

Integrated Approach to a Freeport Municipal Microgrid



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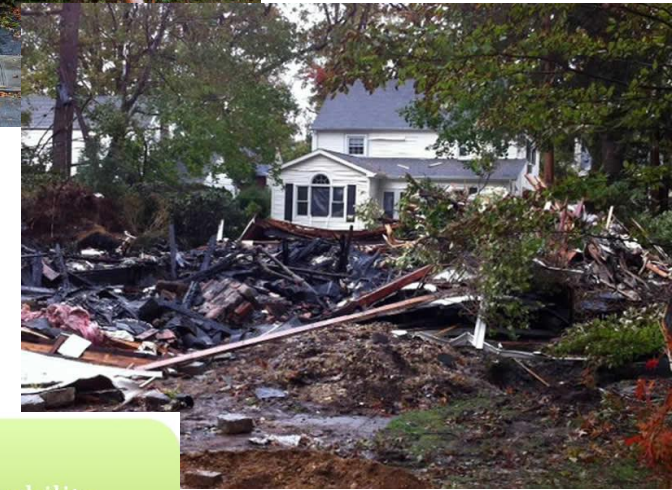
Background

- ▶ Village of Freeport owns and operates the electric grid for the town of Freeport with over 75 MW of onsite generation.
- ▶ Post Superstorm Sandy, Village of Freeport considered reinforcing their existing electrical infrastructure
- ▶ Project considers creating two grids – Village grid and public safety microgrid.
- ▶ Peak load of the Village is 58 MW and minimum load of 18 MW.



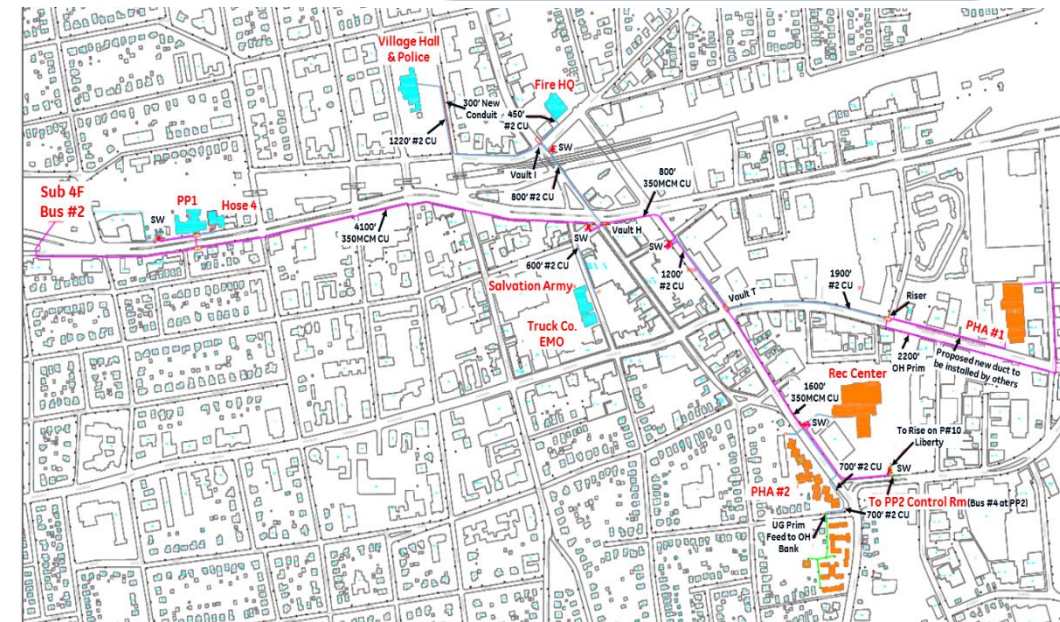
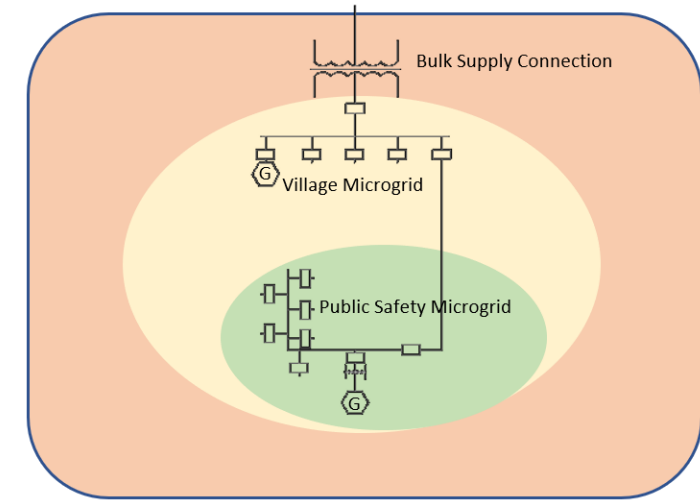
Drivers for Microgrid

