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BY EMAIL

October 24, 2023

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 Sault Ste. Marie Limited Partnership (HOSSM)
Application for leave to construct - refurbish the existing section of
electricity transmission line between Third Line Transformer Station and
Mackay Transformer Station
OEB File Number: EB-2023-0061**

Please find attached OEB staff's submission in the above referenced proceeding, pursuant to Procedural Order No. 2.

Yours truly,

Vithooshan Ganesanathan, Advisor
Generation & Transmission

Encl.

cc: All parties in EB-2023-0061



ONTARIO ENERGY BOARD

OEB Staff Submission

Hydro One Sault Ste. Marie Limited Partnership

**Application for leave to construct: refurbish the existing section of
electricity transmission line between Third Line Transformer Station
and Mackay Transformer Station**

EB-2023-0061

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1. Background and Overview

1.1 Overview of the Application

On June 15, 2023, Hydro One Sault Ste. Marie (HOSSM) applied to the Ontario Energy Board (OEB) for orders under sections 92 and 97 of the Ontario Energy Board Act (Act) for approval to refurbish approximately 90.5 kilometres of an existing 115 kV single-circuit transmission line between Third Line Transformer Station (TS) and Mackay TS and associated facilities in North-West Ontario (Project).

HOSSM also applied for approval of the forms of the agreement offered or to be offered to affected landowners if temporary construction rights for access or staging areas are required for the duration of the construction period.

HOSSM owns and operates a 115 kV single circuit that runs between Third Line TS and Mackay TS, connecting the areas of Montreal River and Sault Ste. Marie in North-West Ontario (Sault #3 line). The Sault #3 line consists of a wood pole line circuit, approximately 90.5 km in length, which is over 90 years old.

The Sault #3 line was placed in service in 1929 with a 266.8 kcmil Aluminum Conductor Steel Reinforced (ACSR) conductor and the portion of the line between Goulais Bay TS to Mackay TS still has this original conductor. The conductor section from Third Line TS to Goulais Bay TS was replaced in 1991 with a 336 kcmil ACSR conductor and is not proposed for replacement.

The proposed Project will replace approximately 69.3 km of existing 266.8 kcmil ACSR conductor with a 477 kcmil ACSR conductor between Mackay TS and Goulais Bay TS. The larger conductor size proposed by HOSSM is intended to reduce line losses when compared to the minimum standard conductor size of 411 kcmil. HOSSM also proposed to replace all existing wood pole structures along the entire length 90.5 km line between Mackay TS and Third Line TS.

1.2 Overview of OEB Staff Submission

OEB staff does not oppose HOSSM's section 92 request for leave to construct, subject to the standard conditions of approval set out in Section 2.6 of this submission. OEB staff supports HOSSM's section 97 request for approval of the forms of agreements it will offer to affected landowners. OEB staff's submission is provided in further detail below.

1.3 OEB’s Jurisdiction in Section 92 Applications

The criteria for the OEB’s considering of an application under section 92 is found in section 96 of the Act (note in particular subsection 96(2)):

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.

2. OEB Staff Submission

2.1 Project Need and Alternatives

The application states that the Project aims to reduce the safety and reliability risks associated with operating the Sault #3 line. The introduction of new conductor, shield wires, and wood pole structures is intended to improve the physical resilience of the transmission line against the increasing weather-related mechanical loads due to climate changes.

Between 2013 to 2015, there were three conductor sleeve failures on the 266.8 kcmil conductor (section between Mackay TS and Goulais Bay TS). A third-party failure analysis performed on the failed splice connections indicated that the conductor is in poor condition and near the end of its life. As a result, the Sault #3 circuit has been de-rated to 200 amps from the original design rating of 464 amps. The derating results in the restriction of load flow between Mackay TS and Third Line TS, and the conductor cannot be restored to its original design rating until the refurbishment of Sault #3 line is complete.

