bands in position; risk of shroud band liberation during operation	Shroud bands encircle the tips of turbine blades to reduce steam leakage, improve efficiency and provide structural support to blade segments. The retaining rivets secure these bands. Failure of the rivets could result in shroud band liberation, leading to catastrophic turbine damage and safety risks.	5 years
#1 Bearing Babbitt Material	Unanticipated defect rendering the bearing unfit to return to service	The #1 bearing supports the turbine rotor and maintains proper shaft alignment. The babbitt material is a soft bearing lining that provides low-friction support. Defects in the babbitt can lead to bearing failure, shaft misalignment, and severe vibration leading to significant shaft damage.	10 years

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Request IR-9:

On page 4 of the application, NS Power provided a Cost Variance Sheet showing a variance of \$1,499,051 in the “Contracts” line item.

(a) Please provide detailed breakdowns for all unplanned works included in the Contracts variance, including invoice work orders, or service records, where available.

Response IR-9:

(a) The Contracts variance of \$1,499,051 represents incremental contract costs associated with unplanned turbine refurbishment work identified during disassembly and inspection activities. As is common with major turbine refurbishments, the full scope of component condition could not be confirmed until the unit was opened and detailed inspections were completed.

The unplanned work included a combination of:

- Additional turbine inspection and technical support services.
- Specialized turbine repair and refurbishment activities required to address previously unidentified component degradation.
- Rotor, blade, diaphragm, and associated turbine component inspection and restoration work.
- Machining, balancing, non-destructive examination (NDE), and quality assurance services.
- Field mechanical labour and specialty contractor support for disassembly, repair, reassembly, and alignment activities.
- Additional scaffolding, rigging, lifting, and equipment rental services required to execute the expanded scope.

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- Supplementary piping, instrumentation, and electrical support services associated with the refurbishment work.
- Waste handling, cleaning, material processing, logistics, and transportation services required to support the unplanned repairs.

Contract expenditures were incurred across a number of specialized service providers, equipment manufacturers, and industrial support contractors. The largest portion of the variance was associated with turbine OEM, Siemens, and specialized turbine refurbishment services, with the remainder attributable to field mechanical support, machining and inspection services, industrial services, equipment rental, logistics, and ancillary project support activities.

The variance reflects the actual costs required to complete the unplanned refurbishment work and return the unit to safe and reliable operation following the discovery of additional component degradation during.

Further detailed cost breakdown per unplanned is summarized below:

- Turbine Blade Repairs (\$450k)
 - ~\$15k inspection testing
 - ~\$10k material and consumable material
 - ~\$425k contract millwright labour
- Shroud Band Rivet Repairs (\$450k)
 - ~\$15k material and consumable material
 - ~\$15k for technical consultation and scope development/finalization
 - ~\$420k contract millwright repair
- Babbit and Bearing Repairs (\$175k)
 - ~\$125k material and consumable material
 - ~\$50k contract millwright labour