- ▶ Grid vulnerability and reliability concerns
- ▶ Revised flood maps after Superstorm Sandy
- ▶ Public safety and uninterruptable core services
- ▶ Improved utilization of existing assets
- ▶ Greater energy autonomy
- ▶ Utility and governmental programs and incentives



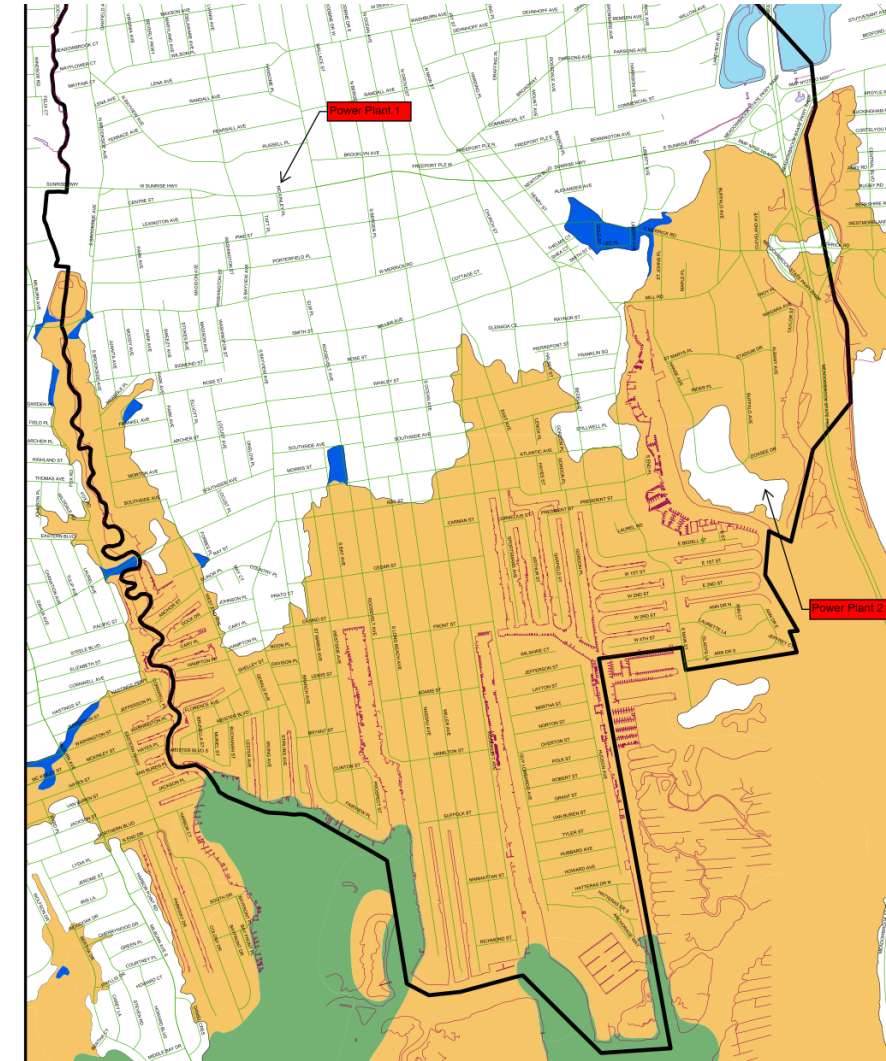
Development

- ▶ Public Safety Microgrid to include:
 - ▶ Police Station & Village Hall
 - ▶ Water Supply 1 and 2
 - ▶ Recreation Center (Emergency Shelter)
 - ▶ Emergency Management Office
 - ▶ Fire Department
 - ▶ Public Housing
- ▶ Total Public Safety Microgrid load of ~1,900 kW
- ▶ Total of ~ 2.5 miles circuit with 55% underground and rest above ground



