



**Northeast
Utilities System**

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June 24, 2004

Ms. Pamela B. Katz
Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Docket No. 272 - Middletown-Norwalk 345kV Transmission Line

Dear Ms. Katz:

This letter provides the response to requests for the information listed below.

While it is not possible to provide all the information requested at this time, the Company is attaching the information which has been completed.

Response to CSC-03 Interrogatories dated 06/07/2004
CSC - 065

Very truly yours,


Anne B. Bartosewicz
Project Director - Transmission Business

ABB/dd
cc: Service List

Witness: Allen W. Scarfone
Request from: Connecticut Siting Council

Question:

In the "Connecticut Cable Transient and Harmonic Study for Middletown to Norwalk Project East Devon-Beseck 40-mile Cable Option (M/N-P1)", dated November 2003, conducted by GE Power Systems Energy Consulting, and submitted by the Applicant, there is a statement:

Attempts to avoid the 2nd harmonic resonance by adding 2nd harmonic filters would not be practical.
(Executive Summary, Page ES 2)

Please explain why the addition of the 2nd harmonic filters would not be practical.

Response:

As stated in data request TOWNS-01 Q-TOWNS-004, part a: "Harmonic filters at each substation (within SWCT and even for some substations beyond SWCT) could be added to address this situation. Second harmonic filters are generally expensive and large installations. Sizing of these filters must incorporate the energy that may come from other equipment on the system as well as the transformers where you are attempting to install filters. This can happen from other transformers inrushing at the same time. Quite often this is the cause for failure of 2nd harmonic filters. Therefore, multiple filter bank installations may be required, even at remote locations away from the Middletown to Norwalk Project."

Harmonic filters can be an effective method to shunt a specific source of harmonic distortion. Harmonic filters tuned to 120 Hz (second harmonic) can mitigate high voltage at the point of second harmonic current injection. All harmonic filters cause resonance to be shifted to other nearby frequencies, where a second harmonic filter will result in a system resonance below the second harmonic. While a second harmonic filter could potentially mitigate stimulus caused by injections of current at the discrete harmonic frequency (e.g., second harmonic injected by an offset-saturated transformer), the filter does not eliminate transient behavior caused by stimulus of the resonances by abrupt system events. As additional resonances are created, the system response becomes increasingly complex and difficult to analyze. While General Electric did not model the characteristics of a second harmonic filter in its studies and the resulting system response, there is concern that such a filter may not mitigate overvoltage issues, and might possibly aggravate the problem.

SERVICE LIST

Docket: 272

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