

January 5, 2016

**VIA E-MAIL AND HAND DELIVERY**

Attorney Melanie Bachman  
Acting Executive Director  
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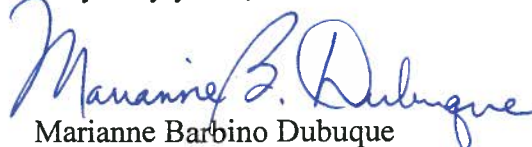
Re: **DOCKET NO. 461** - Eversource Energy Application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a 115-kilovolt (kV) bulk substation located at 290 Railroad Avenue, Greenwich, Connecticut, and two 115-kV underground transmission circuits extending approximately 2.3 miles between the proposed substation and the existing Cos Cob Substation, Greenwich, Connecticut, and related substation improvements.

Dear Attorney Bachman:

In connection with the above-referenced Docket No. 461, enclosed please find an original plus fifteen (15) copies of the following documents:

1. Third Supplemental Direct Testimony – Testimony of Kenneth B. Bowes;
2. Objection to the Office of Consumer Counsel’s December 21, 2015 Motion; and
3. Motion to Exclude Cross-Examination of Applicant on Issues of Real Property Ownership.

Very truly yours,

  
Marianne Barbino Dubuque

MBD/mkw  
Enclosures

cc: Service List dated October 2, 2015 attached (with enclosures)

{W2628132}

**LIST OF PARTIES AND INTERVENORS**  
**SERVICE LIST**

Status Granted	Document Service	Status Holder (name, address & phone number)	Representative (name, address & phone number)
<b>Applicant</b>	<input checked="" type="checkbox"/> E-Mail	Eversource Energy	<p>Jacqueline Gardell Project Manager Eversource Energy 56 Prospect Street Hartford, CT 06103 <a href="mailto:jacqueline.gardell@eversource.com">jacqueline.gardell@eversource.com</a></p> <p>John Morissette Project Manager-Transmission Siting-CT Eversource Energy 56 Prospect Street Hartford, CT 06103 <a href="mailto:john.morissette@eversource.com">john.morissette@eversource.com</a></p> <p>Jeffery Cochran, Esq. Senior Counsel, Legal Department Eversource Energy 107 Selden Street Berlin, CT 06037 <a href="mailto:jeffery.cochran@eversource.com">jeffery.cochran@eversource.com</a></p> <p>Marianne Barbino Dubuque Carmody Torrance Sandak &amp; Hennessey LLP 50 Leavenworth Street Waterbury, CT 06702 <a href="mailto:mdubuque@carmodylaw.com">mdubuque@carmodylaw.com</a></p>
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<b>Intervenor Approved on October 1, 2015</b>	<input checked="" type="checkbox"/> E-Mail	Meg Glass 9 Bolling Place Greenwich, CT 06830 <a href="mailto:glass50@hotmail.com">glass50@hotmail.com</a>	

**STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL**

Eversource Energy Application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a 115-kilovolt (kV) bulk substation located at 290 Railroad Avenue, Greenwich, Connecticut, and two 115-kV underground transmission circuits extending approximately 2.3 miles between the proposed substation and the existing Cos Cob Substation, Greenwich, Connecticut, and related substation improvements.	DOCKET NO. 461  January 5, 2016
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**THIRD SUPPLEMENTAL DIRECT TESTIMONY  
TESTIMONY OF KENNETH B. BOWES**

**Q. What is the purpose of this supplemental testimony?**

A. The purpose of this supplemental testimony is to provide additional background information on the analysis conducted by Eversource concerning the replacement of existing transformers with larger transformers at Cos Cob Substation.

**Q. Please summarize the analysis conducted by Eversource concerning the replacement of existing transformers with larger transformers at Cos Cob Substation.**

A. In the course of Eversource's comprehensive evaluation of alternatives to the proposed Project, Eversource considered removing the existing transformers at Cos Cob Substation and replacing them with larger transformers (36/48/60 MVA or 48/64/80 MVA). However, as noted in its response to interrogatory OCC- Set IV- 056 (See Eversource Exhibit 35), Eversource could not replace the existing transformers with larger transformers because there is insufficient space to accommodate the larger transformers at Cos Cob Substation.