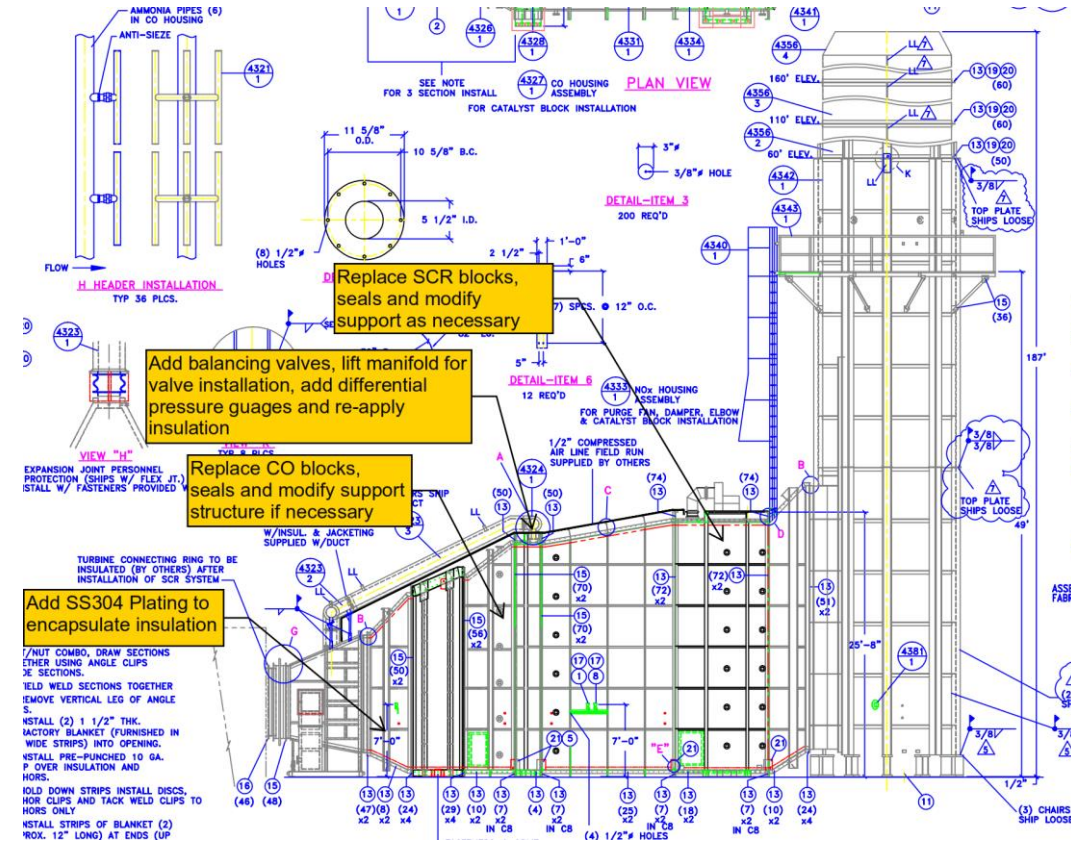
Improving Resiliency

- ▶ Public Safety Microgrid provides following functionality:
 - ▶ Black start capable
 - ▶ Designed for block loading
 - ▶ Provide black start power to Village microgrid
 - ▶ Power the public safety microgrid and run in parallel or independent of the Village Microgrid
 - ▶ Load following along with load management



Improving Resiliency

- ▶ Upgrade to the existing Village Microgrid
 - ▶ Upgrade controls to allow for the existing generating assets to participate in Village Microgrid.
 - ▶ Upgrade emission controls to maximize the output of existing assets
 - ▶ Upgrade to improve the start-up time for existing gensets
 - ▶ Central microgrid controller to manage the assets and town loads
- ▶ Multiple fuels – Natural Gas and #2 Oil



Improving Operation Economics

- ▶ Increased revenue by \$519,000
 - ▶ Existing plant revenue of \$3.3M increased to \$3.9M with participation in NYSIO market
 - ▶ Increased capacity of existing assets by 5 MW with improved emission controls.
- ▶ Incorporated additional generation of 3 MW and additional revenue of \$270,000.

Points to Ponder

- ▶ Low cost of electricity make it difficult to justify DER – Solar, CHP etc
- ▶ Additional revenue generated goes back to the rate payers making it complex to pay for the improvements
- ▶ Lack of mechanism to value reliability and resiliency – Maybe create Microgrid energy credits.
- ▶ No thermal hosts nearby making it cost prohibitive to create thermal sink
- ▶ Since these are peaking plants, the operations are limited to day time only
- ▶ Expensive and complex development process – Needs funding for feasibility study, design and development

Thank You

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