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BY EMAIL

March 21, 2024

Ms. Nancy Marconi
Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4
Registrar@oeb.ca

Dear Ms. Marconi:

**Re: Ontario Energy Board (OEB) Staff Submission
Hydro One Networks Inc.
Leave to Construct Application – K4 Reconductoring Project
OEB File Number: EB-2023-0197**

Please find attached OEB staff's submission in the above referenced proceeding, pursuant to Procedural Order No. 1.

Yours truly,

Original Signed By

Abla Nur
Analyst, Generation and Transmission

Encl.

cc: All parties in EB-2023-0197



ONTARIO ENERGY BOARD

OEB Staff Submission

Hydro One Networks Inc.

Leave to Construct Application – K4 Reconductoring Project

EB-2023-0197

March 21, 2024

1. Background and Overview

1.1 Overview of Application

On November 13, 2023, Hydro One Networks Inc. (Hydro One) applied to the Ontario Energy Board (OEB) for an order under sections 92 and 97 of the *Ontario Energy Board Act, 1998* (Act) for approval to refurbish approximately 10 kilometres (km) of the existing “circuit K4” 115 kV single-circuit transmission line between Kirkland Lake Transformer Station (TS) and Structure (Str) 82 towards Matachewan Junction (JCT) in Kirkland Lake, Ontario (Project).

Hydro One also applied for approval of the forms of the agreement offered or to be offered to affected landowners for the establishment of additional permanent rights, as well as temporary construction rights for access or staging areas required for the duration of the construction period.

Circuit K4 is a 115 kV single-circuit transmission line that provides a radial connection between Kirkland Lake Transformer Station and several Customer Transformer Stations (CTS). Originally constructed in 1924, circuit K4 is primarily a wood pole transmission line that spans 97 km and predominantly services mining operations in the area of Kirkland Lake. Hydro One owns and manages 64 km of the circuit, with the remaining portion being customer-owned. The 10 km section of the Hydro One-owned and operated line proposed for refurbishment is of original vintage. The remaining sections of the Hydro One-owned and operated circuit K4 were refurbished in 2011.

The proposed Project includes the replacement of existing wood pole structures and the installation of a new 977 kcmil aluminum-conductor steel-reinforced cable (ACSR) conductor. Additionally, twelve wood pole structures not in end-of-life condition will be replaced to accommodate the new conductor. A 5 km section of the Project requires a new wood pole line to be constructed parallel to the existing line, resulting in a change of the circuit center-line by approximately 15 metres. This section will also involve the installation of a new 977 kcmil ACSR conductor, as well as a new steel lattice structure.

1.2 OEB’s Jurisdiction in Section 92 Applications

The criteria for the OEB’s consideration of a leave to construct application is found in section 96 of the Act, which states:

96 (1) If, after considering an application under section 90, 91 or 92 the Board is of the opinion that the construction, expansion or reinforcement of the proposed work is in the public interest, it shall make an order granting leave to carry out the work.

(2) In an application under section 92, the Board shall only consider the following when, under subsection (1), it considers whether the construction, expansion or reinforcement of the electricity transmission line or electricity distribution line, or the making of the interconnection, is in the public interest:

1. The interests of consumers with respect to prices and the reliability and quality of electricity service.

Section 97 of the Act states that leave shall not be granted under section 92 until the applicant satisfies the OEB that it has offered or will offer to each owner of land affected by the approved route or location an agreement in a form approved by the OEB.

1.3 Overview of OEB Staff Submission

OEB staff supports Hydro One's section 92 request for leave to construct, and submits that any approval granted by the OEB should be subject to the standard conditions of approval set out in Section 2.6 of this submission, below. OEB staff also supports Hydro One's section 97 request for approval of the forms of agreements it will offer affected landowners. OEB staff's submission is provided in further detail below.

2. OEB Staff Submission

2.1 Project Need and Alternatives

The need for Hydro One to conduct sustainment work on circuit K4 is identified in the Independent Electricity System Operator's (IESO's) study titled "North & East of Sudbury Scoping Assessment Outcome Report".¹ The report highlighted numerous facilities in the study area approaching end of life over the next 10 years. The report identified the section of circuit K4 between Kirkland Lake TS and Matachewan JCT as having reached end of life and requiring refurbishment in 2023.² Hydro One states that this section of line was constructed in 1924 and is of original vintage.³

Given that circuit K4 operates as a radial line rather than a network system facility, it has not been considered by the IESO in recent Integrated Regional Resource Plans, Regional Infrastructure Plans, or Bulk System Plans.

Demand in this region is largely driven by resource based industrial customers such as mining operations. While refurbishment of the Project using the existing conductor size would be sufficient to meet customer needs, Hydro One proposes upgrading to the larger 977 kcmil conductor size. This proposal aims to leverage the ongoing line work as an opportunity to reduce transmission line losses.

