

Storming Ahead: FERC and State Efforts to Enhance Reliability and Resiliency

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Panelists

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- Research and consulting firm specializing in energy, economic, and environmental topics
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Agenda

- Finding Clues in Recent FERC Orders
- New Jersey Resiliency Response Post-Major Events

Overview

- FERC response to DOE NOPR request
- AD 18-7: Reliability and Resiliency
- June 29 FERC Order for PJM Interconnection
- July 2 FERC Order for ISO New England
- Possible FERC signals

DOE NOPR filing on Resiliency

- September 29, DOE requests the FERC to approve an emergency rule to retain resources needed for electric grid resilience.
- The FERC receives hundreds of filings over a two-month period from stakeholders concerned about what resilience means in terms of electric grid reliability.
- Range of proposals that include immediate FERC actions, technical conferences, and limited RTO by RTO solutions.

FERC disposition of DOE request

- On January 8, the FERC terminated proceedings in RM18-1 saying that a definition of resiliency in regard to electric grid reliability needed to be developed and that it had no record on which to approve the DOE requested rule.
- In the order terminating RM18-1, the FERC opened docket AD18-7 that would “holistically examine the resilience of the bulk power system.”
- The FERC directed ISOs and RTOs to make filings within 60 days and for other stakeholders to respond to those filings with their own comments.

AD18-7 filings

- Hundreds of comments were filed in AD18-7
- They included requests to immediately order compensation for specific resources (coal and nuclear were prominently mentioned)
- Some commentators suggested FERC should order specific remedies such as new gas pipelines in the Northeast
- Others requested a thorough investigation into what “resiliency” and “reliability” meant for electric power grids
- Other comments focused on the tension between fuel-neutral wholesale markets and state policies and programs that favored specific resources

FERC PJM Order

- Concurrent with AD18-7 filings, PJM proposed changes to its capacity market design to address the impact of state-supported resources on its wholesale markets (ER18-1314). These “subsidized” resources include renewables, nuclear plants in Illinois, and coal plants in the Midwest.
- On June 29, the FERC rejected PJM’s proposed tariff changes, found PJM’s capacity market not just and reasonable and unduly discriminatory, and opened a new proceeding (EL18-178) for a paper hearing on necessary PJM tariff changes.

FERC PJM Order (cont.)

- FERC directed PJM to institute a minimum offer price rule (MOPR) for all resources (currently only gas-fired resources are subject to a MOPR).
- FERC also directed PJM to consider a Fixed Resource Requirement Alternative that would allow individual resources receiving out-of-market support to opt out of the capacity market, along with a commensurate amount of load.

FERC ISO Order

- Concurrent with AD18-7 filings, ISO New England requested a waiver of its tariff to allow ISO-NE to retain Mystic Station with a two-year cost-of-service agreement. ISO-NE stated that Mystic was needed for winter fuel security. ISO-NE also proposed to file tariff changes by November 2018 to accommodate any future such requests without the need for a waiver (ER18-1509).
- On July 2, the FERC rejected ISO-NE's waiver request and directed ISO-NE to demonstrate (in 60 days) whether its tariff was just and reasonable and not unduly discriminatory or file changes to make it so. FERC opened a new docket EL18-182 to consider any tariff changes.

FERC ISO Order (cont.)

- ISO-NE has stated that it will file tariff changes by August 31 that will define a fuel security reliability risk, evaluate requests for cost-of-service agreements through a winter reliability model, and incorporate any compensation agreements into its wholesale market design.
- Compensation for Mystic Station will continue in a separate proceeding (ER18-1639) on an accelerated schedule.
- ISO-NE will also file tariff changes by July 2019 for new markets or market products that will eliminate the need to retain resources for fuel security reliability.

What do these two FERC Orders suggest?