**Q. Please provide the underlying factors that led Eversource to conclude that installing larger transformers at Cos Cob Substation was not a feasible option.**

A. Eversource's evaluation was based on the following:

- Replacement transformers would be 115- to 27.6-kV, 48/64/80 MVA.
- Replacement transformers would be purchased per Eversource's standard specification for substation transformers that supply distribution customer load. This includes a requirement that the transformer include voltage regulating equipment ("tap changer operable under load") to allow proper regulation of customer voltage. The existing transformers have the required voltage regulating equipment and any future replacements would need to have the required voltage regulating equipment as well.
- The installation of the replacement transformers would meet Eversource standards for clearances between equipment.
- The installation of the replacement transformers would require sufficient space around each transformer to permit rigging onto the foundation, assembly, maintenance, and future removal/replacement of the transformer without the need to remove adjacent equipment from service.
- Eversource has existing 48/64/80 MVA transformers on its system, and used the as-built drawings for those transformers to evaluate space requirements at Cos Cob Substation for direct replacement of the existing 115- to 27.6-kV transformers. In addition, the as-built

drawings for existing 36/48/60 MVA transformers on Eversource's system were used to evaluate space requirements. Although 36/48/60 MVA transformers were determined to be insufficient to meet the load requirements, they were evaluated for use as an interim measure.

Based on the above considerations, Eversource concluded that larger transformers (36/48/60 MVA or 48/64/80 MVA) could not be installed in accordance with Eversource standards due to space limitations at Cos Cob Substation.

**Q. Please explain why voltage regulating equipment (tap changer operable under load) would be necessary.**

A. For the proper functioning of the equipment at Cos Cob Substation, any replacement transformers at Cos Cob Substation would require voltage regulating equipment (tap changer operable under load); otherwise, Eversource would not be able to maintain proper voltage for the downtown network or for its customers that are supplied at 27.6-kV.

**Q. Are there any other considerations if the transformers were to be replaced at Cos Cob Substation?**

A. Yes. As noted in Section E.4.1.1 of the Application (See Eversource Exhibit 1), Cos Cob Substation is the cornerstone of the electrical distribution system supplying electric service to Greenwich customers. Cos Cob Substation performs critical functions, including acting as an electrical "off-ramp," taking power at 115 kV from the transmission system (the highway system of lines that move high voltage power over long distances) and reducing the transmission voltage levels down to distribution voltage levels, in this case 27.6 and 13.2 kV, which levels are reduced further to serve homes and businesses; supplying power at 27.6 kV to other substations in Greenwich to enable those substations to serve homes and businesses; and

supplying power at 27.6 kV to large commercial customers and the secondary network in downtown Greenwich.

**Q. Does the proposed Project provide system-wide benefits that could not be achieved by using larger transformers even if such an option were feasible?**

A. As noted in Eversource's Supplemental Testimony of November 24, 2015 (See Eversource Exhibit 32), the proposed Project addresses the need for capacity to avoid transformer overloads at Cos Cob Substation, eliminates potential distribution feeder overloads supplying power to Prospect Substation from Cos Cob Substation and addresses the need for capacity to reduce the risk of transformer overloads at Prospect Substation. Use of larger transformers at Cos Cob Substation would address at most only the issue of transformer overloads at Cos Cob Substation and would not address the risk of potential distribution feeder overloads or potential overloads at Prospect Substation.

**Q. Based on your education, training and experience with the proper functioning of the Eversource electric service at the distribution level, is it your opinion that the use of larger transformers at Cos Cob Substation is not feasible and also that use of larger transformers at Cos Cob Substation (presuming feasibility) would not provide the reliability benefits that the proposed Project would provide to Eversource's customers in Greenwich?**

A. Yes.

**Q. Does this conclude your testimony?**

A. Yes