The proposed construction method was chosen to accommodate the customers served by circuit K4. Customers connected to circuit K4 are typically large industrial customers whose operations are highly sensitive to interruptions and are less able to tolerate prolonged outages.⁴ The proposed method involves the creation of a new 5 km section of the circuit K4. This new wood pole line will be constructed parallel to the existing end-of-life K4 facilities, as opposed to an in-situ refurbishment option.

Hydro One states that this construction methodology is preferred based on the reliability benefits to its industrial customers and considering the limited outage windows available on this portion of the line. Through staff interrogatories, Hydro One confirmed that it had explored an "in-situ" refurbishment option but this would require four or more outages, which could not be tolerated by the connected customers.⁵ The parallel and adjacent construction of this new section will allow customer connection to be maintained during the construction period, with less interruptions than an in-situ alternative. Post energization, the existing end-of-life section will be demolished and removed.

¹ North & East of Sudbury Scoping Assessment Outcome Report, August 13, 2021.

² *Ibid.*, pg.10

³ Application Evidence, Exhibit B-2-1, pg.1.

⁴ Application evidence, Exhibit B-6-1, pg.1

⁵ OEB-Staff IR Responses, Exhibit 1-1- 1. Pg.2

Hydro One considered five incrementally larger conductor options as part of the non-discretionary portion of the Project. The five alternatives are assessed on which provides the most favourable results in terms of total annual cost and Net Present Value (NPV). All alternatives for this project involve replacing the end-of-life assets of the existing circuit K4 section. The analysis of line losses for all five alternatives have been summarized in the table below.

Table 1 – Peak Flow Analysis of Line Losses for Alternatives

	Alt. #1 411 kcmil	Alt. #2 477 kcmil	Alt. #3 732 kcmil	Alt. #4 997 kcmil	Alt. #5 1443.7 kcmil
Capital Cost (\$M)	13.56	13.57	13.74	13.90	14.65
Losses at Peak Flow (MW)	0.31	0.27	0.18	0.13	0.09
Annual Revenue Costs (\$M)	1.03	1.03	1.04	1.05	1.11
Annual Cost of losses (\$M)	0.13	0.11	0.08	0.06	0.04
Total Annual Cost (\$M)	1.16	1.14	1.12	1.11	1.15

Hydro One conducted a 50-year NPV analysis using a 5.65% discount rate and an NPV sensitivity analysis using varying values for the Hourly Ontario Energy Price (HOEP). The results of the NPV analysis have been summarized in the table below.

Table 2 – NPV Analysis of Alternatives

Alternative # / Kcmil	Alt. #1 411	Alt. #2 477	Alt. #3 732	Alt. #4 997.2	Alt. #5 1443.7
Capital cost (\$M)	13.56	13.57	13.74	13.90	14.65
Annual Losses (MWhr)	1,600	1,399	919	680	484
Energy Price \$/MWhr	Alt. #1 411	Alt. #2 477	Alt. #3 732	Alt. #4 997.2	Alt. #5 1443.7
\$47.30	-13.17	-12.95	-12.54	-12.40	-12.81
\$120.00	-15.96	-15.39	-14.14	-13.59	-13.65
\$133.00	-16.46	-15.82	-14.43	-13.80	-13.80

Submission

OEB staff submits that the evidence demonstrates a need for the Project (i.e. the refurbishment of the 10 km section of the circuit K4 that is the subject of this proceeding), to replace end-of-life facilities and to ensure continued reliable supply of electricity.

Furthermore, having assessed the alternatives, OEB staff agrees with Hydro One’s approach to adopt larger conductor sizes relative to minimum standards where it would be cost-effective. All five alternatives outlined in Table 2 above satisfy the need to refurbish the end-of-life facilities. However, considering the ongoing proposed work on the line, and the added benefits of reduced line loss, OEB staff supports Alternative 4 as the preferred option, as it has the lowest annual cost on an NPV basis when the cost of line losses is considered.

2.2 Project Cost

The estimated capital cost of the Project is \$12.9 million, with an additional operating, maintenance and administration expenditure of \$1.0M for removals. The cost estimates are based on a project definition equivalent to a Class 3 (with a range of -20%/+30%) under the American Association of Cost Engineering (AACE) International estimate classification system.

Hydro One presented three comparable projects where single circuit 115 kV wood pole lines were refurbished in Northern Ontario: Circuit A6P Refurbishment, Circuit X2Y Refurbishment, and Circuit H9K Reinforcement Project. The costs of comparable line projects are summarized in Table 3 below.

