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# System Impact Assessment Addendum Report

Final Report - Public

CAA ID: 2021-704

Project: PUC Transmission LP – New Transmission Station

Connection Applicant: PUC (Transmission) LP

March 21, 2024



# Acknowledgement

The IESO wishes to acknowledge the assistance of Hydro One in completing this assessment.



# Disclaimers

## IESO

This report has been prepared solely for the purpose of assessing whether the connection applicant's proposed connection with the IESO-controlled grid would have an adverse impact on the reliability of the integrated power system and whether the IESO should issue a notice of conditional approval or disapproval of the proposed connection under Chapter 4, section 6 of the Market Rules.

Conditional approval of the project is based on information provided to the IESO by the connection applicant and Hydro One at the time the assessment was carried out. The IESO assumes no responsibility for the accuracy or completeness of such information, including the results of studies carried out by Hydro One at the request of the IESO. Furthermore, the conditional approval is subject to further consideration due to changes to this information, or to additional information that may become available after the conditional approval has been granted.

If the connection applicant has engaged a consultant to perform connection assessment studies, the connection applicant acknowledges that the IESO will be relying on such studies in conducting its assessment and that the IESO assumes no responsibility for the accuracy or completeness of such studies including, without limitation, any changes to IESO base case models made by the consultant. The IESO reserves the right to repeat any or all connection studies performed by the consultant if necessary to meet IESO requirements.

Conditional approval of the proposed connection means that there are no significant reliability issues or concerns that would prevent connection of the proposed project to the IESO-controlled grid. However, the conditional approval does not ensure that a project will meet all connection requirements. In addition, further issues or concerns may be identified by the transmitter(s) during the detailed design phase that may require changes to equipment characteristics and/or configuration to ensure compliance with physical or equipment limitations, or with the Transmission System Code, before connection can be made.

This report has not been prepared for any other purpose and should not be used or relied upon by any person for another purpose. This report has been prepared solely for use by the connection applicant and the IESO in accordance with Chapter 4, section 6 of the Market Rules. This report does not in any way constitute an endorsement of the proposed connection for the purposes of obtaining a contract with the IESO for the procurement of supply, generation, demand response, demand management or ancillary services.

The IESO assumes no responsibility to any third party for any use, which it makes of this report. Any liability which the IESO may have to the connection applicant in respect of this report is governed by Chapter 1, section 13 of the Market Rules. In the event that the IESO provides a draft of this report to the connection applicant, the connection applicant must be aware that the IESO may revise drafts of this report at any time in its sole discretion without notice to the connection applicant. Although the IESO will use its best efforts to advise you of any such changes, it is the responsibility of the connection applicant to ensure that the most recent version of this report is being used.

The IESO provides no comment, representation or opinion, express or implied, with respect to who should bear the cost of IESO requirements for connection in this report and disclaims any liability in connection therewith.

The IESO assumes no responsibility or liability for the investigation, design, development or implementation of any solution for the purpose of meeting any requirement contained in this report, regardless of whether the solution is included in this report as a "Potential Solution", and including for any part of the investigation, design, development or implementation of such solution that occurred prior to the date of this report.

## Hydro One

The results reported in this report are based on the information available to Hydro One, at the time of the study, suitable for a System Impact Assessment of this connection proposal.

The short circuit and thermal loading levels have been computed based on the information available at the time of the study. These levels may be higher or lower if the connection information changes as a result of, but not limited to, subsequent design modifications or when more accurate test measurement data is available.

This study does not assess the short circuit or thermal loading impact of the proposed facilities on load and generation customers.

In this report, short circuit adequacy is assessed only for Hydro One circuit breakers. The short circuit results are only for the purpose of assessing the capabilities of existing Hydro One circuit breakers and identifying upgrades required to incorporate the proposed facilities. These results should not be used in the design and engineering of any new or existing facilities. The necessary data will be provided by Hydro One and discussed with any connection applicant upon request.

The ampacity ratings of Hydro One facilities are established based on assumptions used in Hydro One for power system planning studies. The actual ampacity ratings during operations may be determined in real-time and are based on actual system conditions, including ambient temperature, wind speed and facility loading, and may be higher or lower than those stated in this study.

