

CI C0059483

83V L-5017 and L-5046 Rebuild Tap

NON-CONFIDENTIAL

February 26, 2026



NSEB APPROVAL SHEET

Project Title: 83V L-5017 and L-5046 Rebuild Tap

CI Number: C0059483

Date: February 26, 2026

Expenditure Profile			Type of Filing	
Year	Budget Amount	Project Estimate	☒	Capital Project Authorization
2024		85,588	☐	Unforeseen and Unbudgeted (U&U)
2025	280,192	163,959	☐	Planned & Advanced (P&A)
2026	927,126	1,308,569	☒	Subsequent Approval Item
			☐	Authorization to Overspend (ATO)
			☐	Scope Change
			☐	Final Cost (FIN)
Total	\$1,207,318	\$1,558,116		

COMMENTS

Submitted on behalf of NOVA SCOTIA POWER INCORPORATED



Approved on behalf of NOVA SCOTIA ENERGY BOARD

Authorized Signatory
Dave Pickles
Chief Operating Officer

DATE
February 26, 2026

DATE

CI Number: C0059483**Title: 83V L-5017 and L-5046 Rebuild Tap**

Start Date: 2024/01
In-Service Date: 2026/07
Final Cost Date: 2027/01
Function: Transmission
Forecast Amount: \$1,558,116

DESCRIPTION:

This project is to rebuild the L-5046 tap at its intersection with L-5017, which is in the Wolfville, Annapolis Valley area. The tap structures and switches at this location were identified as requiring replacement as part of NS Power's inspection program. The replacement work included in this project consists of the removal and replacement of 9 transmission structures, as well as the installation of 1 new transmission switch (83V-504). To facilitate the construction, an outage is required to install the new tap location structures, the installation of inline switches is also required to create a transmission line isolation envelope during construction.

This project will be constructed in two phases. The first phase will consist of the installation of three in-line switches at the tap location, after which the first five transmission structures will be replaced. The second phase will include the removal of an existing switch and installation of one new switch(83V-504), which will also require the replacement of 4 additional transmission structures. This upgraded transmission line design, as well as the upgraded switch assets will allow on-load switching. The updated tap design will also allow for efficient isolation by the creation of a permanent bypass connecting the two transmission lines. This adds overall operational flexibility to the transmission system in this region.

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 2024, 2025, 2026, 2027 or 2028

Depreciation Class: Transmission Plant – Overhead Conductors and Devices

Transmission Plant – Poles and Fixtures

Transmission Plant – Station Equipment

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: 0.03%

JUSTIFICATION:

Justification Criteria: Transmission Plant

Why do this project?

The equipment at the L-5046 and L-5017 tap, as well as the 83V-504 switch are degraded. The assessed condition of these assets, as determined through NS Power's transmission line inspection program, was found to be deteriorated to the point where replacement is required (please refer to Attachment 1). Failure of these assets would result in an unplanned power outage to over 5,500 customers in the area. Upgrading this switch will also allow live line operation, permitting NS Power to operate the switch without a line outage to facilitate future construction and maintenance work as appropriate. This upgrade will prevent customer outages due to switching activities otherwise necessary to undertake such work.

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 reliable operation of the transmission line. The structures and switch at the tap require replacement, due to their deteriorated condition. Unplanned asset failures on this line, serving approximately 5,500 customers, would result in unplanned outages for these customers.

The proposed design changes will increase reliability to the system in the area, seek to eliminate unnecessary customers outages for switching, and remove any vehicular access issues. These key factors highlight the requirement and urgency for this project to be completed at this time.

Why do this project this way?

The existing location of the switches has posed serious safety issues when accessing the location during winter conditions, impeding access that is required for operation and maintenance of the existing switches. The new switch location and transmission line design will eliminate these access issues, as well as allow the incorporation of live line (on load) switching, allowing NS Power to operate the switch under live line conditions. This will eliminate the existing requirement to take an outage for customers along the line for the duration of the switching operation. The proposed new location of the 83V-504 switch will be roadside, which makes all maintenance and corrective activities more efficient, including quicker restoration times for customers should an unplanned event occur.