This Project was part of the HOSSM portfolio and refurbishment plan prior to Hydro One Networks Inc.'s (Hydro One) purchase of HOSSM (previously Great Lakes Power Transmission) in 2016. The need to re-conductor the Sault #3 line was identified in the Transmission System Plan (TSP) included in HOSSM's 2019 transmission rate application.¹ The TSP filed by HOSSM in the rate application planned for a like-for-like conductor replacement and minimal pole replacement. Since that time, the project progressed through the engineering development phase which has expanded the scope to include conductor upgrade between Goulais Bay TS and Mackay TS and wood pole replacement of the entire line between Third Line TS and Mackay TS.

The application indicates that the Independent Electricity System Operator (IESO) did not recommend upgrading the Sault #3 line beyond Hydro One's minimum standard conductor size for the purpose of meeting regional needs.² However, the IESO noted that HOSSM's identification of an end-of-life replacement is the key driver of the need for refurbishment and the purpose of the proposed project's conductor size is to mitigate

¹ EB-2018-0218.

² Exhibit B, Tab 3, Schedule 1, Attachment 1, p. 1 and IESO report "Relationship Between Hydro One Sault Ste. Marie's Sault No.3 Circuit Refurbishment and Regional and Bulk System Plans".

line losses.³

HOSSM considered five alternatives for the refurbishment of the Sault #3 line. The cost estimates for the alternatives were based on a Class 3 (estimation range of -20%/+30%) under the Association for the Advancement of Cost Engineering International estimate classification system. The key details of the alternatives have been summarized in the table below.

Table 1: Project Alternatives

	Existing 336 kcmil conductor between Third Line TS & Goulais Bay TS	Existing 266.8 kcmil conductor between Mackay TS & Goulais Bay TS	Capital cost (\$Million)	Annual line losses (MWh)	Total annual cost (\$Million)
Alternative 1	Retained	Replace w/ 411 kcmil conductor ⁴	68.72	5,032	5.69
Alternative 2 (preferred)	Retained	Replace w/ 477 kcmil conductor ⁵	68.81	4,476	5.65
Alternative 3	Replaced with 411 kcmil conductor	Replace w/ 411 kcmil conductor	69.43	4,484	5.73
Alternative 4	Replaced with 477 kcmil conductor	Replace w/ 477 kcmil conductor	69.56	4,179	5.68
Alternative 5	Retained	Replace w/ 732 kcmil conductor	74.57	3,288	5.97

HOSSM estimated the total annual cost for the alternatives by considering annual revenue costs and annual cost of losses.⁶ Although Alternative 1 was the lowest cost option based on capital cost only, Alternative 2, HOSSM's preferred alternative, was the lowest cost when the annual cost of line losses was taken into consideration.

HOSSM conducted a 50-year Net Present Value (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.

³ Upgrading the Sault #3 circuit beyond Hydro One's minimum standard conductor size to allow it to operate at 230 kV was considered as an option to address bulk and regional needs in the IESO's Northeast Bulk Plan and the IESO's East Lake Superior regional planning activities. As the IESO's regional planning initiatives did not find the upgrade option to be cost-effective for meeting the wider scope of the area's regional needs, and the Northeast Bulk Plan did not find it to be technically capable of meeting bulk system needs relative to other options, the IESO did not recommend upgrading the Sault #3 circuit beyond Hydro One's minimum standard conductor size to allow it to operate 230 kV.

⁴ A 411 kcmil conductor size is Hydro One's minimum standard size conductor for a 115 kV system.

⁵ A 477 kcmil conductor size is one standard size above HONI's minimum standard size conductor.

⁶ Cost of losses were calculated using a HOEP value of \$47.3/MWh.

Table 2: NPV Analysis

Energy Price \$/MWh	Alt 1	Alt 2 (preferred)	Alt 3	Alt 4	Alt 5
47.3	-63.18	-62.63	-63.58	-62.92	-66.15
89	-68.22	-67.11	-68.43	-67.11	-69.44
120	-71.96	-70.44	-72.04	-70.21	-71.88

According to HOSSM’s NPV analysis, Alternative 2 had the lowest NPV if losses were included at a HOEP of \$47.30/MWh. HOSSM noted that the results also show that Alternative 4 was equivalent to that of Alternative 2 at an energy price of \$89.00/MWh and became the lowest cost alternative at energy prices above this value. HOSSM noted that assuming a HOEP value of \$47.30/MWh is most appropriate given that it represents the average HOEP reported by the IESO for 2022.

