



# 2014 / 2015 Winter Readiness

TOA-AC

December 5, 2014

## Winter 2014 / 2015 Considerations

### Cold Weather Resource Capability Testing and Preparation Checklist

Gas Unit Commitment coordination in real-time operations to include: clarity in dispatcher communications, sharing and validation of existing and new unit parameters (e.g. notification times, dual fuel capability and availability, fuel inventories, resource limitations), commitment of long lead-time units (should reduce uplift) , intraday cost schedule changes.

Generator survey of fuel inventory and operational capabilities.

Improved data sharing and coordination with the gas industry.

Energy and Reserve pricing improvements to more appropriately reflect real-time operations.

Tool and Process improvements to address Interchange Volatility.

Improvements in interregional coordination to improve situational awareness during emergencies.

Improvements in emergency procedures – Voltage Reduction data and procedures and Emergency Energy bid procedures

## PJM Studies, Data Requests, Drills & Training

- PJM Operations Assessment Task Force (OATF) Winter Operating Study (Nov. 2014)
- PJM Emergency Procedures Drill (Nov. 17, 2014)
- Fuel Inventory Survey (Nov. 2014)
- Pre-winter dispatch training webinar covering changes since last winter & review of Emergency Procedures (Dec. 2014)

## Reliability Coordinator Meetings

- Reliability *First* Winter Assessment (Nov. 2014)
- Joint MISO/PJM/NPCC Operations Coordination Meeting (Nov. 12, 2014)
- SERC Operating Committee / VACAR Pre-winter coordination Meetings (Oct. 2014)
- NYISO / PJM Winter Coordination meeting (October 23, 2014)

## Gas / Electric Coordination

- Joint INGAA – Inter-RTO Council Meeting (Sept. 3, 2014)
- Pennsylvania Independent Oil & Gas Association (PIOGA) Pipeline and Gas Market Development Committee (Sept. 8, 2014)
- PJM Winter gas preparation meeting (October)

RTO	MW
2014 / 2015 Unrestricted Load Forecast*	133,510
2014 Total Installed Capacity (ICAP)**	183,013

\*50/50 PJM Coincident Peak Load. Unrestricted means Demand Response was not subtracted

\*\*ICAP, includes generation internal to PJM (internal RPM / FRR and other internal iron in the ground), external imports to PJM, and Annual DR as of 12/01/2014)

## Peak Load Base Case Study Results

- No reliability problems identified
- Off-cost and switching used to control local thermal and voltage violations in some TO zones

Peak Load Base Case	
Case Load	137,095 MW
RTO Net Interchange	4,061 MW (Importing)
PJM RTO Installed Capacity	183,012 MW
Discrete Outages	23,105 MW

In addition to the base case winter analysis (OATF study) the following sensitivities will be run:

- 90/10 Load Forecast (142,550 MW) –*In progress*
- Higher outage amounts (41,000 MW) –*In progress*
- Gas pipeline contingencies based on EIPC studies –*Complete*

## Power flow cases created to simulate the outage of three major interstate natural gas pipelines

- Generation on each pipeline taken out of service
- Makeup power coming from surrounding non-gas fired generation
- Higher than normal amount of interchange importing into PJM

Pipeline	Generation	Area
Transcontinental Pipeline (Transco)	~ 10,400 MW	New Jersey, Delaware and the Philadelphia
Texas Eastern Pipeline (Tetco)	~ 6,100 MW	Eastern Pennsylvania and Northern New Jersey
Natural Gas Pipeline (NGPL)	7,700 MW	Northern Illinois and Chicago

- PJM can be operated reliably during most abnormal gas shortage situations.
- Contingency (N-1) analysis on each case revealed a large number of thermal and voltage violations. Most could be controlled pre-contingency by additional off cost generation or Post-contingency Local Load Relief Warning (PCLLRW)
- Transco power flow case: the N-1 analysis showed the possibility for pre-contingency load shed being required.
  - 17 non-converged contingencies for the loss of Eastern generation
  - Emergency procedures likely needed to control contingencies

