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BY EMAIL

February 10, 2021

Ms. Christine E. Long
Registrar
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4
registrar@oeb.ca

Dear Ms. Long:

**Re: Hydro One Networks Inc. (Hydro One)
Leave to Construct Application – Hawthorne to Merivale
Reconductoring Project
OEB Staff Interrogatories
Ontario Energy Board File Number: EB-2020-0265**

In accordance with Procedural Order No. 1, please find attached the OEB staff interrogatories for the above proceeding. This document has been sent to Hydro One and to all other registered parties to this proceeding.

Hydro One is reminded that its responses to interrogatories are due by February 26, 2021. Responses to interrogatories, including supporting documentation, must not include personal information unless filed in accordance with rule 9A of the OEB's Rules of Practice and Procedure.

Yours truly,

Original Signed By

Andrew Bishop

Andrew Bishop
Project Advisor, Generation & Transmission

Encl.

Hydro One Networks Inc.
Leave to Construct Application – Hawthorne to Merivale
Reconductoring Project
EB-2020-0265
February 10, 2021

OEB Staff-1:

Ref: (1) Exhibit B, Tab 2, Schedule 1, page 1

Preamble:

The reference above states that the IESO “has identified the need for an increased power transfer limit across the two M30A and M31A circuits to address the need to facilitate bulk power flows from eastern Ontario, including eastern Ontario generation, towards the GTA.”

Question(s):

- a) What criteria stipulate the capability required to facilitate bulk power flows from eastern Ontario, including eastern Ontario generation, towards the GTA across circuits M30A and M31A?
- b) What is the statistical frequency and magnitude of power transfer capability insufficiency across circuits M30A and M31A with respect to bulk power flows from eastern Ontario, including eastern Ontario generation, towards the GTA and how does it compare to applicable criteria?
- c) If the Hawthorne to Merivale reconductoring project is implemented, what will the expected statistical frequency and magnitude be? (i.e., of power transfer capability insufficiency across circuits M30A and M31A with respect to bulk power flows from eastern Ontario, including eastern Ontario generation, towards the GTA).
- d) Please identify the specific areas within or around the GTA that will benefit from the bulk power flows enabled by the Hawthorne to Merivale reconductoring project and indicate what those benefits will be

OEB Staff-2:

Ref: (1) Exhibit B, Tab 2, Schedule 1, page 1

Question(s):

- a) Has the IESO developed a business case to show the costs and benefits of upgrading circuits M30A and M31A to facilitate bulk power flows from eastern Ontario, including eastern Ontario generation, towards the GTA? If so, please summarize and provide the business case.
- b) Based on the IESO's analysis, please indicate how much power flow would be facilitated by the proposed upgrade and what value the additional power flow would provide Ontario ratepayers annually (e.g. compared to a status quo scenario).
- c) Did the IESO compare the suitability, costs and benefits on non-wires alternatives or distribution system alternatives for achieving similar outcomes? If so, please comment.
- d) If applicable, why was a transmission wires alternative recommended?

OEB Staff-3:

Ref: (1) Exhibit B, Tab 2, Schedule 1

Question(s):

- a) When were circuits M30A/M31A between Hawthorne TS and Merivale TS placed into service?
- b) If not for the Hawthorne to Merivale reconductoring project, when would circuits M30A/M31A between Hawthorne TS and Merivale TS be expected to reach their end-of-life?
- c) Please estimate the remaining depreciation cost of existing circuits M30A/M31A between Hawthorne TS and Merivale TS between:

- i. the time they are decommissioned as part of the Hawthorne to Merivale reconductoring project; and
 - ii. the time they are expected to reach end of life.
- d) How has the cost of depreciation/remaining value of existing circuits M30A and M31A been factored into the IESO's cost benefit analysis of upgrading circuits M30A and M31A to facilitate bulk power flows from eastern Ontario, including eastern Ontario generation, towards the GTA?
- e) Please comment on whether and how Hydro One proposes to recover any remaining depreciation amount through rates.

OEB Staff-4:

Ref: (1) Exhibit B, Tab 3, Schedule 1, Attachment 1, pages 1 & 2

Preamble:

The IESO states at the above reference that circuits M30A and M31A are “critical for supplying customers in the western half of the City of Ottawa and providing a transmission path for a **portion** of the power transfers between Eastern Ontario and the Greater Toronto Area” and that limitations on circuits M30A and M31A will have an “impact” on “utilization of resources in Eastern Ontario for regional or system needs”.
[**emphasis added**]

Question(s):

- a) Please specify the portion of power transfers between Eastern Ontario and the GTA served by circuits M30A and M31A.
- b) Please indicate which specific resources in eastern Ontario are being referred to in the above reference.
- c) Please comment on and quantify, how frequently, and by how much the utilization of the resources referenced above is impacted by limitations on circuits M30A and M31A.