Replacement of the switch in the same location was investigated as an option during the project's preliminary planning stage, including a site visit to assess this direction. However, due mainly to the site location access issues, this option was not considered feasible and therefore was not assessed further. As a result, the project team shifted the switch installation to a roadside location.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expert (Professional Engineers) judgement, and the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 3 estimate with a contingency of 15 percent. Risks intended to be covered by this contingency include contractor availability during the warmer construction months and pricing uncertainties for material costs associated with grounding material. The new switch requires a grounding grid, which can only be completed after the switch design has been finalized. During grounding grid construction, excavation is required and additional rock breaking to install the grid may be required. In addition, the contingency will cover delays in the delivery of long lead material items, as well as unknown items that may be discovered during the detailed engineering design process, such as road lane closures, traffic control and the installation of traffic barriers or bollards to provide protection to the switch structure from any vehicular impact.

Reason for Variance

The increase of \$350,789 from the 2026 ACE Plan subsequent submittal estimate of \$1,207,318 is due to additional grounding requirements for the installation of the new 83V-504 switch. Due to its proposed location, adequate grounding overhead wire, as well as the replacement of 5 transmission structures is required, resulting in additional material and construction related costs.

Capital Project Detailed Estimate

Location: Steam

C# : C0059483

Title: 83V L-5017 and L-5046 Rebuild Tap

Execution Year: 2026

Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#s)
Regular Labour						
T&D Labour - Engineering	PD	200	\$ 62	12,414		
T&D Labour - Project Management	PD	397	\$ 62	24,621		
T&D Labour - Design	PD	20	\$ 450	9,000		
T&D Labour - PLT Switching	PD	125	\$ 403	50,375		
T&D Labour - Site Supervision	PD	500	\$ 50	25,000		
T&D Labour - Closing	PD	15	\$ 450	6,750		
Substation & Commissioning	PD	10	\$ 321	3,213		
			Sub-Total	131,373		
Travel Expense						
Travel Expense	Lot	1	\$ 4,500	4,500		
			Sub-Total	4,500		
Materials						
Transmission Construction Material	Lot	1	\$ 190,799	190,799		
Substation Construction Material	Lot	1	\$ 54,807	54,807		
			Sub-Total	245,606		
Contracts						
Transmission Construction	Lot	1	\$ 425,926	425,926		
Substation Construction	Lot	1	\$ 104,965	104,965		
Vegetation Clearing	Lot	1	\$ 40,000	40,000		
Road Access Upgrade	Lot	1	\$ 30,000	30,000		
Traffic Control (Flagging)	Lot	1	\$ 15,000	15,000		
Environmental and Permits	Lot	1	\$ 6,000	6,000		
Miscellaneous Costs	Lot	1	\$ 10,000	10,000		
			Sub-Total	631,891		
Consulting						
Transmission Line Survey	Lot	1	\$ 5,700	5,700		
Transmission Line Design (Tap)	Lot	1	\$ 40,698	40,698		
Switch installation and grounding design	Lot	1	\$ 52,605	52,605		
T-line design - modification for switch	Lot	1	\$ 43,793	43,793		
Topographic survey for new switch	Lot	1	\$ 6,830	6,830		
			Sub-Total	149,626		
Other Goods & Services						
Contingency	%	15%	\$ 1,162,997	174,450		
			Sub-Total	174,450		
Vehicle Overhead						
Vehicle Labour AO				46,973		
			Sub-Total	46,973		
Interest Capitalized						
AFUDC				31,646		
			Sub-Total	31,646		
Administrative Overhead						
Labour AO				71,382		
Contractor AO				70,669		
			Sub-Total	142,051		
SUB-TOTAL (no AO, AFUDC)				1,337,446		
TOTAL (AO, AFUDC included)				1,558,116		
Original Cost				247,768		

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.