Table 3 – Costs of Comparable Projects

	Circuit A6P Refurbishment	Circuit X2Y Refurbishment	Circuit H9K Reinforcement	Circuit K4 (proposed Project)
Scope/Type	Refurbish in-situ	Refurbish in-situ	Refurbish in-situ	Partial Refurbish in-situ
Voltage	115 kV	115 kV	115 kV	115 kV
Structure Type	Wood Pole	Wood Pole	Wood Pole	Wood Pole
Single/Double Circuit	Single	Single	Single	Single
Route Length	15.0	7.6	32.0	10.0
Conductor	411 kcmil	411 kcmil	411 kcmil	997 kcmil
In-Service Year	June 2020	June 2020	March 2020	July 2024

Total Cost before adjustment	\$6,034K	\$5,100K	\$11,900K	\$13,900K
Unit Cost/per km	\$455K/km	\$759K/km	\$423K/km	\$854K/km

The total project costs per circuit km for the comparator projects range from \$423K to \$759K. In contrast, Hydro One estimates that the Project will incur a cost of \$854K per circuit km. While OEB-approved inflation factors have been applied to provide a cost comparable price escalation to the circuit K4 refurbishment, Hydro One states that this level of cost increase does not reflect true inflation.⁶ Hydro One attributes this disparity to industry changes driven by global factors such as supply chain issues, interest rate hikes, and inflation, which have significantly impacted the comparability of costs.⁷

Hydro One states that the rationale for the increased costs as compared to previous comparable projects, is that the proposed Project necessitates more complex construction methods not required by the comparator projects. These methods include rock-drilled foundations for structure installation, the rental of off-road vehicles, and other specialized construction equipment, as well as the need for real estate acquisitions to accommodate the new right-of-way (ROW) for a section of the line.⁸

Additionally, Hydro One emphasizes that longer transmission line projects benefit from greater efficiencies due to the ability to spread fixed costs. In contrast, the proposed Project, which requires the refurbishment of a 10 km span, lacks such economies of scale.

Submission

OEB staff submits that Hydro One followed a reasonable process for developing its project cost estimate. Despite the relatively high cost of \$854K per circuit km, OEB staff is satisfied that the circumstances of this project including the need for complex construction methods, real estate acquisitions, the increased costs of materials, and the lack of economies of scale due to the shorter project length, justify the cost differential relative to the comparator projects. OEB staff also notes that the cost per circuit km is approximately 10% higher than the comparator project closest in terms of circuit length, and that this previous project was completed four years ago, prior to the cost pressures experienced in the broader economy taking hold.

⁶ OEB Staff IR Responses, Exhibit 1-1-6, pg.3.

⁷ *Ibid.*

⁸ *Ibid.*

2.3 Customer Impacts

Hydro One states that the costs for the Project will be included in the line connection pool for cost classification purposes and not allocated to any individual customer.⁹ Additionally, as the Project is not being driven by additional load requirements/requests from connected customers, no customer contribution is required.

Hydro One states that the total Project cost is \$13.9 million, with no anticipated incremental operating or maintenance costs in the future. Hydro One further states that there will be an immaterial change in the line pool revenue requirement once the Project's impacts are reflected in the transmission rate base at the projected in-service date of October 2024. Notably, the 2023 OEB approved rate of \$0.88 kW/month remains unchanged over a 25-year time horizon.¹⁰

The Project is also expected to have no impact on the rates of a typical residential customer under the Regulated Price Plan (RPP).

Submission

OEB staff submits that Hydro One's proposed allocation of project costs to the line connection pool is appropriate. OEB staff takes no issue with Hydro One's position that no customer contribution is required.

OEB staff also submits the customer impacts of the Project are appropriate given the need for the Project, its costs and its alternatives.

2.4 Reliability and Quality of Service

The IESO's final System Impact Assessment (SIA) concluded that the Project is expected to have no material adverse impact on the reliability of the integrated power system.

Hydro One's final Customer Impact Assessment (CIA) concluded that the Project will not have any adverse effects on the transmission-connected customers in the area. Hydro One also noted that the Project will increase supply reliability of customers in the Kirkland Lake area.

Submission

OEB staff does not have any concerns about the reliability and quality of service associated with the Project, considering Hydro One's evidence and the conclusions of

⁹ Application Evidence, Exhibit B-9-1, Pg. 1

¹⁰ Application Evidence, Exhibit B-9-1, Pg. 1-2

the IESO's SIA and Hydro One's CIA.

2.5 Land Matters

Hydro One filed a map of the Project illustrating the proposed route and the properties directly affected.

To meet Hydro One's line design standards, the Project requires a sufficient ROW width for construction. Hydro One plans to utilize existing occupational rights which will accommodate the necessary ROW.

The Project route requires land rights from five property owners. These owners collectively own a total of 20 properties, consisting of both privately and municipally held lands, as well as two railway crossings.