- d) Please describe, and if possible quantify, the implications to Ontario customers of impacts on the utilization of the resources referenced above caused by limitations on circuits M30A and M31A.
- e) How is the impact of existing limitations (i.e. in the absence of the proposed upgrade) on circuits M30A and M31A on the utilization of resources in eastern Ontario for regional or system needs forecast to change over the next 15 years?
- f) Please comment on the timing of the proposed upgrade relative to the information provided in response to part d).

OEB Staff-5:

Ref: (1) Exhibit B, Tab 3, Schedule 1, page 2

Preamble:

The reference above notes that reinforcement of the M30A and M31A circuits would enable capacity imports from Quebec.

Question(s):

- a) Please confirm that in this context, capacity imports from Quebec refer to contract-based or capacity market-based capacity imports.
- b) Please clarify how capacity imports differ from the energy imports from Quebec that are currently scheduled in the real-time market.
- c) Does Ontario currently hold a contract with Quebec for capacity imports?
- d) Does Ontario currently have a capacity market that could source capacity imports from Quebec?
- e) Are there firm plans to secure a contract with Quebec for capacity imports within the next five years?
- f) If the answer to part (d) above is “no”, are there firm plans to establish a capacity market within the next five years that could source capacity imports from Quebec?

- g) Is the reinforcement of the M30A and M31A circuits the only investment that would be required to enable capacity imports from Quebec, or are there other upstream or downstream investments that would also be required?
- h) If additional investments are required, please describe the nature of the limitations to be addressed (e.g. thermal, voltage).
- i) Is the Hawthorne to Merivale Reconductoring project the only feasible way of enabling capacity imports from Quebec? If no, has the IESO considered alternative ways? Please describe any alternatives that have been considered.

OEB Staff-6:

Ref: (1) Exhibit B, Tab 3, Schedule 1, Attachment 1, page 2

Preamble:

The IESO states at the above reference that circuits M30A and M31A “are inadequate today to supply the demand in west Ottawa” and that the “overload will become more severe in the longer term as the demand in west Ottawa is forecast to increase by about 150 MW in the next 10 years”.

Question(s):

- a) The IESO letter indicates that it supports Hydro One’s targeted in-service date for the Hawthorne to Merivale reconductoring project of December 2022. However, the application indicates that the project will not be in-service until December 2023.
 - a. Why did Hydro One change the in-service date to 2023?
 - b. Does this delay create service reliability concerns/issues for consumers in west Ottawa and/or the IESO from a system management perspective?
- b) Please define “west Ottawa” (e.g. show regional boundaries). Which transformer stations or other customer connections are included in this area?

- c) Please provide five years of historical demand and 15 years of demand forecast information for west Ottawa. With respect to the provided information, please specify:
 - i. When the forecast was produced; and
 - ii. How this forecast compares to the forecast described in the above reference
- d) How much of west Ottawa's demand are existing circuits M30A and M31A capable of supplying? What year did, or will, the above forecast exceed that capability? Please identify the basis/source of your response.
- e) Please describe the existing inadequacy of circuits M30A and M31A to supply the demand in west Ottawa. When responding, please specify the drivers of the inadequacy, how frequently the circuits are inadequate, and the degree/magnitude of the inadequacy as it relates to demand in west Ottawa.
- f) What criteria stipulate the capability required on circuits M30A and M31A to supply the demand in west Ottawa? How would the IESO or Hydro One characterize the extent to which the criteria are currently exceeded?
 - i. How does the IESO or Hydro One forecast this characterization to change over the next 5, 10, and 15-years? What is the basis for this forecast?
- g) How would the Hawthorne to Merivale reconductoring project help satisfy applicable criteria related to the reliability of supply to west Ottawa?
- h) Please comment on whether the Hawthorne to Merivale reconductoring project was recommended in a regional plan and how the supply to west Ottawa figured into that recommendation. If yes, please provide the regional plan and indicate whether its findings remain valid.

OEB Staff-7:

Ref: (1) Exhibit B, Tab 6, Schedule 1, page 2

Preamble:

The above reference notes that limitations on circuits M30A and M31A may cause the need for “operational measures that have the potential to reduce the reliability of supply to Ottawa customers”.