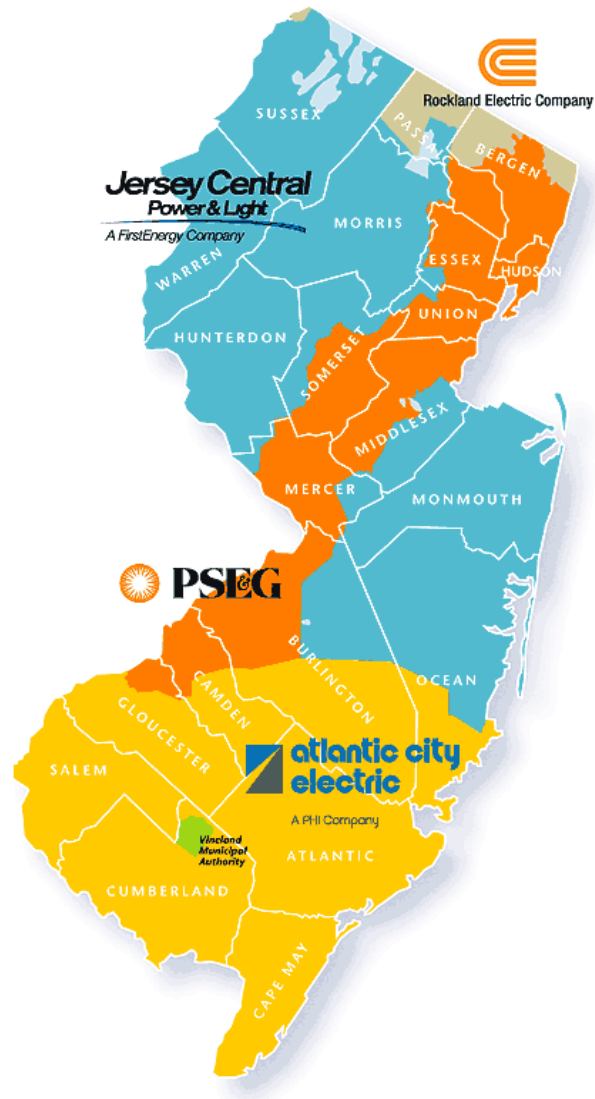
- Is the FERC eager to move forward on resiliency issues without waiting for proceedings in AD18-7 to conclude?
- Does the FERC equate the inability of RTOs to retain needed resources as a tariff failure that requires a prompt remedy?
- Is the FERC creating a new reliability criteria called “fuel security” that can trigger out-of-market payments to resources that create a reliability violation if they retire?
- Is the FERC intentionally encouraging a residual capacity model for RTOs similar to MISO’s capacity construct?

New Jersey Resiliency Response Post-Major Events

Outline

- Major Events Impacting New Jersey: 2011 & 2012
- BPU Storm Orders
- NJ EDC Responses
 - PSEG Energy Strong
 - RECO Storm Investments
 - ACE PowerAhead
- Additional regulations
 - Vegetation Management Regulations
 - Infrastructure Investment Plans
 - Energy Strong II

Background: New Jersey Electric Distribution Companies

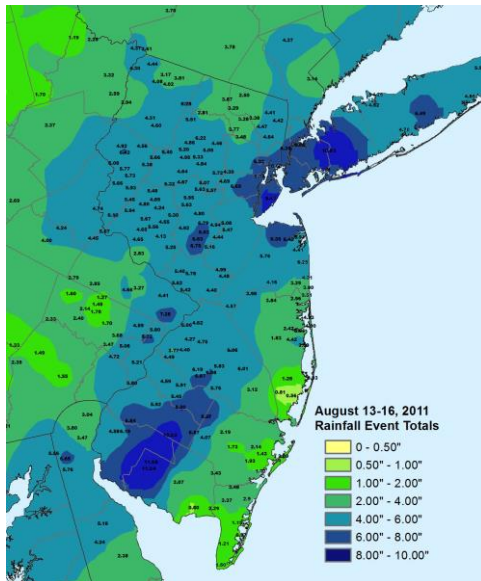


- **PSEG**
 - 2.2 million customers
- **JCP&L**
 - 1.1 million customers
- **ACE**
 - 530,000 customers
- **RECO**
 - 70,900 customers

Major Events in New Jersey 2011 & 2012

New Jersey legislation defines “Major Event” as an outage impacting 10% or more of service territory.

	Number of Customers	Maximum Percent of Customer Out		
		Hurricane Irene (August 2011)	October Storm (October 2011)	Superstorm Sandy (October 2012)
PSEG	2,211,770	39%	26%	91%
JCPL	1,100,000	71%	39%	51%
ACE	530,000	52%	0%	38%
RECO	70,900	38%	49%	84%



Selected NJ BPU Responses

Docket EO11090543

- *January 23, 2013 Order*
- *Five categories*
 - Preparedness efforts
 - Communications
 - Restoration and response
 - Post Event
 - Underlying infrastructure issues

Docket AX13030197

- *March 20, 2013 Order*
- *Establishes procedural process for the Board to review major event mitigation proposals*

N.J.A.C 14:5

- *Revision to vegetation management statute*
- *Requires additional tree clearing of all feeders*
- *Effective 2016*

N.J.A.C 14:3 2A

- *Establishes procedural process for the Board to review infrastructure investments*
- *Effective January 2018*

Energy Strong Proposal and Settlement (2014)

Initial Filing (20 programs: \$1.7 billion, 5 years)

