

February 1, 2019

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Dear Robert:

Upgrading 230 kV Circuits M30/31A between Hawthorne TS and Merivale TS in Ottawa

The purpose of this letter is to request Hydro One Networks Inc. to proceed with the upgrading of 230 kV circuits M30A and M31A (M30/31A) between Hawthorne TS and Merivale TS in the City of Ottawa. These circuits 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.

Upgrading the M30/31A circuits will allow the load in west Ottawa to be supplied reliably with sufficient capacity to meet forecast demand growth while facilitating bulk power transfers from generation and imports located in Eastern Ontario for use efficiently and effectively across the Ontario grid. Additionally, the proposed upgrade would allow imports from Québec to participate in future capacity auctions in the Ontario Electricity Market. The upgrade will also increase the security of the Ottawa Area electricity supply by providing additional transfer capacity between the Hawthorne and Merivale stations to better mitigate outages to key line or station facilities in the area.

Background

The Hawthorne TS to Merivale TS (HxM) transmission path comprises, two 230 kV circuits and two 115 kV circuits between Hawthorne TS and Merivale TS in the City of Ottawa as shown in Figure 1. This path is also shared with two 500 kV circuits from Lennox TS to Hawthorne TS. Physically, these circuits are carried on two tower lines between the two stations, about 12 km in length. Each tower line carries three circuits at three different voltage levels.

Due to the nature of the power system in Ottawa and Eastern Ontario, the HxM path performs multiple functions with regard to electricity supply in Ottawa and across Eastern Ontario. Hawthorne is the terminus of the 500 kV circuits from Kingston and the delivery point for much of the generation resources and interconnections in the Cornwall and Ottawa areas. As a result, the 230 kV circuits M30/31A and the 115 kV circuits A8M and A3RM on the HxM path connect and supply much of the load demands in west Ottawa, including those in Nepean, Kanata and Downtown Ottawa, from the Hawthorne station located in east Ottawa. As well, the M30/31A

230 kV circuits on the HxM path carry a portion of the bulk power transfers between Eastern Ontario and the Greater Toronto Area. Limitations on the M30/31A circuits will impact the reliability of supply to loads in west Ottawa and utilization of resources in Eastern Ontario for regional or system needs.

In the past years, the M30/31A circuits have been operating near capacity at the time of summer peak supplying the peak demand of loads in the Ottawa area and carrying transfers from Ontario generating resources located in Eastern Ontario to the rest of the Ontario grid. As a result, there has been no capability to receive capacity imports from Québec during the summer peak periods and transactions with Québec can only currently occur in the form of energy imports.

In 2014¹, the IESO conducted a review of Ontario's interconnections with its neighbours, including those with Québec. Subsequently, in 2017², the IESO conducted a follow-up technical review focused in more detail on the Ontario-Québec interconnections. Both reviews identified that the main impediment to enabling capacity imports from Québec is the limitation of the HxM path and reinforcement of this path would be necessary to mitigate this restriction. No action was initiated after the 2017 review as the transactions with Québec in the past years were mostly related to energy rather than capacity.

Need and Alternatives

Recently, a demand forecast for the Ottawa Area was updated as part of regional planning for the Ottawa area. With this latest demand forecast and the latest information on Eastern Ontario resources including the new Napanee generating station in Kingston, load flow studies indicate that the M30/31A circuits are inadequate today to supply the demand in west Ottawa and the required bulk power transfers under summer peak conditions. These studies assumed no imports from Québec. Furthermore, 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.

A number of reinforcement options were considered for relieving the M30/31A limitations in IESO's 2014 Interconnections report. One was to build underground cables between the Hawthorne and Merivale stations at a cost of about \$300 million. Another option was to build a double circuit 230 kV line from the St. Lawrence area into Ottawa, at a cost of up to \$500 million depending on the option chosen. As reported in the 2017 Interconnection report, detailed engineering studies done by Hydro One indicated that the overhead M30/31A circuits are capable of being uprated by replacing the existing conductors with twin conductors at a cost of about \$20 million.

