



NEWFOUNDLAND AND LABRADOR
BOARD OF COMMISSIONERS OF PUBLIC UTILITIES
120 Torbay Road, P.O. Box 21040, St. John's, Newfoundland and Labrador, Canada, A1A 5B2

E-mail: gyoung@nlh.nl.ca

2013-02-04

Mr. Geoffrey Young
Senior Legal Counsel
Newfoundland and Labrador Hydro
P.O. Box 12400
St. John's, NL A1B 4K7

Dear Mr. Young:

Re: Follow-up Information - Newfoundland and Labrador Hydro's (Hydro) 2013 Capital Budget Application

This is further to your letter of January 7, 2013 wherein Hydro advised that certain projects from the 2013 Capital Budget would be removed. The Board requires further information concerning the project titled Rewind Generator Units 1 and 2. With respect to the information requested the following references are provided:

Re: Pages B-5 and B-6 of Newfoundland and Labrador Hydro's 2012 Capital Budget Application:

"The life expectancy for Micapal, multi-turn coil insulated stator windings is approximately 35 years.

Unit 1 and Unit 2 stator windings have reached the end of their useful service lives and have been recommended for replacement in several instances. In 2003 and 2005, GE Energy Services recommended replacement windings of Unit 1 and Unit 2 respectively and AMEC, in 2010 as part of the Holyrood plant condition assessment, used an independent generator expert to recommend the replacement of Unit 1 and Unit 2.

As part of the anticipated mode of operation of the Holyrood plant from a generating station to a synchronous condenser facility in 2020, this project aligns itself with that plan as the windings will be required as a generating station and a synchronous condenser facility."

Re: Volume I, Report 2 of the 2012 Capital Budget Application, Unit 1 and Unit 2 Generator Rewind, dated July 2011, page 19:

"This proposal is justified to maintain system reliability by replacing the Unit 1 and Unit 2 generator stator windings before a failure occurs. The most appropriate timing would see the Unit 1 stator winding replaced in 2015 and the Unit 2 stator winding at next generator outage in 2014. Should a winding fail while in service, it could cause significant damage to the stator core and the generating unit, thus, impairing Hydro's

ability to provide cost effective power and reliable electrical service to the Island Interconnected System. The emergency replacement time on such equipment could potentially be up to eighteen months.

The life expectancy for Micapal insulated stator windings is approximately 35 years. However, this number varies based on such operating conditions as temperature, number of starts and stops, maintenance and care and unit loading. The windings of Units 1 and 2, and especially Unit 1, have reached the end of their useful service lives, supporting the fact that winding replacements are required.

Two independent condition assessments of the stator windings were completed in 2003 and 2005 by GE Services. GE assessed Unit 1 in 2003 and Unit 2 in 2005. The 2003 report stated "...I recommend to plan a full generator stator rewind..." while the 2005 report stated "It is therefore recommended that stator be rewound in the near future."

During 2010, the independent AMEC assessment, reviewed the historical test and maintenance data and industry experience and confirmed the GE findings and stated "...there is no doubt that the windings have deteriorated extensively in service. All test results show the right phase is in very weak condition. It has operated for a further 7 years to date, without a failure, but further deterioration can be expected, ...it is considered appropriate to proceed with the installation of a new stator winding..." The AMEC report considered the mode of operation for the Holyrood Generating Station in its assessment recommendations.

Taking the above recommendations into consideration, the Unit 1 and Unit 2 stator windings have an increased likelihood of failure over the next three years. Hydro has upgraded some of the generator protection systems, but some of the critical temperature monitoring instrumentation is inoperative and repair is not feasible, as these measuring devices are embedded in the stator winding. If a failure was to occur with the current protection in place, the possible damage to the stator core and rotor that could occur would result in possibly costs in the \$13 to \$20 million range. The generator protection is intended to prevent or reduce damage to the stator core and rotor when a failure occurs by eliminating the fault condition from the system, but with the age and deteriorated state of Unit 1 and Unit 2 the risk of stator damage is high. In order to prevent unnecessary damage to this generating unit and the potential system impacts of a long operational downtime during the winter peak period, the stator windings of Units 1 and Unit 2 must be replaced. The timing of the stator rewind will be reviewed once bids and delivery schedule are received following the tendering process to determine if an earlier rewind would be possible."

Re: In Request for Information P2-CA-NLH-1, Hydro was asked:

"Please provide the justification for proceeding with this project at this time given AMEC's "Recommended Actions" found at page 8-6 of the Holyrood Thermal Generating Station Condition Assessment & Life Extension Study."

Hydro responded:

- "1. These tests will be performed on Unit 1 as recommended during its steam turbine and generator overhaul major outage, scheduled for 2012. The testing will be conducted to confirm the anticipated continued degradation of the stator winding condition.

2. *Although outside the scope of the stator rewind project, this testing will be conducted on Unit 1 during the scheduled 2012 major outage as well.*
3. *The testing on Unit 1 stator in 2012 will provide up to date data to allow for a further estimation of the remaining life of the stator windings. Given that the delivery time, once ordered, on a stator winding is approximately 18 months (and given the criticality of all three Holyrood units producing during the winter for the Island Interconnected System) the earliest that a stator rewind for Unit 1 could proceed on a planned basis is spring of 2014. If it is determined that the condition of the Unit 1 stator windings are such that it must be done as soon as possible then Unit 1 will likely be moved to 2014, instead of Unit 2 as presently planned."*

Further to the above noted references, please provide the following:

1. Please confirm that Hydro is cancelling and not deferring this project.
2. Please provide the information that has led Hydro to this decision in light of the evidence provided for the original justification. In the response please provide details of what was ascertained during the major overhaul of this unit during 2010 as it relates to the rewind of the stator windings.
3. How will the system reliability be affected by the removal of this project?

If you have any questions please contact the Board's Legal Counsel, Ms. Jacqui Glynn or the undersigned.

Yours truly,



Cheryl Blundon
Board Secretary

/cpj