Question(s):

- a) Please describe the types of operational measures referred to above and comment on the conditions and drivers causing their need.
 - i. If applicable, please indicate how frequently these operational measures are taken.
- b) Please specify why these operational measures have the potential to reduce the reliability of supply to Ottawa customers.
 - i. To-date, has reliability been jeopardized as a result of these operational measures being enacted?
- c) Please confirm that such operational measures, if enacted, would belong to a set of measures that are currently permitted by applicable reliability standards and operating practices.
- d) Please confirm that the Hawthorne to Merivale reconductoring project would reduce (and by how much) or eliminate the likelihood that such operational measures would be required.

OEB Staff-8:

Ref: (1) Exhibit B / Tab 3 / Schedule 1 / Attachment 1
(2) Exhibit B / Tab 5 / Schedule 1

Question(s):

- a) Are circuits M30A and M31A the only sources of supply to west Ottawa? If no, please identify and describe the other sources.
- b) Is the Hawthorne to Merivale reconductoring project the only feasible way of increasing supply to west Ottawa?
 - i. Please identify the source/basis of your response.
- c) If the answer to b) is 'no', please describe the feasible alternatives, including distribution and/or non-wires alternatives. Please explain why the Hawthorne to Merivale reconductoring project is the preferred means of increasing supply to west Ottawa.
- d) Please describe the benefits of dual bundled conductors generally, as well as in the context of the Hawthorne to Merivale reconductoring project.
- e) Was a non-bundled conductor option(s) investigated as an alternative? If not, why not? If applicable:
 - i. Did Hydro One identify the non-bundled option(s) investigated as capable or incapable of meeting the objectives of the Hawthorne to Merivale reconductoring project as described in the IESO letter? Please fully explain the rationale supporting Hydro One's determination.
 - ii. What was the cost of the non-bundled option(s)?
 - iii. Would the non-bundled option(s) require the tower arm reinforcement as proposed for the Hawthorne to Merivale reconductoring project?
 - iv. Please provide a cost/benefit analysis of the non-bundled option(s) considered.

OEB Staff-9:

Ref: (1) Exhibit B, Tab 6, Schedule 1, page 1

Preamble:

The Hawthorne to Merivale reconductoring project includes the replacement of the M31A sky-wire (non-OPGW capable) with OPGW. The reference above states that the OPGW “will provide redundancy to the teleprotection system required by NERC and NPCC”.

Question(s):

- a) Please clarify the purpose and function of the new OPGW proposed for the M31A skywire and, more broadly, of the teleprotection system it would be part of.
 - i. Why has Hydro One only proposed to replace the skywire on M31A?
 - ii. If there is currently a skywire on M30A, why has Hydro One decided against replacing it?
- b) Please clarify whether the NERC and NPCC requirement at the above reference relates to the existence of a teleprotection system (i.e., that there should be a teleprotection system) or to the redundancy of an existing teleprotection system (i.e., that where there is a teleprotection system, it must be redundant).
- c) If not required by NERC and NPCC, please comment on why Hydro One proposes to replace the M31A skywire with a new OPGW and what the benefit would be.
- d) Was the M31A skywire replacement previously identified in a Hydro One transmission plan or in a regional plan or planning study? If yes, please provide the applicable regional plan(s)/planning study(ies) and indicate whether its/their findings remain valid.
- e) If Hydro One did not reconductor circuits M30A and M31A, when, if at all, would it otherwise replace the M31A skywire with OPGW?
- f) How much remaining life does the existing M31A skywire have? What is the approximate cost of a like-for-like (non-OPGW) replacement? What is the

approximate cost that remains to be recovered for the existing M31A skywire as of the time of construction start on the Hawthorne to Merivale reconductoring project?

- i. If existing non-OPGW costs have yet to be recovered, how does Hydro One plan to recover these costs?

OEB Staff-10

Ref: (1) Exhibit B, Tab 9, Schedule 1, page 3

Preamble:

The table at the above noted reference estimates the impact of the Hawthorne to Merivale reconductoring project on the typical residential customer. The estimate assumes a residential consumption of 1,000 kWh per month.

Question(s):

- a) Please provide a second table showing impacts assuming a residential consumption of 700 kWh per month.

