CONNECTION ASSESSMENT & APPROVAL PROCESS

ASSESSMENT SUMMARY

Applicant: Hydro One Networks Inc.

Project: Beach TS - Install Surge Arresters on Step-down Transformer T4 & Auto-transformer T7

CAA ID No. 2003-EX154

Long Term Forecasts & Assessments Department
Consistent Information Set Department

Date: 29th August 2003

Station A Box 4474 Toronto ON M5W 4E5 Canada **tel** 905.855.6100 **fax** 905.855.6372 **www.theIMO.com**

ASSESSMENT SUMMARY

HYDRO ONE NETWORKS Inc.

BEACH TS - Step-down Transformer T4 & Auto-transformer T7
Replace Existing Rod Gaps with Surge Arresters

1.0 GENERAL DESCRIPTION

The 115kV terminals of the 115/13.8kV step-down transformer, T4, and the 230/115kV auto-transformer, T7, at Beach TS are presently equipped with 115kV rod gaps to protect them from the effects of lightning surges.

Hydro One, as part of their on-going program to address inadequate transformer protection, is proposing to replace these rod gaps with surge arresters. The 13.8kV tertiary winding of the T7 auto-transformer is also to be equipped with new surge arresters at the same time that the 115kV rod gaps are being replaced on this transformer.

The original 230kV rod gaps on the T7 auto-transformer at Beach TS have already been replaced with surge arresters.

This work is scheduled to be completed during 2004.

2.0 SPECIFICATIONS FOR THE NEW SURGE ARRESTERS

2.1 115kV Surge Arresters: Transformers T4 & T7

Number & Location:	Six phase-to-ground (one per phase) to be connected as close as practical to the 115kV terminals of the T4 and T7 transformers
Type:	Metal Oxide gapless - station class
Minimum MCOV:	80kV (rms)
Front-of-wave impulse protective level:	Maximum Equivalent Front-of wave not more then 440kV crest
Maximum discharge voltage for 8x20μsec at 10kA impulse current:	Not more than 385kV crest
Maximum switching surge protection level:	Not more than 300kV crest at 1kA
TOV capability :	The arrester is to be capable of withstanding a power frequency overvoltage of not less than 96kV rms for 0.5 sec after the rated energy absorption.
Max. energy dissipation per arrester:	As recommended in ANSI/IEEE C62.11 1993 standard for a single column arrester
Press relief capability:	As recommended by ANSI/IEEE C62.11 1993 standard & not less that 65kA

2.2 13.8kV Surge Arresters: Auto-transformer T7

Number & Location:	Three phase-to-ground (one per phase) to be connected as close as practical to the 13.8kV terminals of the T7 transformers
Type:	Metal Oxide gapless - station class
Minimum MCOV:	12kV (rms)
Front-of-wave impulse protective level:	Maximum Equivalent Front-of wave not more then 93kV crest
Maximum discharge voltage for 8x20μsec at 10kA impulse current:	Not more than 84kV crest
Maximum switching surge protection level:	Not more than 76kV crest at 500A
TOV capability :	The arrester is to be capable of withstanding a power frequency overvoltage of not less than 15kV rms for 10 sec after the rated energy absorption.
Max. energy dissipation per arrester:	As recommended in ANSI/IEEE C62.11 1993 standard for a single column arrester
Press relief capability:	As recommended by ANSI/IEEE C62.11 1993 standard & not less that 40kA

3.0 ASSESSMENT

The replacement of the 115kV rod gaps on transformers T4 & T7 with surge arresters, together with the installation of surge arresters on the 13.8kV terminals of the tertiary winding of auto-transformers T7, at Beach TS will be beneficial and will have no adverse impact on the IMO-controlled grid.

4.0 NOTIFICATION OF APPROVAL

It is therefore recommended that a Notification of Approval of the Connection Proposal be issued.