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: 83V L-5017 and L-5046 Rebuild Tap		Started or Preliminary		Class 5	Class 4	Class 3
Maturity Level of Project Definition Deliverables		Defined or Complete		Class 2	Class 1	
General Project Data						
A. Scope						
Project Scope of Work Description		Defined (D)	P	P	D	D
Site Infrastructure (Access, Construction Power, Camp, etc.)		Defined (D)	NR	P	D	D
B. Capacity						
Voltage (kV) and Circuits		Defined (D)	P	P	D	D
C. Project Location						
Not Applicable						
D. Requirements						
Codes and/or Standards		Defined (D)	NR	P	D	D
Environmental Monitoring		Not Applicable (NA)	NR	NR		
E. Technology Selection						
Not Applicable						
F. Strategy						
Right-of-Way (ROW)		Defined (D)	P	P	D	D
Contracting/Sourcing		Defined (D)	NR	P	D	D
Escalation		Not Applicable (NA)	NR			
G. Planning						
System/Grid Planning (including substation and interconnect locations)		Defined (D)	P	P	D	D
Logistics Plan		Defined (D)	P	P	P	D
Integrated Project Plan		Defined (D)	NR	P	D	D
Project Code of Accounts		Defined (D)	NR	P	D	D
Project Schedule		Defined (D)	NR	P	D	D
Regulatory Approval & Permitting		Not Applicable (NA)	NR			
Risk Register		Preliminary (P)	NR	P		
Stakeholder Consultation/Engagement/Management Plan		Defined (D)	NR	P	D	D
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
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		Preliminary (P)	NR	P		
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		Not Applicable (NA)				
Route Mapping/Survey		Complete (C)	S/P	P/C	C	C
Design Specifications		Preliminary (P)	NR	S/P		
Instrument List		Not Applicable (NA)	NR			
Construction Permits		Not Applicable (NA)	NR			
Geometric Layout, Alignment, Profile, Cross Section		Complete (C)	NR	S/P	P/C	C
Land/ROW Title Negotiation		Complete (C)	NR	S/P	P/C	C
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		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		Not Applicable (NA)	NR	NR		
Total # Deliverables for this Project						
		8	22	18	17	16
% Defined/Complete towards Class Estimate						
		100%	100%	78%	74%	70%

Comments:

This project is being filed as a Class 3 estimate. The defined deliverables for this project indicate that 78% of Class 3 deliverables are completed. A contingency value of 15% was selected to account for specific risks such as contractor availability, varying material costs, coverage for delays in the delivery of long lead material items, and unknown items that may be discovered during the detailed engineering design process.

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 [s]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 subsea 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 bathymetry³ and metocean² 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.).

Subtype	Structure ID	Inspection Date	Inspection Method	Structure Status	Recommendations	Scheduled	Work Order ID	Field Priority	Comments	created_date	last_edited_date
1	L5017-057	23-Apr-07	Foot	Pass					switch pole 83 V 504 505 506 take - off to 5046 3 guys 3 A	23-Apr-07	27-Jan-19
1	L5017-057	18-Jan-10	Foot	Pass			275386		Air Brake switching pole switch #'s 83V -503 83V -504 83V-505 3 guys 7/16 bear claw	18-Jan-10	27-Jan-19
	L5017-057	26-Oct-17	Helicopter	Pass					2017 annual helicopter inspection		27-Jan-19
	L5017-057	14-Oct-18	Helicopter	Pass							27-Jan-19
1	L5017-057	14-Jan-19	Foot	Pass				NA	10 small woodpecker holes, grout deteriorating vertical strings, two of three hooked guys slack, ok for now	14-Jan-19	27-Jan-19
	L5017-057	31-May-20	Helicopter	Pass						10-Jun-20	10-Jun-20
	L5017-057	9-Apr-23	Foot	Fail	remove 60' switching structure	2026	8781731	16MTHS	Top jumper backside melted multiple broken strands. Other jumpers pitted, melted in a few spots.10 med wphs. Tap and switches.	9-Apr-23	17-Sep-25