OEB Staff-11

Ref: (1) Exhibit E, Tab 1, Schedule 1, page 4
(2) Exhibit E, Tab 1, Schedule 1, Attachment 3
(3) Exhibit E, Tab 1, Schedule 1, Attachment 4
(4) EB-2018-0117, Exhibit E, Tab 1, Schedule 1, Attachment 3
(5) EB-2018-0117, Exhibit E, Tab 1, Schedule 1, Attachment 7
(6) EB-2019-0077, Exhibit E, Tab 1, Schedule 1, Attachment 2
(7) EB-2019-0077, Exhibit E, Tab 1, Schedule 1, Attachment 8

Preamble:

Hydro One has applied for approval of the forms of the agreement offered or to be offered to affected landowners pursuant to s.97 of the OEB Act. Hydro One states that two of its proposed land agreements were approved by the OEB under files EB-2018-0117 and EB-2019-0077.

Question(s):

- a) Please confirm that the forms of agreement Hydro One seeks approval of at references 2 and 3 correspond, respectively, to the forms of agreement approved under EB-2018-0117 at references 4 and 5 above and to forms approved under EB-2019-0077 at references 6 and 7 above.
- b) Please advise whether there are any substantive differences between the previously approved forms of agreement referenced above and the forms of agreement that Hydro One requests approval of as part of the Hawthorne to Merivale reconductoring project, and explain any such differences.

OEB Staff-12

Ref: (1) Exhibit E, Tab 1, Schedule 1

Preamble:

The reference above identifies the land right agreements that Hydro One proposes to use to obtain any identified land rights for the Hawthorne to Merivale reconductoring project.

Question(s):

- a) Please confirm that all impacted landowners will have the option to receive independent legal advice regarding the proposed land agreements.
- b) Please clarify whether Hydro One has committed to or will commit to reimbursing landowners for reasonably incurred legal fees associated with the review and execution of the necessary land rights agreements.

OEB Staff-13

Ref: (1) Exhibit B, Tab 1, Schedule 1

Preamble:

Hydro One has applied for leave to construct approval pursuant to s.92 of the OEB Act.

Question(s):

- a) Please comment on the following draft conditions of approval proposed by OEB staff. If Hydro One does not agree with any of the draft conditions of approval noted below, please identify the specific conditions that Hydro One disagrees with and explain why. For conditions in respect of which Hydro One would like to recommend changes, please provide the proposed changes.
1. Hydro One shall fulfill any requirements of the SIA and the CIA, and shall obtain all necessary approvals, permits, licences, certificates, agreements and rights required to construct, operate and maintain the project.
 2. Unless otherwise ordered by the OEB, authorization for leave to construct shall terminate 12 months from the date of the Decision and Order, unless construction has commenced prior to that date.
 3. Hydro One shall advise the OEB of any proposed material change in the project, including but not limited to changes in: the proposed route, construction schedule, necessary environmental assessment approvals, and all other approvals, permits, licences, certificates and rights required to construct the project.
 4. Hydro One shall submit to the OEB written confirmation of the completion of the project construction. This written confirmation shall be provided within one month of the completion of construction.
 5. Hydro One shall designate one of their employees as project manager who will be the point of contact for these conditions, and shall provide the employee's name and contact information to the OEB and to all affected landowners, and shall clearly post the project manager's contact information in a prominent place at the construction site.

OEB Staff-14:

Ref: (1) Exhibit B, Tab 9, Schedule 1, pages 1 and 2
(2) Exhibit B, Tab 3, Schedule 1, Attachment 1

Preamble:

At the above reference, Hydro One states that:

Hydro One's M30A and M31A 230 kV circuits are network circuits linking the electrical system between two main transformer stations (Hawthorne TS and Merivale TS) located in Ottawa. The circuits are used primarily to transfer bulk power from eastern Ontario to the GTA, including eastern Ontario generation. The Project will address the IESO identified capacity need for Ontario, facilitating current and future load requirements of the network. ***This is a system project that is not tied to any particular load increase or customer load application and is intended to relieve the current bulk power transfer limitation. As such, the proposed line upgrade is included in the Network Pool and no customer capital contributions are required, consistent with the provisions of Section 6.3.5 of the Transmission System Code.*** [emphasis added]

Question(s):

- a) The IESO letter, provided at Exhibit B, Tab 3, Schedule 1, Attachment 1, identified that the proposed project would serve several purposes, including a "critical" role in supplying customers in the western half of the City of Ottawa. Specifically, the IESO letter states that "Upgrading the M30/31A circuits will allow the load in west Ottawa to be supplied reliably with sufficient capacity to meet forecast demand growth...".
 - i. Please explain the seeming inconsistency between the IESO letter and Hydro One's referenced statement with respect to the need for the project not being tied to customer load growth in west Ottawa. When responding, please identify the degree to which Hydro One considers load growth in west Ottawa as a driver for the project.
- b) Hydro One states that the proposed project requires no customer capital contributions on the basis that it is not tied to any particular load increase or customer load application. In light of the IESO letter that identified a primary driver of the project to be its ability to serve increasing demand in west Ottawa, please justify this statement.

