UI
An Avangrid company

Non-Wires Solutions Program

Grid Needs Filing Narrative Document

February 6, 2026

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I. Document Background

This Grid Needs Filing Narrative Document serves as a supplement to Appendix 6 Grid Needs Filing of the NWS annual filing package. This document is intended to provide greater detail in an effort to increase the Public Utility Regulatory Authority and their Process Monitor's awareness of project solutions alternatives and the solution selection process per project contained in the Grid Needs Filing.

II. Grid Needs Filings Projects Narratives

1. UI Regional Career High School Microgrid - Energy Storage Resiliency - New Haven

Project ID#: PRJ-003790	**Estimated Start Year (Construction):** 2027
Regulatory Category: Resiliency, Modernization	**Estimated In Service Year (Energized):** 2027
Project Cost: $4,689,808	

a. Project Description

CT. Public Act 22-55 was approved by the CT. General Assembly in May of 2022. This act allowed PURA to direct each EDC to submit no more than 3 proposals for pilot projects to build, own, and operate Battery Energy Storage Systems (BESS) in their service territories. This New Haven BEES Microgrid project was approved in PURA Docket Number 22-06-05 PURA Implementation of Public Act 22-55.

Hill Regional Career High School is located at 140 Legion Ave. New Haven, Connecticut within the UI operations territory. The building is served by New Haven circuit 1526 (13.8 kV) via a branch of the circuit approx. 1.2 miles from the Water St. Substation. The circuit serves approximately 1,949 customers with a peak load of 8.56 MW (Summer). The building is served by a 3-phase, 750kVA pad-mount transformer at a voltage of 277/480 Vac. The facility hosts a 143kW rooftop solar array and a 75kW natural gas-powered combined heat and power generation unit.

The facility is designated as a critical facility on New Haven circuit 1526 and serves as an emergency shelter for the community during a natural disaster or prolonged electrical outage. This facility's primary non-emergency use is as a magnet high school that also provides many community support functions. The facility has been designated as a top 10 tier 1 priority for

electrical restoration after an outage and is located within a DOE Disadvantaged Community (DAC).[1]

b. System Needs and Justification

Since January 2015, circuit 1526 has experienced 56 unexpected outages resulting in 7,441 unique customer-outage events (the average outage affected 127 customers). The average unexpected outage duration was 4.7 hours. A very high percentage of unexpected outages (82%) had a duration of four hours or less.

Of the historical unexpected outages on New Haven Circuit 1526 since 2015, zero were caused by faults that occurred at the critical service pole. Therefore, the critical facility could avoid 100% of historical unexpected outages if electrically isolated as part of an islanding scheme.

c. Proposed Scope of Work

Installation of a 2.5 MW, 7.0 MWh battery mid-circuit on circuit 1526 to provide outage mitigation to emergency shelter (Hill Regional HS) and adjacent circuit branch serving Environmental Justice Community (EJC) and DAC customers as approved in DN 22-06-05.
This battery storage project consists of installing a 2.5 MW, 7.0 MWh Battery Energy Storage System (BESS) mid-circuit on circuit 1526 in New Haven, Connecticut. The battery will be used to provide circuit resiliency and capacity benefits. Specific use cases for this project include:

1. Resiliency and back up to a targeted section of a poor performing circuit
2. Provides back-up to Low to Moderate Income (LMI) and EJC
3. Provides targeted relief during ISO-NE capacity events
4. Provides load relief to an overloaded circuit

d. Solution Alternatives Considered

Alternative 1:

The first equivalent alternative considered was a traditional resiliency poles & wires solution which consists of a dual-feed solution that provides backup power from a neighboring circuit utilizing a Vista switch. It also includes converting a section of the circuit to aerial cable and adding an electronic recloser to better isolate the critical facility from outages on the downstream circuit. The total cost of the traditional poles and wires solution is estimated to be $1,687,970.

Alternative 2:

The second equivalent alternative solution considered was a natural gas generator to provide outage back-up capabilities to the three critical facilities. The total estimated capital cost of a natural gas generator is $1,010,000 with annual recurring OPEX costs of $10,000 for fuel and maintenance, with a total lifetime cost (15 years) of $1,200,000.

e. Risk of No Action

The primary risk to this project is budget overruns due to rising BESS implementation costs, high internal costs associated to overheads and the relative complexity involved in the installation, commissioning and operation of a microgrid. Within its decision (DN 22-06-05) approving the

[1] https://www.energy.gov/diversity/justice40-initiative

microgrid, PURA required all approved BESS microgrid projects to pass certain benefit-cost analysis (BCA) hurdles throughout the major milestones of the project development and execution. The next major milestone will be the release and evaluation of an RFP (anticipated early 2026) which will require a revised BCA conducted based upon actual costs. If the BCA value falls below a 1.0, the scope of the project needs to be revised, or the project needs to be cancelled outright. Budgetary risk mitigation includes strict adherence to internal budgets, timelines and milestones through a robust project management strategy, a comprehensive RFP process to help mitigate additional risk contingencies built into pricing. Secondary risks are associated with the siting of the BESS microgrid itself. The BESS will be designed to be installed on public property, in close proximity to a public high school and residential community and is subject to the full zoning and siting process with the City of New Haven and the State of Connecticut. Mitigating these risks has involved extensive and continuous outreach, including close collaboration with city and state officials, building owners, residents, and local community groups to foster understanding and secure support for the benefits this project brings to the community.

f. Project Benefits

Energy storage will be required to meet the State's clean energy goals enabling the integration of renewable intermittent resources like solar and wind. This project addresses an existing operational resiliency need and utilizes existing connected intermittent resources to optimize battery charging and discharging cycles. This project also helps Connecticut move towards its goal of 1 GW of energy storage by 2030.

g. Project Relationships (if applicable)

Not applicable.