

Public Service Company of New Hampshire
Docket No. DE 10-261

Data Request TC-04

Dated: 12/16/2011

Q-TC-005

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Exhibit No. TransCanada #3

Witness Panel 6

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Witness: Terrance J. Large
Request from: TransCanada

Question:

With respect to Mr. Large's testimony dated October 26, 2011 on Page 20, lines 10-21 and Page 21, lines 1-9,

- i) please provide a detailed description of Mr. Large's experience, qualifications, and schooling that validate his expertise to provide his opinion that "because Newington is an intermediate to peaking resource, the proper technique to factor in uncertainty and determine value over a future time horizon is the real option value approach";
- ii) please list any studies or analyses using "the real option value approach" either personally performed or managed by Mr. Large;
- iii) please explain why "the real option value approach" could not be used to determine future value over a time horizon of a base load resource;
- iv) please explain why "the real option value approach" was not used by NU/PSNH "to factor in uncertainty and determine value over a future time horizon" of the Northern Pass Transmission project;
- v) please explain whether in Mr. Large's opinion "the real option value approach" would ordinarily consider retirement as one of the possible "options" in such an analysis;
- vi) please provide the actual net energy benefits realized by Newington in the first eleven months of 2011, and compare the results to the analysis used to determine the ES rate and the Levitan "real option value approach";
- vii) please identify all reasons, given the assumptions used in the study, that the GE MAPS model runs used for the NU Northern Pass Transmission study could not be used to value Newington Station as a stand-alone entity.

Response:

- i) Mr. Large has had experience in running production cost simulation models in his prior work with the New York State Department of Public Service and has received post-graduate education in Probability and Statistics from the Georgia Institute of Technology. Additionally, Mr Large has personal experience in Power Generation Operations including serving as Engineering Supervisor at Middletown (CT) Generating Station where three units were operated as intermediate to peaking resources during his tenure. One of the units referenced was designed and operated in a manner very similarly to Newington Unit 1.
- ii) Mr. Large personally oversaw the Newington Station Continued Unit Operation study performed by PSNH's consultant, Levitan & Associates, Inc. This study used the real option value approach.
- iii) The real option value approach *can* be used to determine the value of a baseload resource. However, for a single fuel baseload resource that has a positive gross margin even when its fuel cost is high and energy prices are low, there is no extra dispatch flexibility option value or fuel-switching option value when applying the real option value approach. While the real option valuation approach yields a more accurate valuation for a resource that optionally shuts down or switches fuels, depending on market conditions, it does not produce a more accurate valuation for a single fuel baseload resource from the standpoint of dispatch flexibility or fuel-switching flexibility.
- iv) The NPT project will receive energy from very low variable dispatch cost hydro resources in Quebec, but their energy has high opportunity costs for delivery to either Ontario or New York using other transmission lines. Hence, a more thorough NPT energy benefits analysis could have been conducted using a real option valuation approach to simulate the allocation of energy among three market locations.

A real option valuation analysis would use correlated stochastic scenarios for Ontario, NYISO, and ISO-NE energy prices. In addition, there is some timing real option value in the scheduling of the limited amount of hydro energy between months or over the hours within each month.

v) Retirement decisions at multiple future dates can be modeled with the real option approach. But for the CUO study, the only retirement decision date is at the start of the study period, so there is no real option value from the flexibility to defer the retirement decision to one or more later dates when additional information is known about the benefits and costs of continued operation from those dates.

(vi) PSNH objects to the request to the extent it seeks information on net energy benefits in 2011. PSNH's Least Cost Integrated Resource Plan, which was submitted to the Commission on September 30, 2010, was premised on the Company's operations as of the date the Plan was completed. As a result, the request for information on net energy benefits realized by Newington in 2011 is not reasonably calculated to lead to the discovery of information that would be admissible in this proceeding. Notwithstanding this objection, PSNH offers the following response.

Excluding real time dispatch that appears to have been mainly for operating reserves, PSNH estimates Newington's energy margin using offer prices for all of 2011 to be \$4.0 million. Using accounting record fuel expense and including days where the dispatch appears to have been mainly for operating reserves would produce a different value. Fuel accounting is done on a monthly not daily or hourly basis and includes #2 fuel oil not directly used for dispatch. While it might be possible to refine the accounting record using daily gas billing information and possibly daily fuel use information, that information is not readily available whereas the offer prices are. Offer prices on gas do not necessarily reflect actual gas costs because the gas is purchased only after Newington is provided dispatch instructions which is subsequent to the Newington offers being submitted.

The final ES rate filing model submitted in December 2010 for 2011 estimated Newington's energy margin to be \$0.7 million.

vii) Key limitations of the CRA study for valuation of Newington Station are:

- Forecasted fuel prices, based on the 2010 EIA Annual Energy Outlook, were higher than the more recent market forward prices used in the CUO study.
- Did not simulate stochastic daily fuel prices for natural gas, RFO, and 2FO
- Did not simulate stochastic hourly energy prices
- Did not simulate both day-ahead and real-time market dispatch