Preferred Solution

All these options will address the need for additional capacity on the HxM path. Considering the relatively low cost, technical feasibility and short implementation timelines, the conductor

¹ Review of Ontario Interties-report prepared for the Minister of Energy by the IESO and OPA in 2014

² Ontario- Québec Interconnection Capability-report prepared for the Deputy Minister of Energy by the IESO in 2017

uprate option is the preferred solution for reinforcing the M30/31A circuits and increasing the capability of the HxM path.

With the increased M30/31A capability required for addressing the Ottawa area system needs, another major benefit that would be derived from the HxM path uprate is the capability to access capacity imports from Québec. The 2017 Québec interconnection study identified that 1250 -1650 MW³ of capacity imports from Québec would be enabled following the reinforcement of the M30/31A circuits. Having this non-domestic capacity to participate in Ontario's electricity markets will improve market competition resulting in lower costs for capacity overall. An additional source of capacity east of the GTA can also mitigate the impact of any transmission constraints in the GTA and enhance system resilience in the Ottawa area.

Project Scope and Targeted In-Service Date

This conductor uprating option and its related costs and timelines have been discussed with Hydro One. In consideration that a Class Environmental Assessment, a Leave to Construct approval and some intricate outage scheduling would be required, Hydro One has indicated that a target in-service date of December 2022 is feasible. The IESO supports targeting for this in-service date and will provide assistance, as required, to Hydro One in implementing this project.

If you have any questions, feel free to contact us.

Yours truly,



Bob Chow
Director, Transmission Planning
Independent Electricity System Operator (IESO)

cc: Farooq Qureshi, Hydro One Networks Inc.
Leonard Kula, IESO
Terry Young, IESO
IESO Records

³ The full capability of the HVDC tie at Outaouais is 1250 MW; the additional capacity indicated up to 400 MW would be supplied from other ties with Québec, such as with Beauharnois GS.

Appendix: System Map

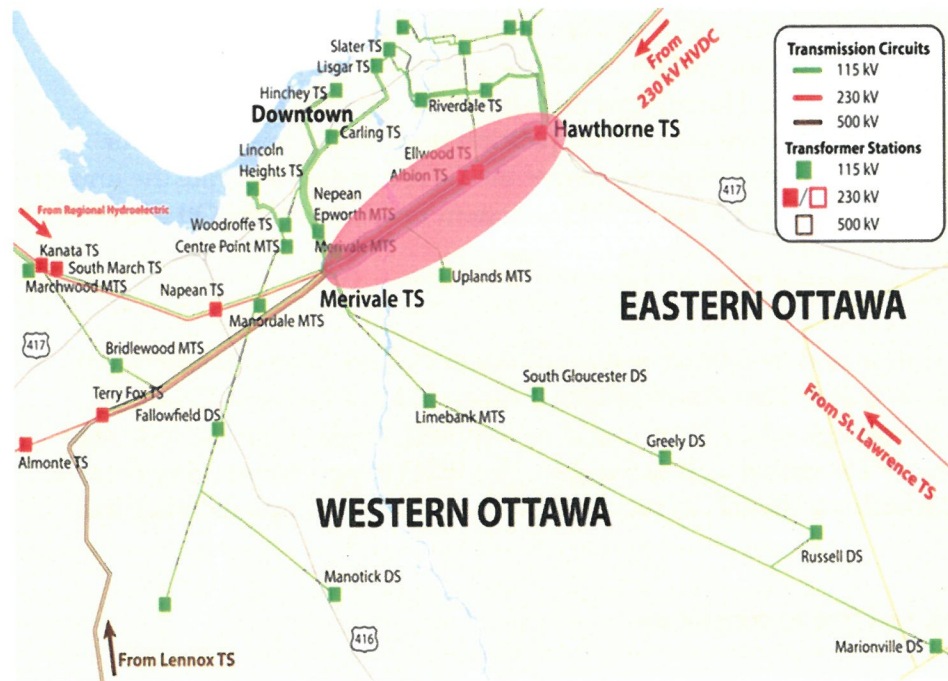


Figure 1 Hawthorne by Merivale Path