OEB Staff-15:

- Ref: (1) Exhibit B, Tab 7, Schedule 1, page 6
(2) Exhibit B, Tab 2, Schedule 1, page 6
(3) Exhibit C, Tab 1, Schedule 1, page 1
(4) EB-2016-0325: Exhibit B, Tab 7, Schedule 1

Preamble:

Table 2 presented at the above reference (1) has been extracted and shown below.

Table 1: Extract from Exhibit B, Tab 7, Schedule 1, page 6

Project	HMR Project	WTTE Project	D6V/D7V Project	DxS Project
Technical	Reconductor of double circuit 230 kV dual-bundled conductor (on two separate towers)	Reconductor of mostly quad 115kV circuit line	Reconductor of double circuit 230 kV line	Reconductor of double circuit 115kV line
Length (km)	11.9	10.0	9.4	9.0
Circuit km length (km) ⁴	23.8	40.0	18.8	18.0
Project Surroundings	Mostly urban: residential & commercial Multiple road crossings	Urban	Mostly rural	Mostly urban
In-Service Date	Dec-23	Nov-18	Dec-20	Dec-15
Years for escalation	-	5 yrs, 1 mth	3 yrs	8 yrs
Total Project Cost (\$M)⁵	21.3	21.4	8.6	6.3
Less: Bypass (\$M)	0.2	-	-	0.2
Less: OPGW termination work (\$M)	1.0	-	-	-
Less: OPGW/Skywire (\$M) ⁶	1.6	0.3	0.3	0.8
Total Project Costs Before escalation (\$M)	18.7	21.1	8.3	5.3
Add: Escalation Adjustment (2%/year)	-	2.2	0.5	0.9
Total Comparable Project Costs (\$M)	18.7	23.3	8.8	6.2
Total Cost/Circuit km (\$M)	0.8	0.6	0.5	0.3

Question(s):

- a) Column 3 of the referenced table indicates an actual total project cost of \$21.4 million for the West Toronto Transmission Enhancement (WTTE) project. At Exhibit B, Tab 7, Schedule 1 of Hydro One's WTTE application (EB-2016-0325), Hydro One estimated that the total capital cost of the line work component of the WTTE project, including overheads and capitalized interest, would be \$29.3 million. Please describe the reasons for the difference between the actual costs shown in the above referenced table and the estimate provided in the WTTE application.

- b) At reference (b), Hydro One indicates that the project will require minor work at the Hawthorne and Merivale transmission stations which connect the lines being reconducted.
- i. Please indicate if the Hawthorne to Merivale reconductoring project costs shown in the table above include the costs of the required transmission station work.
 - ii. Please indicate if the project costs shown in the table above for each comparator project are inclusive or exclusive of required transmission station work.
- c) At reference (c), Hydro One states that the current 230 kV supporting tower arms will require replacement with stronger arms capable of safely carrying the new dual-conductor bundled 230 kV per phase configuration.
- i. Please confirm if the costs of the replacement tower arms are reflected in the Hawthorne to Merivale reconductoring project costs shown in the above table.
 - ii. Please confirm if the costs of any of the comparator projects shown in the above table include the costs associated with tower reinforcement work that is the same/similar to that required for the Hawthorne to Merivale reconductoring project.
 - iii. Please remove the costs of the replacement tower arms if the comparator projects did not incur such costs.
 - iv. Please confirm that, as part of the project, only the arm on one side of each tower requires upgrading and that no other upgrades are necessary, including to the towers themselves. If tower upgrades (or other in addition to the tower arms) are necessary, please confirm if their costs are represented in the current total project cost estimate of \$21.3 million. If not represented, please provide an updated project cost estimate inclusive of all necessary tower upgrades.
- d) The referenced table indicates that the Hawthorne to Merivale reconductoring project will incur a cost of \$1 million and \$1.6 million for OPGW termination work and OPGW/Skywire, respectively.
- i. Please briefly describe the work and/or equipment associated with the “OPGW termination work” and “OPGW/Skywire” line items.
 - ii. Please describe the reasons for the difference between the amounts shown in the “OPGW termination work” and “OPGW/Skywire” line items between the Hawthorne to Merivale reconductoring project and all comparator projects.

- e) For comparison purposes, please provide the per kilometre costs of a dual bundled 230 kV conductor (such as that proposed for the Hawthorne Merivale project) and the costs of a quad bundled 115 kV conductor (such as that installed for the WTTE project).