Further, HOSSM stated that Alternative 2 addresses planned sustainment activities and minimizes transmission line losses. A conductor size of 477 kcmil ACSR conductor is one standard size above Hydro One’s minimum standard for a system operating voltage of 115 kV. HOSSM stated that the incremental cost increase of the proposed larger sized conductor will be offset by the line loss saving when compared to the minimum standard of 411 kcmil.

HOSSM also noted that increasing the conductor size in the proposed Project follows the terms of the settlement agreement in Hydro One’s 2023-2027 Custom IR Application which, among other things, requires the review of relevant planning standards to confirm that all cost-effective opportunities will be captured to reduce line losses when replacing infrastructure.⁷

Submission

OEB staff submits that the evidence has demonstrated the need for the refurbishment of the Sault #3 line to replace end-of-life facilities so that the area continues to receive a safe and reliable supply of electricity. OEB staff submits that the third-party conductor sleeve failure analysis in the pre-filed evidence supports the need for the Project.

OEB staff agrees with HOSSM’s approach to adopt larger conductor sizes, relative to minimum standards, where cost effective. However, according to OEB staff it is unclear

⁷ EB-2021-0110 - Hydro One Networks’ 2023-2027 Custom IR Application, Settlement Proposal – Appendix A, October 24, 2022, pp. 110-111.

whether Alternative 2 or Alternative 4 is the suitable solution.

HOSSM's basis for recommending Alternative 2 is that the option is the most cost effective by balancing capital costs relative to line losses. OEB staff notes the cost differences between Alternative 2 and Alternative 4 are marginal. Alternative 4 has slightly higher capital costs (1% higher). Similarly, the difference in the NPV analysis for line losses is also marginal. The NPV scenarios range from Alternative 2 being 0.5%⁸ less expensive than Alternative 4 which is 0.3%⁹ less expensive.

OEB staff notes that there is no material cost difference between Alternative 2 and Alternative 4 and OEB staff does not oppose Hydro One selecting Alternative 2 as the proposed option as a result.

2.2 Project Cost

The estimated project capital cost is \$68.8 million, including \$59.3 million for line work, \$4.2 for station work and \$5.3 million for removal costs.

HOSSM's estimated project cost includes a contingency amount in recognition of risks. Key project risks include outage constraints, adverse weather, scope additions, and approvals and permit.

In relation to the line work, HOSSM cited three recent single circuit 115 kV wood pole line refurbishment projects in Northern Ontario: D2L Line Refurbishment, A7L/R1LB/A6P Line Refurbishment, and the Kapuskasing Area Reinforcement projects.

The total project costs per circuit km of the comparator projects were between \$429K¹⁰ and \$488K, while HOSSM estimated the Sault #3 line will cost \$655K per circuit km.

HOSSM stated that the higher cost per km forecasted for the Sault #3 line relative to the three comparators is due to price increases for essential commodities that need to be used in the Project (i.e., copper, aluminum, wood, and steel) and global supply chain issues. HOSSM included an "Escalation Adjustment" to inflate costs for future years consistent with the OEB's inflation parameters. HOSSM further stated that although these parameters are based on historical data and do not reflect true inflation, they were used to maintain a conservative escalation adjustment.

In relation to the station work, HOSSM stated that due to the unique scope of work for the station-related component for the Sault #3 line, HOSSM has not provided station

⁸ This refers to the NPV analysis assuming HOEP of \$47.30/MWh.

⁹ This refers to the NPV analysis assuming HOEP of \$120/MWh.

¹⁰ HOSSM updated the project cost per circuit km analysis for the D2L Line Refurbishment, a comparator project, in OEB Staff Interrogatory 4a).

comparators in this application.