Program	Action	Program Years	Cost (first 60 months) (\$millions)
Station Flood Mitigation	Raising and rebuilding infrastructure, and installing flood walls	10	\$819
Outside Plant Higher Design and Construction Standards	Change outside plant distribution to 13kV	5	\$65
	Change existing 26kV to 69kV standards	5	\$60
	Add spacer cable to eliminate open wire to targeted areas	5	\$10
Strengthening Pole Infrastructure	Accelerate pole replacements	5	\$102
	Non wood poles	5	\$3
Rebuild/ Relocate Backyard poles	Rebuild backyard poles (including tree trimming)	5	\$100
Undergrounding	Convert certain Overhead lines to Underground	5	\$60
	Replacement with submersible transformers in target areas	5	\$8
	Replacement with submersible switches	5	\$8
Relocate Electric and Gas Dispatch operating centers	Relocate critical operating centers	2	\$15
Advanced Technologies: System Visibility	Expand installation of microprocessor relays and SCADA field equipment	10	\$120
	Monitoring and visualization of distribution stations	10	\$24
Advanced Technologies: Communication Network	High speed fiber optic network	10	\$35
	Pilot satellite program	5	\$3
	Advanced Distribution Management System	10	\$9
	Enhanced storm management systems	4	\$50
	Expanded communication channels	3	\$10
Reconfiguration Strategies	Establish contingency strategies through smart fuses and redundant loop schemes	5	\$200
Emergency Generators	Stockpiling emergency generators	1	\$2
Total			\$1,703

Settlement

Three programs (\$620 million)

- Substations (29 stations)
 - \$420 million (additional \$200 million)
- Advanced Technologies
 - \$100 million
- Contingency Reconfiguration
 - \$100 million
- Four-year completion

Superstorm Sandy Damage and Response

Flooded control room:
Sewaren substation



Raised Sewaren substation



RECO Storm Mitigation Proposal and Settlement (2015)

Initial Filing

Substation Flood mitigation Muscle wall	\$300,000 Capital \$50,000 O&M
Overhead Hardening Spacer cable, etc	
Overhead Enhancement Program Critical infrastructure	\$2,643,500 Capital (total) \$661,300 O&M (total)
Harrington Park	\$830,000 Capital \$207,700 O&M
Haring Corner	\$731,800 Capital \$183,000 O&M
Old Tappan Rd Reconductor	\$331,600 Capital \$82,900 O&M
Old Tappan Rd to Blanche Ave	\$750,000 Capital \$187,700 O&M
Selective Undergrounding Blanket 2 miles per year for first 5 years (15 to 20 years plan)	\$13,000,000 Capital
Selective Undergrounding Specific	\$13,198,000 Capital (total)
Ringwood Substation	\$7,240,000 (under grounding) \$868,000 (new circuit)
West Milford Substation	\$5,090,000
Distribution Automation Volt/Var	\$8,000,000 total (\$1,600,000 for 5 yrs)
Enhanced Vegetation Management	\$1,146,000
AMI Replace 58,000 old meters 5 year program	\$21,000,000 Capital \$8,300,000 O&M (20 year estimate-MUP-1)
Total	\$61,059,500 Capital (Exhibit ARP-1 Schedule 3) \$4,173,000 O&M (Exhibit ARP-1, Schedule 6)

Settlement

Four programs (\$15.7 million)

- Overhead Enhancements (5 projects)
 - \$2.3 million
- Substation flood barrier
 - \$0.3 million
- Undergrounding
 - \$5 million
- Distribution Automation
 - \$8 million
- Three-year completion

ACE PowerAhead Proposal and Settlement (2016)

Initial Filing

Program	Budget (000's)
Distribution Automation	\$15,000
Selective Undergrounding	\$11,000
Open Wire Secondary	\$20,000
Feeder Hardening	\$30,000
Feeder Hardening (Nine)	
Fuse Replacement	\$5,000
Barrier Island Feeder Ties	\$13,000
Mutual Assistance Staging Center	\$6,000
Operations Center	\$29,000
Harbor Beach Substation	\$14,000
Smart Node Street Lighting Project	\$23,000
Distributed Energy	\$10,000
Total	\$176,000

Settlement

Six programs (\$79 million)

- Overhead Hardening
 - \$24 million
- Undergrounding
 - \$11 million
- Barrier Island Feeders
 - \$13 million
- Distribution Automation
 - \$15 million
- Electronic Fusing
 - \$2 million
- New Substation
 - \$14 million
- Five-year completion

Takeaways

Independent monitor may be helpful for large and complicated efforts

- Energy Strong required the retention of an independent monitor
- Resulted in on-time delivery of projects and some overall project savings (currently \$133.6 million for substation program)

Substation investments

- Raise and Rebuild generally preferred method
- Retirement of substation should be an option

Metrics

- For Energy Strong, one metric was the utilization of 5-year all event CAIDI
- Fortunately, in the last five years many circuits have not experienced major events

Questions?

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