NOVA SCOTIA POWER
An Emera Company

November 22, 2010

Ms. Nancy McNeil
Regulatory Affairs Officer/Clerk
Nova Scotia Utility and Review Board
3rd Floor, 1601 Lower Water Street
P.O. Box 1692, Unit "M"
Halifax, NS B3J 3S3

Re: CI 38819 – 51V Tremont Circuit Breaker & Bus - Responses to Information Requests (IRs) P-128.10

Dear Ms. McNeil:

Enclosed are the IR responses pertaining to the capital item referenced above. These IRs were received on November 8, 2010.

The substation single line diagram provided in IR-2 Attachment 1 is confidential due to system security concerns. Protection of the power system preserves reliability and reduces the risks associated with external threats.

The contractor names and their related cost information provided in IR-6 is confidential. NSPI strives to keep the suppliers' pricing confidential from their other customers or potential competitors. This prevents competitors from using their information to gain a competitive advantage. This is equally true for NSPI, which desires to protect its ability to acquire capital services and equipment on the most competitive terms. Those "best" prices may not be available if there is a risk that they will be disclosed to the customers or competitors of the supplier.

Since NSPI customer rates are cost-based, the maintenance of confidentiality for this item is to the direct benefit of customers.

NSPI discloses this information to the Board and to Intervenors who have no conflicting interest, in confidence, thereby ensuring that an appropriate prudence review can occur.

Regards,

Lee Thomson-Lutz, MBA, CMA
Manager, Capital

Encl.

NON-CONFIDENTIAL

Request IR-1:

Reference the capital approval sheet

(a) The reference to CI#33525 on page 2 shows a capital cost of $9,148,573, but the present requested approval amount for this work order is $8,016,435. Please explain.

(b) Under "why do this project" on page 5, it states that loss of selected elements causes the voltage on the 69 KV system to drop below acceptable levels. What are acceptable levels? Please provide a copy of the appropriate NSPI design criteria document.

(c) Under "why do this project now" on page 5, it states that low voltages could occur during the 2010/2011 peak load. However, the project in-service date is December 2011. This means the project will not be available for the 2010/2011 peak.

(i) Is the above statement correct?

(ii) If so, then NSPI is in violation of its system design criteria for the 2010/2011 peak period? If not, please explain why not.

(iii) Why wasn't this project put forward earlier in order to meet this winter's peak period?

Response IR-1:

(a) The amount of $9,148,573 represents the budget estimate for CI 33525 in early 2010, prior to submission for Board approval. Following more detailed scoping, this amount was revised to $8,016,435. This revised amount was not updated on page 2 of the capital approval submission for CI 38819. This was an oversight by NSPI.

(b) NSPI's design criteria specify acceptable voltage levels are not less than 90 percent and not greater than 110 percent. In addition a bus shall not experience a voltage change greater than 10 percent from pre-fault to post-fault condition.

Please refer to Attachment 1 for a copy of the NSPI Design Criteria.

(c) (i) Yes. Low voltages could occur during contingency situations during the 2010/2011 peak load period.

(ii) By not having the project in-service for the 2010/2011 peak period, should a contingency occur, there is risk that the criteria will be violated.

(iii) The risk of criteria violation for 2010/2011 is low.

DEFINITIONS

1. **Normal system conditions** are defined to include all of the following:
    a. Expected load conditions.
    b. All transmission facilities in service (no line or transformer maintenance).
    c. Economically scheduled and dispatched generation allowing for planned generator maintenance outages (non-firm generation is not included as economically dispatched generation).
    d. Stable steady-state operation of the Interconnected Transmission System.
    e. All system voltages within 95% to 105% of nominal, unless otherwise noted.
    f. All system elements operating within their continuous thermal ratings, unless otherwise noted.
2. A **system element** is defined to be any one generator, transmission line, transformer or bus section.
3. **Breaker back-up** is defined to be protection against a local breaker's failure (mechanical or electrical) to trip when initiated by an associated protection operation.
4. **Single contingency** is defined as loss of one **system element** with or without a fault.

3. ELECTRICALLY REMOTE TRANSMISSION SYSTEM

This category is defined by the buses at which the ultimate fault levels will not exceed 1,500 MVA three-phase.

1. The Interconnected Transmission System dynamic response shall be stable and positively-damped following a fault on any one **system element.**

2. From **normal system conditions** following any **single contingency** with or without a fault, all system elements shall be within their thermally limited ratings in the steady state.

3. From **normal system conditions**, for any **single contingency** with or without a fault, steady-state post-contingency system bus voltages shall not be less than 90% and not be greater than 110% of nominal following correction by automatic tap-changers. In addition, no bus shall experience a voltage change from pre-fault to post-fault condition greater than 10% before movement of tap changers.

4. As far as possible, provision should be made to ensure that no fault is left permanently on the system.

5. **Breaker back-up** will be applied to Electrically Remote Transmission if system studies determine the requirement.

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Request IR-2:

Please provide a copy of the Tremont substation single line diagram as it presently exists and one that shows the configuration when this project is complete. Indicate clearly the changes resulting from this work order.

Response IR-2:

The changes to electrical configuration at Tremont consist of the following:

a) The creation of a 4 breaker 138kV ring bus (expandable to 6 breaker)

b) The addition of the new 138kV line terminal (L-6015 from Canaan Road)

c) The addition of the 2nd 138-69kV auto transformer

d) The creation of a split 69kV bus between the 2 auto transformers

e) The removal of the existing 69kV wood-pole structured substation and relocating the 3-69kV line exits into the main substation yard.

Please refer to Confidential Attachment 1 for the substation single line diagram as it presently exists and one that shows the configuration when this project is complete.