The additional facilities or upgrades which are required to incorporate the proposed facilities have been identified to the extent permitted by a System Impact Assessment under the current IESO Connection Assessment and Approval process. Additional facility studies may be necessary to confirm constructability and the time required for construction. Further studies at more advanced stages of the project development may identify additional facilities that need to be provided or that require upgrading.



# Table of Contents

<b>Acknowledgement</b>	<b>1</b>
<b>Disclaimers</b>	<b>2</b>
IESO	2
Hydro One	3
<b>Project Description</b>	<b>6</b>
<b>Notification of Conditional Approval</b>	<b>6</b>
<b>IESO Requirements for Connection</b>	<b>6</b>
Specific Requirements:	6
Requirements for the Connection Applicant	6

## Project Description

PUC (Transmission) LP (the “connection applicant” and “transmitter”) had proposed a new 230/115 kV transformer station (TS), namely Tagona West TS, in Sault Ste. Marie supplied by Third Line TS through two new 230 kV circuits. The new station would in turn supply Algoma Steel Inc.’s new electric arc furnace load facility (“EAF”, assessed under CAA 2021-694 and CAA 2021-695) through two new 115 kV circuits (the “project”).

The IESO issued the original SIA report and Notification of Conditional Approval on September 28, 2023. Subsequently, Algoma Steel Inc. changed the ramping rate specification of the EAF, reducing it to a maximum of 10 MW/s in both the ramp up and ramp down directions.

This addendum documents this change and replaces the connection applicant requirements for connection in the original SIA report.

The in-service date of this project is expected to be Q3 2025.

## Notification of Conditional Approval

This assessment concludes that the proposed connection of the project is expected to have no material adverse impact on the reliability of the integrated power system, provided that all requirements in this report and in the original SIA report are implemented. Therefore, the assessment supports the release of the Notification of Conditional Approval for connection of the project.

## IESO Requirements for Connection

### Specific Requirements:

#### Requirements for the Connection Applicant

- Requirement:** In accordance with Finding (2) in the original SIA report, the connection applicant shall install voltage control devices capable of providing 125 Mvar capacitive reactive compensation at the 230 kV bus of Tagona West TS to mitigate system voltage changes in excess of 2% as a result of EAF ramping. If the devices are not adequately controlled and coordinated with EAF ramping, an additional 195 Mvar of capacitive reactive compensation shall be installed to avoid reactive power range from getting utilized due to changing system conditions.

Requirement #1 may be satisfied by installing, at Tagona West TS, fast-acting dynamic reactive compensation device(s) (e.g. SVC, Statcom, etc.) or, if feasible, by installing a combination of locally placed fast-acting dynamic and mechanically switched reactive compensation devices. The solution shall remain stable and not trip for large and small disturbances under low short circuit conditions.

## **Potential Solution:**

A voltage control solution option that may meet this requirement is described below:

### Implementation:

- Install a new +/- 50 Mvar STATCOM at Tagona West 230 kV.
- Install 4 x 35 Mvar new capacitors at Tagona West 230 kV.
- Use existing 2 x 40 Mvar capacitors at EAF CTS.

### Control methodology:

- STATCOM controls the Tagona West 230 kV voltage, e.g. 242.5 kV, adjustable.
- Control system automatically controls the switching of the 6 shunt capacitors based on regulating the STATCOM output within a  $\pm 30$  Mvar dead band and a 2 second delay before capacitors switching.

The connection applicant may choose to pursue an alternative solution that satisfies Requirement #1. The functional description document of the final proposed solution, whether the above Potential Solution or an alternative, and its corresponding dynamic models, shall be submitted to the IESO to evaluate for approval, which the IESO may grant or reject at its sole and absolute discretion, at least twelve months before the in-service date of the project.

The connection applicant is required to perform the necessary electromagnetic transient (EMT) studies to confirm the adequacy of the design of the voltage control solution. The study results along with PSCAD study files must be shared with the IESO at least twelve months before the in-service date of the project.



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