



**POWERGEM**

Power Grid Engineering & Markets

# **East Winchendon Solar Generation** **Interconnection Study**

Prepared for

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### **Purpose of Study**

A study was completed to determine the thermal or voltage network impacts for a 20 MW solar generation project interconnected into the National Grid East Winchendon 13.8 kV substation.

### **System Model and Analysis Description**

The ISO-NE 2020 summer peak load flow model and associated contingency files were used for this study. Various generation dispatch scenarios were evaluated to provide results for a range of system conditions.

For all studies, Exhibit 1 shows the queued generation in NH, VT and MA with a completed Impact Study that were added to the ISO-NE summer peak model.

Queue #	Point of Interconnection	Size (MW)	Fuel
527	Milford Power 115 kV	30	Natural Gas
535	WMECo 23 kV line 19J1	5	Wind
543	PSNH 115 kV line L163	28	Wind
565	Coolidge 115 kV	20	Sun
581/582	Harrington Street 69 kV	6	Sun
592	Bear Swamp 230 kV	66	Water
602	Moore 230 kV	5	Water
617	Waters River 115 kV	62	Natural Gas
622	Putnam 115 kV	43	Natural Gas

Exhibit 1

Monitoring of voltages was confined to the immediate transmission vicinity (local area within approximately 4 substations) of the East Winchendon 115 kV substation. The voltage limits used for the study area were a low voltage limit of 0.95 PU and a high voltage limit of 1.05 PU.

Thermal limits were evaluated for any facility in ISO-NE where the study generator had a  $\geq 3\%$  DFAX ( $\geq 0.6$  MW) impact on the monitored facility. The normal rating (Rate A) was used for non-contingency conditions and the emergency rating (Rate B) was used for post-contingency conditions.

ISO-NE requires an overlapping interconnection impacts test for capacity resources to qualify for the Forward Capacity Auction (FCA). In PowerGEM's experience, the ISO-NE overlapping interconnection impacts test is extremely difficult to duplicate. Therefore, PowerGEM applies a different algorithm to approximate when overlapping interconnection impacts are likely to occur. This pseudo overlapping interconnection impact test was completed for the study generator.

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## **Summary of Results**

### **Base 2020 Summer Peak Model with Exhibit 1 Queued Generation**

A study was completed for a 20 MW solar generator interconnected to the East Winchendon 13.8 kV substation. The queued generation projects in Exhibit 1 were added to the model. The results of the study follow:

- No voltage problems were identified.
- No thermal problems were identified.
- No capacity (overlapping interconnection impact) limits were identified.

### **Base 2020 Summer Peak Model with Brayton and Pilgrim Generation Retirements**

A study was completed for a 20 MW solar generator interconnected to the East Winchendon 13.8 kV substation. The queued generation projects in Exhibit 1 were added to the model and the Pilgrim nuclear and Brayton generation was modeled as retired. The results of the study follow:

- No voltage problems were identified.
- No thermal problems were identified.
- No capacity (overlapping interconnection impact) limits were identified.

### **Base 2020 Summer Peak Model with Retirements and Low Boston Generation**

A study was completed for a 20 MW solar generator interconnected to the East Winchendon 13.8 kV substation. The queued generation projects in Exhibit 1 were added to the model and the Pilgrim nuclear and Brayton generation was modeled as retired. Also, to model a low Boston generation scenario, Kendall generation was reduced by 240 MW and Mystic generation was reduced by 615 MW. The results of the study follow:

- No voltage problems were identified.
- No thermal problems were identified.
- No capacity (overlapping interconnection impact) limits were identified.