The new Project corridor will include a combination of the following land rights requirements:

- Hydro One statutory easements on Provincial owned (Bill 58) lands (no new land right required)
- Easement or fee simple rights on private and municipal properties (new land rights required)
- Rail crossing agreements (new land rights required)
- Temporary access and/or construction rights on provincially owned and private properties for access roads, temporary work headquarters, laydown areas and material storage facilities (new land rights required).

The 20 affected properties are presently vacant, and the proposed transmission corridor avoids traversing any dwellings or significant farm buildings. For the majority of these properties, Hydro One requires a permanent easement.

Table 4 lists the different land rights agreements that Hydro One has stated may be required, including details on the extent to which the agreements have previously been approved by the OEB. Hydro One has indicated that the forms remain materially unchanged.

Table 4. Land Rights Agreements and Prior OEB Approval

Form of Agreement	Past OEB Approval
Early Access Agreement	Prior approval in EB-2022-0140, no substantive changes proposed

Agreement for Temporary Rights	Prior approval in EB-2022-0140, no substantive changes proposed
Damage Claim Agreement/Waiver	Prior approval in EB-2022-0140, no substantive changes proposed
Option to Purchase a Limited Interest - Easement	Prior approval in EB-2022-0140, no substantive changes proposed
Compensation and Incentive Agreement- Easement	Prior approval in EB-2022-0140, no substantive changes proposed
Option to Purchase – Fee Simple	Prior approval in EB-2022-0140, no substantive changes proposed
Compensation and Incentive Agreement – Fee Simple	Prior approval in EB-2022-0140, no substantive changes proposed
Off Corridor Access	Prior approval in EB-2022-0140, no substantive changes proposed

Through staff interrogatories, Hydro One confirmed that it had secured option agreements on 19 of the affected 20 properties. Hydro One has yet to secure rights for Property PIN# 612280472, a property currently registered to a deceased person and therefore requiring title rectification from the Ministry of Mines.¹¹ However, efforts to acquire those rights remain underway and Hydro One expects to be able to secure those rights in a timely manner that will maintain the Project's in-service date.¹²

Submission

OEB staff submits that the maps that Hydro One has provided with the application satisfy the requirements of the Act and issue 6.1 of the [standard issue list](#) for leave to construct applications.

OEB staff supports Hydro One's proposed route and construction methodology for this Project. OEB staff is satisfied that this approach to refurbish parallel to the existing line is the more effective option for providing uninterrupted service to the line-connected industrial customers by reducing the number of required outages.

OEB staff has reviewed the proposed forms of agreements and has no major concerns. The agreements are generally consistent with the agreements approved by the OEB through previous proceedings¹³, however OEB staff identified one change where Hydro One's rationale is not clear.

¹¹ OEB Staff IR Responses, Exhibit 1-1-3, pg.1.

¹² *Ibid.*

¹³ EB-2022-0140 Decision and Order November 24, 2022 (Chatham Lakeshore Project)

In the 'Compensation and Incentive Agreement- Easement', OEB staff notes the removal of Valuation 1.(b), which addresses the adjustment of compensation based on changes in market conditions. Valuation 1.(b) is summarized as follows: Hydro One will adjust compensation for property if the time between the initial appraisal and project approval warrants it due to market changes. If an Option Agreement is in place before project approval, the property owner is entitled to this adjustment, known as the "Top-Up".¹⁴

Hydro One may choose to explain the rationale for this change as part of its reply to this submission. OEB staff also notes the potential risks in addressing title rectification for the remaining property (PIN# 612280472), including project delays, potential disputes, and cost overruns.

Hydro One confirmed that all impacted landowners have the option to receive independent legal advice regarding the land agreements.¹⁵

2.6 Conditions of Approval

The Act permits the OEB, when making an order, to impose such conditions as it considers proper. The OEB has established a set of [standard conditions of approval for transmission Leave to Construct applications](#).

Submission

OEB staff proposes that, if the application for leave to construct is approved, then the standard conditions of approval be placed on Hydro One. The proposed conditions have been approved by the OEB in prior leave to construct applications. Hydro One has confirmed that it agrees with the standard conditions of approval.¹⁶

3. Conclusion

OEB staff submits that Hydro One's leave to construct application for the Project should be granted subject to the conditions of approval proposed in this submission and that Hydro One's proposed forms of landowner agreements should be approved.

~All of which is respectfully submitted~

¹⁴ EB-2022-0140, Application Evidence, Exhibit E-1-1, pg.2

¹⁵ OEB Staff IR Responses, Exhibit 1-1-3, pg.1.

¹⁶ OEB Staff IR Responses, Exhibit 1-1-4, pg.1.