Submission

OEB staff does not oppose the estimated costs for the proposed Project.

However, OEB staff notes that the line portion cost of the proposed Project is 34% to 53% higher than the comparator projects. HOSSM stated that the higher project costs were caused by price increases for essential commodities and global supply chain issues. While HOSSM has included an escalation adjustment based on OEB's historic inflation parameters, HOSSM suggests that the adjustment does not fully capture the inflationary pressures it is facing.

OEB staff observes that in two recent Leave to Construct applications (Chatham by Lakeshore Transmission Line project¹¹ and Richview TS by Manby TS Line Rebuild project¹²) higher line project costs were attributed to similar reasons noted by HOSSM – price increases for essential commodities and global supply chain issues. However, the line portion of the project costs for both of these Leave to Construct applications were within the range of their respective comparators on a per unit km basis.

OEB staff notes that the rationale provided by HOSSM for Project costs much higher than the comparator projects is the same rationale that was provided for higher estimated line costs in the two other recent cases which, as noted above, were still within the range of the comparators.¹³ In the absence of additional details substantiating the higher Project costs relative to the comparator projects in this case, OEB staff can neither support nor dispute the cost estimates or underlying rationale.

OEB staff notes that, if the Project is approved, the Project costs that are sought for recovery will be subject to review in HOSSM's subsequent cost-based transmission revenue requirement proceeding. OEB staff suggests that, if the higher costs materialize as this application anticipates, HOSSM should include evidence at a sufficiently granular level to substantiate the higher costs in the future revenue requirement application, so that the prudence of incremental costs can be reviewed.

OEB staff notes that HOSSM has not provided station comparators for the station-related component of the Project. HOSSM explained that it was not able to provide station comparators because of the unique scope of work for the station-related component in the Project. OEB staff submits that the rationale provided by HOSSM for being unable to provide station comparators is reasonable.

¹¹ EB-2022-0140.

¹² EB-2023-0199.

¹³ EB-2022-0140 and EB-2023-0199.

2.3 Consumer Impacts

The application states that the proposed Project costs involve the replacement of conductor, shield wires and wood structures. The cost for the upgrade of the Sault #3 line will be included in the network connection pool for cost classification purposes and not allocated to any individual customer. No customer contribution is required for the Project. There are no incremental operating and maintenance costs as a result of the proposed Project since activities such as vegetation management and inspection will not be materially impacted by the reconductoring of existing circuits.

HOSSM stated that based on the cost allocation methodology as approved by the OEB¹⁴ and detailed in Hydro One's most recent transmission rate filing,¹⁵ the Sault #3 line is allocated 100% to the network pool.

The need to upgrade the Sault #3 line between Goulais Bay TS and Mackay TS is for line loss optimization purposes. Therefore, the cost of the Project is not to be applied to any particular customer.

HOSSM estimated that the Project will change the network connection pool revenue requirement once it is incorporated into the transmission rate base when the Project is in-service (September 2026). Over a 25-year time horizon, HOSSM anticipates that the Project will increase the current network rate of \$5.60 kW/month to an average rate of \$5.62 kW/month.

HOSSM estimated that the project will increase the typical residential customer bill by \$0.03 per month or 0.02%. This amounts to an increase of approximately \$0.4 per year.

Submission

OEB staff submits that HOSSM's proposed allocation of Project costs to the network connection rate pool is appropriate. OEB staff takes no issue with HOSSM's position that no customer contribution is required.

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

OEB staff also submits that HOSSM's evidence suggests that the project will have a relatively modest impact on customers.

¹⁴ EB-2016-0160.

¹⁵ EB-2019-0082, Exhibit I, Tab 10, Schedule 50, Page 2 of 2, Filed August 2, 2019.

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, provided that all requirements in the SIA report are implemented.

In the SIA report, the IESO stated that despite the conductor size being increased with this Project, when the loss of circuit K24G¹⁶ occurs, the flow of electricity from K24G transfers to Sault #3 line and causes it to become overloaded (exceeding the Short Term Rating).

