The Narragansett Electric Company

d/b/a National Grid (Interstate Reliability Project)

RIPUC Dkt. No. 4360

Rebuttal Testimony of

David M. Campilii, P.E.

February 7, 2013

Q. Please state your full name and business address.

A. My name is David M. Campilii. My business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

Q. Have you previously filed testimony in this matter?

A. Yes, I filed prefiled testimony in this docket on November 21, 2012.

Q. What is the purpose of your rebuttal testimony?

A. The primary purpose of my testimony is to respond to the testimony of Gregory L. Booth, filed on January 17, 2013, on behalf of the Rhode Island Division of Public Utilities and Carriers.

Q. Do you disagree with Mr. Booth's overall conclusion?

A. No. Similar to Mr. Booth, I support the Interstate Reliability Project ("IRP") as described in Section 4 of the ER and do not recommend the Underground Alternative which is described in Section 5.8 of the ER. This testimony is intended to clarify some of the issues raised by Mr. Booth regarding the cost estimate for the Underground Alternative.

Q. How is your testimony organized?

A. I will be referring to Mr. Booth's testimony and addressing issues with the underground estimate in the order that they are raised in his testimony.

Q. Please discuss interference with other utilities as it relates to the underground cost estimates.

A. On page 13, starting on line 8, Mr. Booth discusses the presence of other utilities which could affect the installed depth of the underground transmission line alternative. National Grid concurs that this is a potentially significant factor, and we have included some costs

for over-excavation and trench shoring in the estimate. At this point, the route which has been selected is "representative" and has had limited underground utility investigation. Significant portions of the representative route are on rural roads which appear to have limited underground infrastructure, judging by the lack of visible manhole covers, gate boxes, etc. Other portions of the representative route appear to have more significant underground utilities in place. If the underground transmission line alternative were to be pursued for this project, a more detailed assessment of underground utilities would be performed as part of the final route selection process.

Q. Please discuss the quantity of rock excavation included in the estimate.

A. On page 16, line 4 and on page 30, line 20, Mr. Booth states that the quantity of rock removal may be underestimated. Given the limited amount of subsurface investigation performed at this stage, the amount of rock to be encountered is somewhat speculative. National Grid would concur with Mr. Booth that rock removal can have a significant effect on the duct bank installation cost. If an underground alternative were to be pursued, an early engineering activity would be to perform geotechnical investigation along potential routes to characterize the quantity of rock removal that would be required.

Q. Please discuss the underground to overhead cost ratio comparisons and the apparent inconsistencies that Mr. Booth refers to on pages 15-16 and 29-31 of his testimony.

A: Mr. Booth has performed several cost per mile and cost ratio calculations for the overhead and underground line cost estimates. He has noted different costs per mile and different UG/OH cost ratios for the 366 line (Millbury Switching Station to West Farnum Substation), the 341 line (West Farnum Substation to Lake Road Substation), and for the

underground 1 mile dip. We would offer the following clarifications and comments to the costs per mile and cost ratio calculations.

From the National Grid cost estimates in Table 5-16, Mr. Booth has calculated a cost for the 366 line of $4.6 million per mile for overhead construction and $20.2 million per mile for underground construction, with an UG/OH cost ratio of 4.4. Mr. Booth has further calculated a cost per mile for the 341 line of $4.6 million per mile for overhead construction and $23 million per mile for underground construction, with an UG/OH cost ratio of 6.5. We would concur that Mr. Booth has accurately apportioned the National Grid cost estimates on a per mile basis and has calculated the cost ratio correctly for the 366 line. However, I believe that Mr. Booth has made a mathematical error in the OH/UG cost ratio for the 341 line. Using the referenced National Grid cost estimates, this ratio is 5.0 and not the 6.5 Mr. Booth quotes.

The difference in the underground cost per mile between the 366 line and the 341 line is partially based on the route features encountered between the two routes. However, the primary difference is due to a somewhat higher cost per mile for the Connecticut portion of the 341 Line. NU has estimated approximately $29 million per mile for the Connecticut portion of the 341 line UG alternative. This higher NU cost per mile raises the overall cost per mile for the 341 underground alternative as compared to the underground 366 line estimate. The estimates for the National Grid portion of the routes utilize consistent assumptions between the 366 line, the 341 line, and the generic dip.

Mr. Booth has also questioned the consistency of the “underground dip” costs for both the cable costs and the transition station costs. The underground cable estimates in all

cases include the cable terminations as part of the cable estimate, and not as part of the transition station cost. For the 366 line and the 341 line, these termination costs are spread over many miles, whereas for the dip, the cable termination costs are spread over 1 mile. This will result in a somewhat higher cost per mile for the short dip. This cost difference is best compared to the 366 line cost per mile (to avoid the NU costs per mile which are included in the 341 line estimates). The transition station costs for the 1 mile dip reflect much lower shunt reactor costs than for the longer 341 and 366 circuits, which explains the lower transition station costs for the 1 mile dip.

Q. Please discuss volatility in the material markets as it pertains to the underground transmission cable estimate.

A. On page 16, starting on line 22, Mr. Booth states that volatility in the price of oil can have a significant effect on cable material costs. National Grid concurs with this. At the time that the estimates were prepared, the price of oil and costs for copper and lead (major constituents of underground transmission cable) were near historic highs. National Grid had requested estimating quotations at that time to reflect the effect of the higher materials costs on the cable costs. These costs were used in preparing the estimate. Mr. Booth is correct in stating that true cable costs may not be known until the project was awarded.

Q. Do you agree with Mr. Booth's suggestion on pages 17 and 29-30 that National Grid should use a -25% to +100% in underground estimates?

A. National Grid concurs that underground transmission has a higher level of unknowns and cost uncertainty at this level of engineering investigation. National Grid is already

demonstrating significantly higher estimated costs and significant operational issues with the underground alternative as compared to the proposed Project. If the larger tolerance suggested by Mr. Booth is applied to the underground alternative estimates, the difference in cost between the Project and the Underground Alternative becomes potentially much greater.

Q. What is your overall assessment of Mr. Booth's testimony regarding underground transmission costs?

A. Mr. Booth does make some valid points with regard to the higher levels of uncertainty of underground transmission construction as compared to overhead line construction. Depending on how the upside and downside risks actually aligned on this project, the underground costs could be higher than National Grid's estimate, or lower than Mr. Booth's estimate. In either case, the costs of the underground transmission alternative are significantly higher than the proposed Project.

Q. Do you have any other comments regarding Mr. Booth's testimony?

A. Yes. I would concur with Mr. Booth's conclusion on page 40 of his testimony that the Project is needed and, as proposed, "it represents the best and most cost-effective solution for achieving the needed system improvements to sustain a reliable transmission system with the capability of transporting competitively priced power into the region, while also providing an integrated transmission solution for the New England-West Solution."

Q. Does this conclude your testimony?

A. Yes it does.