

NOVA SCOTIA UTILITY AND REVIEW BOARD**IN THE MATTER OF: THE PUBLIC UTILITIES ACT**

- and -

**IN THE MATTER OF: AN APPLICATION by Nova Scotia Power Incorporated ("NSPI")
for Approval of Unforeseen and Unbudgeted ("U&U") Work Order
Greater Than \$1 Million:**

CI# 40425 - Kempt Road Transformer (P-510 / Matter No. 03715)

INFORMATION REQUESTS (2nd Set)

To: Ms. Lee Thomson-Lutz, MBA, CMA
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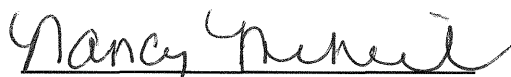
From: Board Staff
Nova Scotia Utility and Review Board

Responses Due: Tuesday, March 8, 2011

Copies: 3 and an electronic copy (pdf searchable)

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Issued at Halifax, Nova Scotia, this 21st day of February, 2011.



Nancy McNeil, Regulatory Affairs Officer/Clerk

IR-15:

On page 4 of 20 of the submission it is stated that the two recent transformer failures occurred on July 5, 2009, and September 4, 2010. According to page 4 of 5 of the CI# 39723 submission, 104-T63 Transformer Refurbishment, this unit suffered damage during a storm in February of 2010. Please clarify.

IR-16:

With reference to the response to IR-3 (b), it is stated that a transformer was taken from another location and placed in-service at Kempt Road:

- a) Where was this transformer taken from?
- b) What is the rating of this transformer?
- c) Where will this transformer be transferred to after the second Kempt Road Substation transformer is rewound and returned to service?
- d) Please provide a copy of the Kempt Road Substation single line diagram, with the proposed fourth transformer installed.
- e) Please provide details of all locations where NSPI currently has "energized spares". Include substation configurations, transformer ratings, and installation dates.
- f) Please provide a copy of NSPI's planning criteria justifying the use of energized spares.

IR-17:

With reference to the response to IR-4:

- a) As it relates to the hypothetical loss of all three transformers at the Kempt Road Substation, how much of the stated 54 MVA could not be transferred to the Armdale and Water Street substations? Please specify separately amounts that are limited due to feeder capacity and amounts that are limited due to the substation transformers themselves.
- b) Please provide copies of the Armdale and Water Street substation single line diagrams.
- c) What is the maximum capacity of the mobile transformer used in this example?
- d) What spares are generally available, other than the 28/37/47 MVA unit located at Onslow?

IR-18:

With reference to the response to IR-5:

- a) When were the investigations noted in IR-5 (a) completed?
- b) When did NSPI start to use the procedure described in IR-5 (b)?
- c) Please describe any measures taken to limit the magnitude of fault current.
- d) Describe any possible options that have not been implemented and explain the reasons.

IR-19:

With reference to the response to IR-6:

- a) Describe any test results regarding the integrity of this third transformer.
- b) On page 4 of 20 of the submission NSPI states: "The remaining unit has been exposed to similar conditions and is therefore at risk for failure." Please elaborate on the levels of risk for failure of this unit, before and after the implementation of the procedure described in the response to IR-5 (b).
- c) Based on investigations of the two faulted transformers, what steps can be taken to reinforce the integrity of the third transformer to enhance its ability to withstand these through faults?
- d) Please estimate the cost of such enhancements and compare that with the cost of a new transformer.

IR-20:

With reference to the response to IR-7:

- a) What is the remaining life expectancy of the two transformers that were or will be rewound and refurbished?
- b) It is noted that 104H-T61 was rewound in 2010. Please elaborate on this project and provide the date when the Board approved this capital item.
- c) Please provide the history of 104H-T63 which appears to have been rewound in 2001 and in 2010. Include in your response its ratings, locations, and also explain the 2001 rewind.

IR-21:

With reference to the response to IR-8:

- a) It is noted that the life expectancy of transformers being used at the Kempt Road Substation is "less than 45 years". Please quantify the quoted phrase.
- b) Please provide any scientific or statistical analysis which can support "45 years" and "less than 45 years".

IR-22:

With reference to the response to IR-10:

- a) NSPI states that the winding configuration of the spare transformer located in Onslow is such that it cannot be paralleled with the existing units without taking an outage. Please further explain the above statement, including the required outage duration.
- b) In addition to the two mobile transformers referenced in the response, does NSPI plan to acquire an additional mobile transformer? If so, when is the new mobile expected to be available, and what is its rating?

IR-23:

With reference to the response to IR-11, please explain why a spare transformer available for the Kempt Road Substation, as noted in the response to IR-10, is not a lower cost option than purchasing a new transformer?

IR-24:

With reference to the response to IR-12, please provide a copy of the analysis (review) mentioned in the response, as well as copies of any updated studies.

IR-25:

With reference to the response to IR-13, please identify this external company and explain any affiliation with NSPI.

IR-26:

With reference to the response to IR-14:

- a) Please explain why 5 additional circuits are needed to provide sufficient transfer capability for the Kempt Road Substation load.
- b) Provide a copy of NSPI's long range planning study for the Halifax Peninsula and clearly identify the next step required to supply increased load growth.

IR-27:

Please explain, using transformer 104H-T62 as an example, how NSPI determines an optimum replacement age for a substation transformer.

IR-28:

Please provide and discuss assumed transformers' failure rates, and probabilistic risk assessments of the reliability of power supply to customers in the downtown Halifax area, for the following transformer configurations at the Kempt Road Substation:

- a) Before the noted transformer failure on July 5, 2009 occurred;
- b) Between July 5, 2009, and the noted transformer failure on September 4, 2010;
- c) Between September 4, 2010, and the return in service of 104H-T63 in November of 2010;
- d) Between the return in service of 104H-T63 in November of 2010, and the return in service of 104H-T61;
- e) With both transformers, 104H-T63 and 104H-T61 returned to service, and 104H-T62 in operation;
- f) As configuration in e), but with the proposed spare transformer 104H-T64 in place.

Please take into consideration information provided in the response to IR-5 (b).

1 **IR-29:**
2 Please provide risk assessments and an economic analysis of two alternatives, to purchase the
3 proposed transformer now, and to delay the purchase for a number of years, based on an
4 acceptable level of risk. If a delay in the purchase of the proposed transformer is not an
5 acceptable option, please summarize NSPI's justification for the urgent purchase of this
6 transformer.