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Request IR-3:

Reference Response to ACE Plan IR-T2, Attachment 1, page 2 of 35

(a) This page provides transformer ratings as 30/40/50/56 MVA. Please provide details on what the operating assumptions are for each rating, e.g. assumed ambient temperature.

(b) What rating is used to compute the overload condition referred to on page 3 of 35?

Response IR-3:

(a) The 30 MVA rating is the self-cooled 55 degree Celsius rating of the transformer. The 40 MVA rating is the 55 degree Celsius rating of the transformer with some fans operating. The 50 MVA rating of the transformer is the 55 degree Celsius rating of the transformer with all fans operating. The 56 MVA rating of the transformer is the maximum rating at 65 degrees Celsius with all fans operating. For planning purposes, ambient temperatures are not considered. The transformer is considered to be operating in the summer or winter under the following ratings:

- Summer: Rated at 100 percent of the 65 degree Celsius manufacturer rating.

- Winter: Rated at 110 percent of the 65 degree Celsius manufacturer rating.

(b) The rating that is used to compute the overload condition is the contingency situation that results in the transformer being rated at 120 percent of the 65 degree Celsius manufacturer nameplate MVA.

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Request IR-4:

Reference Response to ACE Plan IR-T2, Attachment 1, page 3 of 35

(a) For the 2010 peak period, with the loss of the Canaan Road to Tremont 138 KV circuit, the two 138/69 KV transformers at Canaan Road are overloaded. What is the MVA rating of these transformers and what is the percentage overload?

Response IR-4:

(a) The rating of one transformer is 30/40/50/56 MVA and the other transformer is rated 33.6/44.8/56 MVA. In essence, both units are considered to be rated 56 MVA. The percentage overload is the contingency situation at 120 percent of the 65 degree Celsius manufacturer nameplate MVA.

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Request IR-5:

Reference Response to ACE Plan IR-T2, Attachment 1, page 4 of 35

(a) NSPI proposes to establish a 138 KV ring bus? What is the incremental cost to establish a ring bus?

(b) Please describe more fully the reasons for establishing a ring bus at this time, including any impact on customer reliability.

(c) NSPI proposes to reconfigure the 69 KV bus. What is the incremental capital cost of this work?

(d) Please describe more fully the reasons for reconfiguring the 69 KV bus at this time, including any impact on customer reliability.

(e) Please provide more details on the alternative transmission route examined, e.g. from where to where?

(f) Would this alternate route provide better, the same or lower reliability to the area? Was this factored into the decision on which alternative to recommend? If not, why not?

Response IR-5:

(a) NSPI proposes to establish a 138kV ring bus at Tremont. The alternative was to establish a split bus with tie breaker. Either configuration requires the same number of circuit breakers and line terminals so there is no incremental cost to establish the ring bus.

Response IR-5: (cont'd)

(b) The ring bus design requires more space but provides greater flexibility and improved system reliability. In the ring bus configuration, breakers may be taken out of service for maintenance while keeping the transmission line and transformer elements in service. This configuration provides a more secure supply for customers during system contingency situations.

(c) The 69kV bus is being replaced because the existing 69kV bus does not have space to create a node on which to connect the new 138kV-69kV transformer. In addition, the existing 69kV substation structures are deteriorated and require rebuilding. Although the 69kV bus will be rebuilt, the 69kV bus one line configuration will remain the same as present with the exception of the additional 138kV to 69kV transformer node. There is no incremental cost associated with the configuration.

(d) Please refer to part (c). The additional 138kV-69kV transformer supply will provide a more secure source to the 69kV system and will alleviate the contingency overload condition.

(e) The alternate route is between an existing Bridgewater 138 kV substation and the Tremont 138 kV substation. It is approximately 20 km longer than the selected route.

(f) This route would effectively provide the same level of reliability to the area. Since there is no appreciable reliability benefit and the alternate route was longer and more costly, it was decided to proceed with the route between Canaan Road and Tremont.

REDACTED

Request IR-6:

Reference Response to ACE Plan IR-T2, part c

(a) Table 1 shows tender close dates of July 2010 for three of the tender documents. Please provide an update on the status of these tenders. Include in your response any impact the actual tender price may have on the capital cost of the three work orders submitted.

Response IR-6:

The following is the status of the 3 tenders in question.

1) Site Development & Foundations – Canaan Rd.: The tender close date was September 10, 2010. The contract has been awarded to [redacted], but the associated work has yet to start. The value of this contract is [redacted], which is comparable to the original cost estimate for the work.

2) Site Development & Foundations - Tremont: The tender close date was November 1, 2010. There were 2 bids received for this work. The proposals are still being evaluated and a contract will be awarded by the end of November. The pricing proposals are comparable to the original estimate for the work.

3) Electrical Substation Construction – Tremont: This tender has not been issued. NSPI now plans to complete this work.

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Request IR-7:

Reference Response to ACE Plan IR-T2, part d

(a) Is the Gantt chart provided in the response to IR-T2 still reasonably accurate? Please provide comments on any major changes and, in particular, comment on the in-service date.

Response IR-7:

(a) The in-service date of December, 2011 for the overall project is still on track as per the referenced Gantt chart. The in-service date for Canaan Road will extend into Q1, 2011 and the 138kV portion for Tremont will extend into Q3, 2011.

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Request IR-8:

Reference the capital approval sheet, capital cost accounts

Please provide detailed support for the estimate shown under Account 028, Consulting. Include in your response a description of the items being designed.

Response IR-8:

The following descriptions contribute to the consulting estimate:

1) Transformer pre-tank inspection and witnessing of factory tests at the manufacturing facility in Taiwan (estimate: $40,000).

2) Physical layout design, equipment specifications, protection and control electrical design and the overall project management over the duration of the job (estimate: $275,000).