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CampusEnergy2016 | The Changing Landscape

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Topic/Goals

EPA NESHAP and NSPS Compliance Requirements for Emergency and Non-Emergency Distributed Generation Assets

AGENDA

- What is Demand Response?
- How does Distributed Generation enable Demand Response?
- How do EPA Regulations affect Distributed Generation assets?
  - Existing Installations
  - New Installations
- Case Studies

What is Demand Response?

- Typically, the supply and demand on the electric grid is balanced at the utility/power plant level by increasing electrical supply. However, there are circumstances where the supply cannot meet the demand in the traditional sense

- Demand Response is ***reducing*** demand at the customer level to alleviate capacity issues on the grid (called ***Capacity*** programs) –
  - **CAN BE EMERGENCY OR NON-EMERGENCY PROGRAMS**
    - Customer can use ***Load Management*** (ex: reducing lighting levels with BAS)
    - Customer can also use ***Distributed Generation*** (ex: diesel generation behind the meter) to offset their load

- Utilities and System Operators often provide incentives for customers to participate in Demand Response programs, allowing them to invest in infrastructure to handle the required operations

3

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What is Demand Response?

- Another type of Demand Response is called ***Peak Shaving*** or ***Peak Load Management***

- Depending upon the rate structures behind a given utility, the customer may be billed on what's termed a ***Coincident Peak (CP)***. This CP is the customer's load measured when the entire grid is at it's highest capacity in a given time period (monthly, annually, or other given period)

- Customers who can predict when these CP measurements will be taken can reduce their load or switch to generation to decrease the CP charge on their bill

4

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Distributed Generation As An Investment

Regulated Markets

- Traditional “Peak Shaving”
  - Coincident Peak (CP) Rate Structures
  - Generation Rider/Offset Credits
    - Ranges from $0 - $200+/kW annual benefit

Deregulated Markets

- Traditional “Demand Response”
  - Capacity and Frequency Programs
  - Emergency and Non-Emergency Programs
- Load Management
  - 4CP/5CP Management
- Price Response
  - Realtime Market Response
  - Strike Price

5

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EPA Regulations and Distributed Generation

NESHAP (40 CFR Part 63)

- June 12, 2006 and older
  - Requires engines participating in NON-EMERGENCY programs to bring engines to base emissions level by May 2013
    - Oxidation Catalyst
    - Continuous Parameter Monitoring System
    - Crankcase Filter
    - Maintenance Records
    - ULSD

NSPS (40 CFR Part 60)

- June 12, 2006 and newer
  - Requires diesel engines participating in NON-EMERGENCY programs to meet manufactured year Tier ratings for non-emergency purposes
    - 2006-2010: Tier 2
    - 2011-2014: Tier 4i
    - 2015 - ???: Tier 4F
  - Requires natural gas engines to meet manufactured year “EPA Certified” ratings for non-emergency purposes

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Recent Changes in EPA Regulations

DC Circuit Court of Appeals Ruling

- May, 2015

  - As part of NESHAP/NSPS guidelines, the EPA had created an exception to federal air permit requirements for engines participating in “Emergency Demand Response” (EDR) Programs, typically designated as EEA Level II Emergency Programs.

  - The exception allowed Emergency Designated engines to run up to 100 hours per year for these EDR programs.

  - A DC Circuit Court of Appeals Ruled against the EPA exception, allowing a stay until May 1, 2016 for the change to take effect. The ruling is still not finalized.

  - If the ruling holds, all engines must meet Federal non-emergency designations to run for any kind of Demand Response program.

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York Hospital Case Study

- York Hospital (7.5MW) - PJM
  - Traditional Approach
    - Facility required expansion, renovation, and replacement to meet the growing needs of their emergency power infrastructure.
    - Initial design/approach focused on 4.5MW of Tier 2 (emergency only) generation to serve their emergency needs only.
  - Generation As An Investment Approach
    - Facility investigated meeting capacity needs of entire facility with Tier 4 generation, enabling them to participate in Demand Response to drive revenue
    - For a 15% price increase, facility received 66% more generation (7.5MW) to backup their entire facility and enroll 5.8MW into PJM's Emergency Demand Response program
    - Simple payback on Tier 4 vs. Tier 2 premium was 3 years through Demand Response revenues, and facility received value of backing up entire facility

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Cold Storage Case Study

- Cold Storage Facility, MD - PJM
- Traditional Demand Response Approach
  - Customer was building new facility, required backup generation for their operations
  - Initial design/approach focused on Tier 4 generation owned by the customer, participating in Demand Response
- Generation As An Investment Approach – 3rd Party
  - Facility began to experience capital constraints due to the immense building project
  - Demand Response provider offered to own the backup generation system for small reliability adder on power contract
  - Demand Response provider retains revenues from operation of the system, and facility offloads capital requirements, risk, and operational responsibility of the generation system while still maintaining emergency standby capabilities

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NESHAP Case Studies

Multiple Municipalities, NC

- Rule Change
  - Generation owners were made aware of NESHAP requirements in 2010, and would no longer be able to run their generation for peak shaving. The value of peak shaving was roughly $120/kW annually.
  - Each generation owner evaluated the cost of a NESHAP retrofit (~$50/kW), determining the immense value of peak shaving outweighed the short term capital cost.

New Demand Response Opportunities

- Countless facilities have existing generation onsite used for emergency standby only.
- Regardless of how small the Demand Response benefits, many customers have moved forward on retrofitting emissions on their engines to meet NESHAP requirements to enable Demand Response participation.

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Summary

- By understanding the emissions and technical requirements for non-emergency generator operation (both existing engines and new installations), facilities can turn a traditional sunk cost into a long term investment.

Questions?

11