



September 12, 2003

File OP-1600

Mr. Bob Singh,  
Manager, Connection & Distribution Development  
Investment Planning Division  
Hydro One  
483 Bay Street  
Toronto, Ontario, M5G 2P5

Dear Mr. Singh:

***London Clarke TS – Increase the Ampacity of Existing Transformers  
Notification of Approval of Connection Proposal  
CAA ID Number: 2003-145***

Thank you for the detailed information that you provided on the plan to bypass the Off Circuit Tap Changers for the two transformers at London Clarke TS.

We have reviewed the documentation submitted by you and concluded that the proposed modifications will not have a significant effect on the reliability of the IMO-controlled grid and will result in an increase in the London-Clarke station power transfer capability and the two-hour rating of the transformers.

This project was treated under the Expedited Connection Assessment process since a formal study is not warranted.

The relevant information and assessment is included in the attachment to this Notification of Approval.

The IMO is therefore pleased to grant approval to complete the proposed transformer modifications.

To complete the project, please follow the necessary procedures and obtain the required approvals, licences and permits as may be required by the OEB and other regulatory authorities.

Please note that the new facilities will also have to meet the requirements of the IMO's Facility Registration process before being placed in service.

For further information, please contact the undersigned.

Yours truly,

Bob Gibbons  
Manager - Long Term Forecasts & Assessments  
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cc: IMO Records

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All information submitted in this process will be used by the IMO solely in support of its obligations under the *Electricity Act, 1998*, the *Ontario Energy Board Act, 1998*, the *Market Rules* and associated policies, standards and procedures and in accordance with its licence. All information submitted will be assigned the appropriate confidentiality level upon receipt.

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## Attachment

### Connection Assessment Report

#### *London-Clarke TS – Increase Transformer Capabilities CAA ID 2003-EX145*

#### **Project Description**

Hydro One proposes to increase the capability of the two transformers at London-Clarke TS by raising the thermal limitation of the high voltage off-circuit tap changer.

London-Clarke TS is connected to the 230 kV double circuit line W36/W37 emanating from Buchanan TS. The transformers are rated 50/67/83 MVA and equipped with off-load tap changers that have been on the same tap position (tap 2) since 1972 when the transformers were installed. Presently, the 10-day and 2-hour capabilities of these transformers are limited by the 280 A ampacity limitation associated with the selector switch on tap 2. Hydro One proposed to bypass the selector switches on the two transformers and connect the external bushings directly to the internal lead on tap 2.

A comparison of the thermal capability of the transformers before and after the proposed modifications is given in the table below.

Summer Ratings (MVA)	Existing	New
Continuous	83 MVA	83 MVA
10-day (Station Capability)	115 MVA	118 MVA
2-hour	115 MVA	132 MVA

#### **Assessment**

##### *Thermal Loadings*

The 230 kV line W36/W37 provides radial supply to London-Clake TS and Talbot TS. The two stations have a total load capability of 293 MVA. Assuming that the individual station loads would not exceed the station's capability and taking into consideration transmission line losses it was determined that the peak power flows out of Buchanan on W36/W37 could reach about 308 MVA. This flow is well within the 629 MVA representing the summer continuous rating of one circuit.

##### *Voltage*

The IMO-controlled grid performance standards set by the Market Rules state that the system voltages could normally vary between 220 kV to 250 kV. All facilities connected to the IMO-controlled grid are expected to be able to operate under this voltage range.

Operating records of system voltages observed in the last year show that the Buchanan 230 kV voltage varied between 235.7 kV and 247.3 kV. Should the transformer tap positions at London-Clake TS remain unchanged the LV voltage could vary between 28 kV and 31.8 kV.

Hydro One indicated that since the transformers have been on the same tap position since 1972, it is not expected that future system conditions would change and warrant the need for moving the tap position.

### *Conclusions and Recommendations*

This assessment concluded that the proposed increase in station capability of 3 MVA:

- will not have an adverse impact on the reliability of the IMO-controlled grid,
- if fully utilized, will result in power flows well under the summer continuous capability of W36/W37 radial circuits.

The assessment also concluded that it is unlikely that the transformer tap positions will need to be changed in the foreseeable future.

It is thus recommended that notification of approval be granted for Hydro One' s proposal to bypass the limiting selector switches on the two 220/28 kV transformers at London-Clake TS.