To mitigate the overloading issue, the IESO stated that the existing Mackay TS – No #3 Sault 115 kV – Generation Rejection Scheme will need to ensure that the breakers protecting the Sault #3 line at Mackay TS are opened for the loss of circuit K24G. The SIA states that HOSSM will need to satisfy all applicable requirements specified in the Market Rules, the Transmission System Code and reliability standards. Some of the general requirements that are applicable to the Project are presented in detail in Appendix A: General Requirements of the SIA.

HOSSM's Final Customer Impact Assessment (CIA) concluded that the Project will not have any adverse effects on HOSSM's existing connected transmission customers in the vicinity.

Submission

OEB staff does not have any concerns about the reliability and quality of service associated with the Project, considering HOSSM's evidence and the conclusions of the IESO's SIA and HOSSM's CIA.

2.5 Route Maps and Landowner Agreements

HOSSM filed a map of the route for the Project with the application. The proposed Project will be executed within an existing transmission corridor over which HOSSM (through Hydro One Sault Ste. Marie Holding Corp.) has existing rights. The Project work will be executed within the existing corridor and it is not expected that additional corridor rights are required.

HOSSM stated that, if necessary, further temporary off-corridor access or construction requirements will be negotiated with any affected landowner. Furthermore, any additional temporary off-corridor requirements (including, but not limited to construction staging areas, access, flagging and permitting) will be obtained by the Project construction contractor with affected property owners.

¹⁶ K24G is a 230 kV circuit that runs parallel to the Sault #3 transmission line along its entire route.

HOSSM requested OEB approval of three land-related agreements that may be required, if temporary construction rights for access or staging areas are required:

- Temporary Access and Temporary Access Road
- Temporary Rights Agreement
- Full and Final Release form

HOSSM stated that the form of these agreements have been approved by the OEB in previous leave to construct applications.

Submission

OEB staff submits that the route maps submitted by HOSSM meet the OEB's requirements. OEB staff has also reviewed the proposed forms of agreements and has no issues or concerns. The forms of agreements are generally consistent with the agreements approved by the OEB through previous proceedings.¹⁷

HOSSM confirmed that all impacted landowners have the option to receive independent legal advice regarding the proposed land rights agreements, and that it would commit to reimbursing landowners for reasonably incurred legal fees associated with the review and completion of the necessary land rights agreements.¹⁸

On October 16, 2023, after the interrogatory stage of the proceeding concluded, one of the intervenors, Perimeter Forest Limited Partnership (PFLP) requested clarification about an interrogatory response provided by HOSSM.¹⁹ OEB staff notes that the clarification question relates to an existing easement agreement between PFLP and HOSSM (PFLP Easement) and a Maintenance and Repair Cost Contribution Agreement that is supposed to be entered into according to the PFLP Easement. OEB staff notes that the clarification question relates to the existing PFLP Easement and not a form of land agreement for which OEB approval is sought as part of this proceeding. OEB staff does not have any comments on the PFLP Easement but HOSSM may want to address the clarification question in its reply submission.

2.6 Conditions of Approval

The OEB 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](#).

¹⁷ EB-2021-0107.

¹⁸ Interrogatory Response to OEB Staff 2(c) – (d).

¹⁹ Interrogatory Response to PFLP 9(c) – (d).

Submission

OEB staff proposes that the standard conditions of approval be placed on HOSSM. The proposed conditions have been approved by the OEB in prior leave to construct applications. HOSSM has confirmed that it agrees with the standard conditions of approval.²⁰

3. Conclusion

OEB staff submits that it does not oppose HOSSM's leave to construct application for the Project subject to the conditions of approval proposed in this submission. OEB staff submits that, if the OEB grants leave to construct the Project, HOSSM's proposed forms of landowner agreements should be approved.

~All of which is respectfully submitted~

²⁰ Interrogatory Response to OEB Staff Interrogatory 3a).