



CONNECTION ASSESSMENT & APPROVAL PROCESS

ASSESSMENT SUMMARY

Applicant: Hydro One Networks Inc.

*Project: Manby West TS - Install 230kV & 27.6kV Surge Arresters
on Step-down Transformers T3 & T4*

CAA ID No. 2003-EX153

***Long Term Forecasts & Assessments Department
Consistent Information Set Department***

Date: 28th August 2003

ASSESSMENT SUMMARY

HYDRO ONE NETWORKS Inc.

MANBY WEST TS - Step-down Transformers T3 & T4 Replace Existing 230kV Rod Gaps with Surge Arresters

1.0 GENERAL DESCRIPTION

The 230/27.6kV step-down transformers, T3 & T4, at Manby West TS are presently equipped with 230kV 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, and also to install new surge arresters on the 27.6kV terminals of these transformers.

This work is scheduled to be completed during 2004.

2.0 SPECIFICATIONS FOR THE NEW SURGE ARRESTERS

2.1 230kV Surge Arresters

Number & Location:	Six phase-to-ground (one per phase) to be connected as close as practical to the 230kV terminals of the T4 and T5 transformers
Type:	Metal Oxide gapless - station class
Minimum MCOV:	150kV (rms)
Front-of-wave impulse protective level:	Maximum Equivalent Front-of wave not more than 710kV crest
Maximum discharge voltage for 8x20µsec at 10kA impulse current:	Not more than 620kV crest
Maximum switching surge protection level:	Not more than 380kV crest at 1kA
TOV capability :	The arrester is to be capable of withstanding a power frequency overvoltage of not less than 180kV rms for 0.5sec 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 than 65kA

2.2 27.6kV Surge Arresters

Number & Location:	Six phase-to-ground (one per phase) to be connected as close as practical to the 27.6kV terminals of the T4 and T5 transformers
Type:	Metal Oxide gapless - station class
Minimum MCOV:	24kV (rms)
Front-of-wave impulse protective level:	Maximum Equivalent Front-of wave not more than 127kV crest
Maximum discharge voltage for 8x20µsec at 10kA impulse current:	Not more than 115kV crest
Maximum switching surge protection level:	Not more than 100kV crest at 500A
TOV capability :	The arrester is to be capable of withstanding a power frequency overvoltage of not less than 30kV rms for 10sec 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 than 40kA

3.0 ASSESSMENT

The replacement of the rod gaps with 230kV surge arresters together with the installation of surge arresters on the 27.6kV terminals of step-down transformers T3 & T4 at Manby West 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.