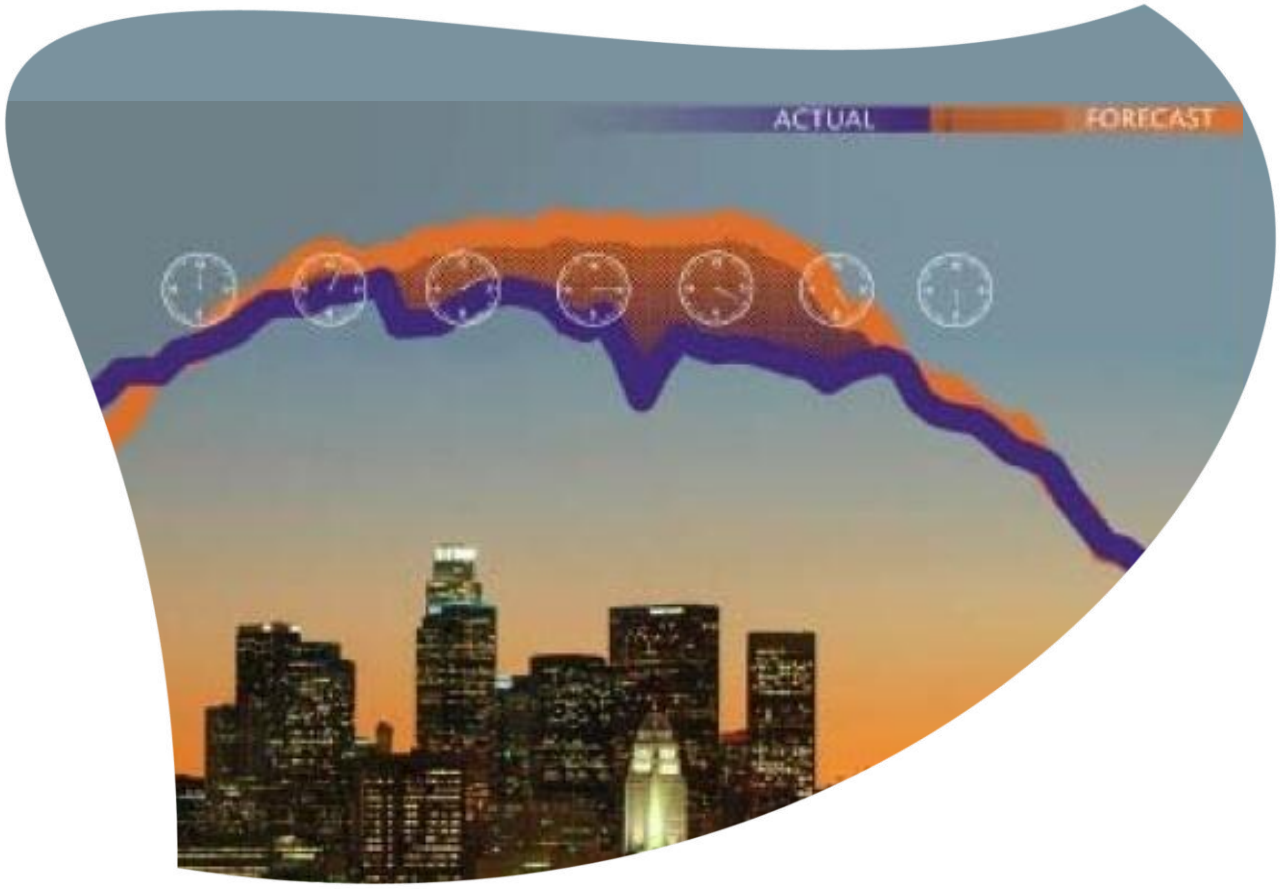
PJM DR Operational Changes

MADRI, September 2014



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Johnson Controls is a Fortune 100 company that provides energy and building management services worldwide. Johnson Controls purchased EnergyConnect on 2011 and EnergyConnect remains a wholly owned subsidiary of Johnson Controls.

Johnson Controls provides Demand Response services in PJM, NY, California, and Texas through its award winning GridConnect platform.

DR Changes

DR Operational Changes

- **Default 30 minute response –**
  - PJM requirement for DR to curtail within 30 minutes – unless certain narrow exception criteria are met.
- **Reduced offer caps –**
  - PJM's tariff change reduced energy offer caps for DR – in many cases by more than 50%.
- **Pre Emergency/Emergency –**
  - Divides DR into *Pre Emergency* and *Emergency* (Emergency Generator) Segments

DR Changes

DR Operational Changes

- **Minimum run times**
  - Reduces the minimum event time from 2 hours to 1 hour.
  - Requires M&V changes to address the possibility of an event spanning less than one clock hour
- **Performance netting**
  - This change broadens the geographic areas over which DR aggregators can combine performance, allowing under performing resources to be offset by over performing resources.

Maximum DR Limits

- Change – PJM capped the amount of Limited and Extended Summer DR that can clear in the BRA. Prior rule had allowed added DR to clear in the BRA in excess of required Reserve Margins.

30 Minute Response

PJM requirement for DR to curtail within 30 minutes – unless certain narrow exception criteria are met.

Issues

- **Default to 30 minutes – there may be many exceptions to process**
- **Potential loss of resource to the market.**
- **Potentially very strict interpretation of exceptions**

Impact – loss of resources. How much?

30 Minute Response - Exceptions

- **Physical Equipment or feedstock damage**
- **Safety**
- **Generator Start time**
- **Mass market programs that have notice or implementation communications that preclude 30 minute response.**
  - Program or tariff requirements are not acceptable reasons for longer response time.

Reduced Offer Caps

PJM's tariff change reduced energy offer caps for DR – in many cases by more than 50%.

Background – DR resources are compensated for the *energy* market value of their reductions. The strike price caps were reduced from as much as $2800/MWh to $1100/MWh.

Impact

- **Reduced viability of Annual DR. Offer caps are often well below hourly costs of curtailment leading to reduced benefit of RPM participation due to unlimited operations obligation.**
- **Contrast with PJM's willingness to facilitate higher bids and compensation for generators during the January events.**

Pre Emergency/Emergency

Divide DR into *Pre Emergency* and *Emergency* (Emergency Generator) Segments

- **PJM goal to reduce NERC level EEA2 Emergency declarations which are needed to allow Emergency Generator operations**
- ***Emergency* will include sites with Emergency Generators.**
- **While some customers may prefer to respond only in Emergencies, the change is not expected to have noticable impact on participation.**

Impact will likely be reduced commitment of the *Emergency* category

Performance Netting

This change broadens the geographic areas over which DR aggregators can combine performance, allowing under performing resources to be offset by over performing resources.

- **Old method was by Transmission Zone (utility)**
- **New method is by unconstrained LDA**
- **Brings DR treatment into alignment with generation**
- **Impact is expected to be small – some improvement in credited performance and reduced penalty risk. Possible increase in actual DR supplied in the long run.**

DR Limits

Change – PJM capped the amount of Limited and Extended Summer DR that can clear in the BRA. Prior rule had allowed added DR to clear in the BRA in excess of required Reserve Margins.

Impacts:

- **Reduced DR prices – Example – In PPL for 2017-18 Limited DR was valued at only one third of generation.**
- **Reduced DR participation**
- **High probability that only half of allowed Limited DR participation will be reached due to bias in PJM Load forecasts.**
  - PJM average 3 year ahead error over the last 10 years is 3% higher than in year forecast

Final Remarks / Questions?

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