



2015 Winter Operations Update

April 7, 2015

TOA-AC

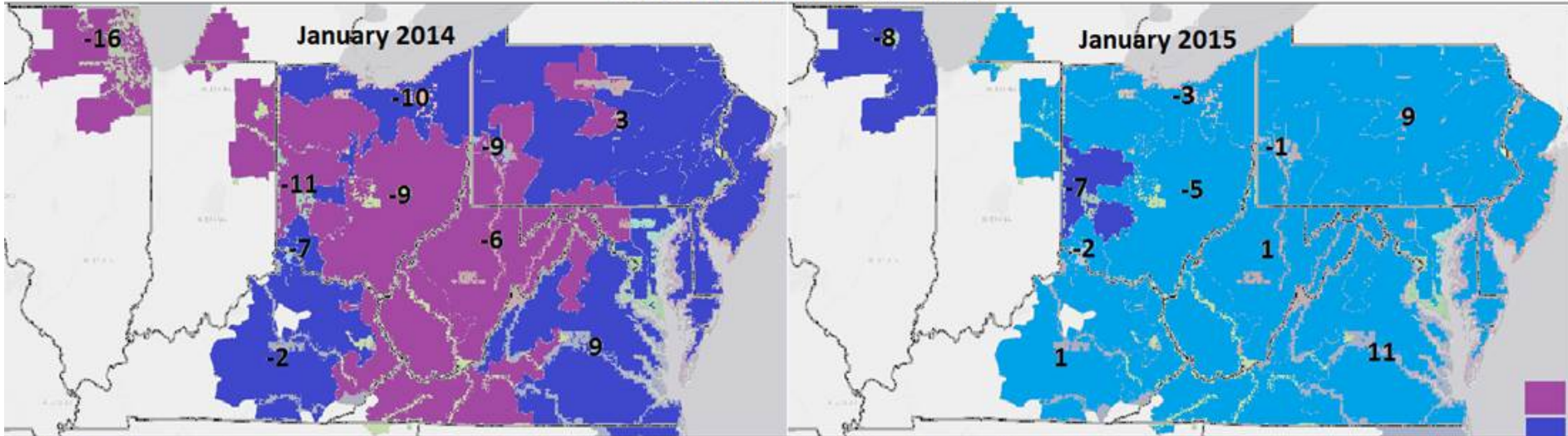
Chantal Hendrzak

2014

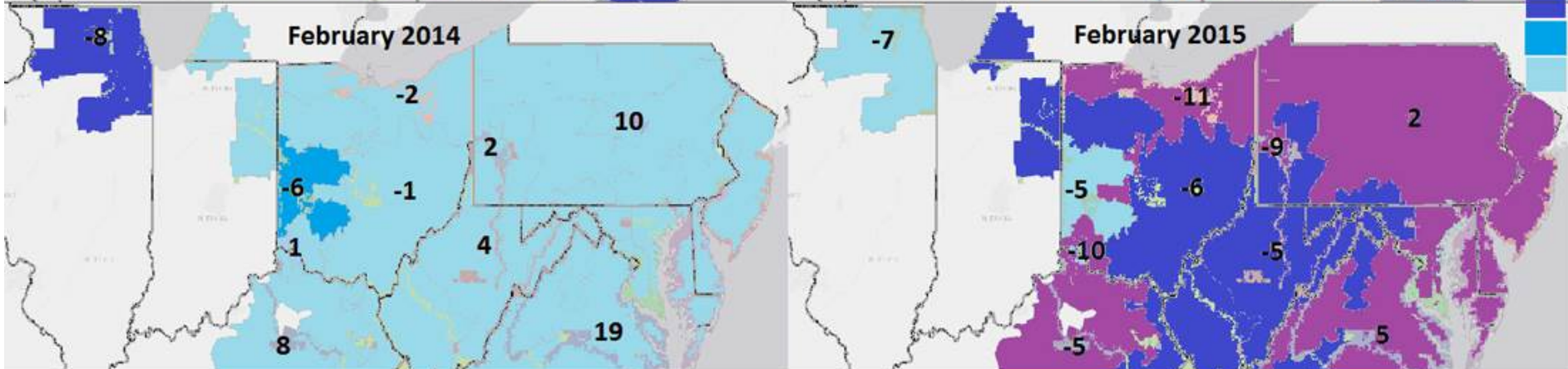
2015

Lowest Temperature by Month

January



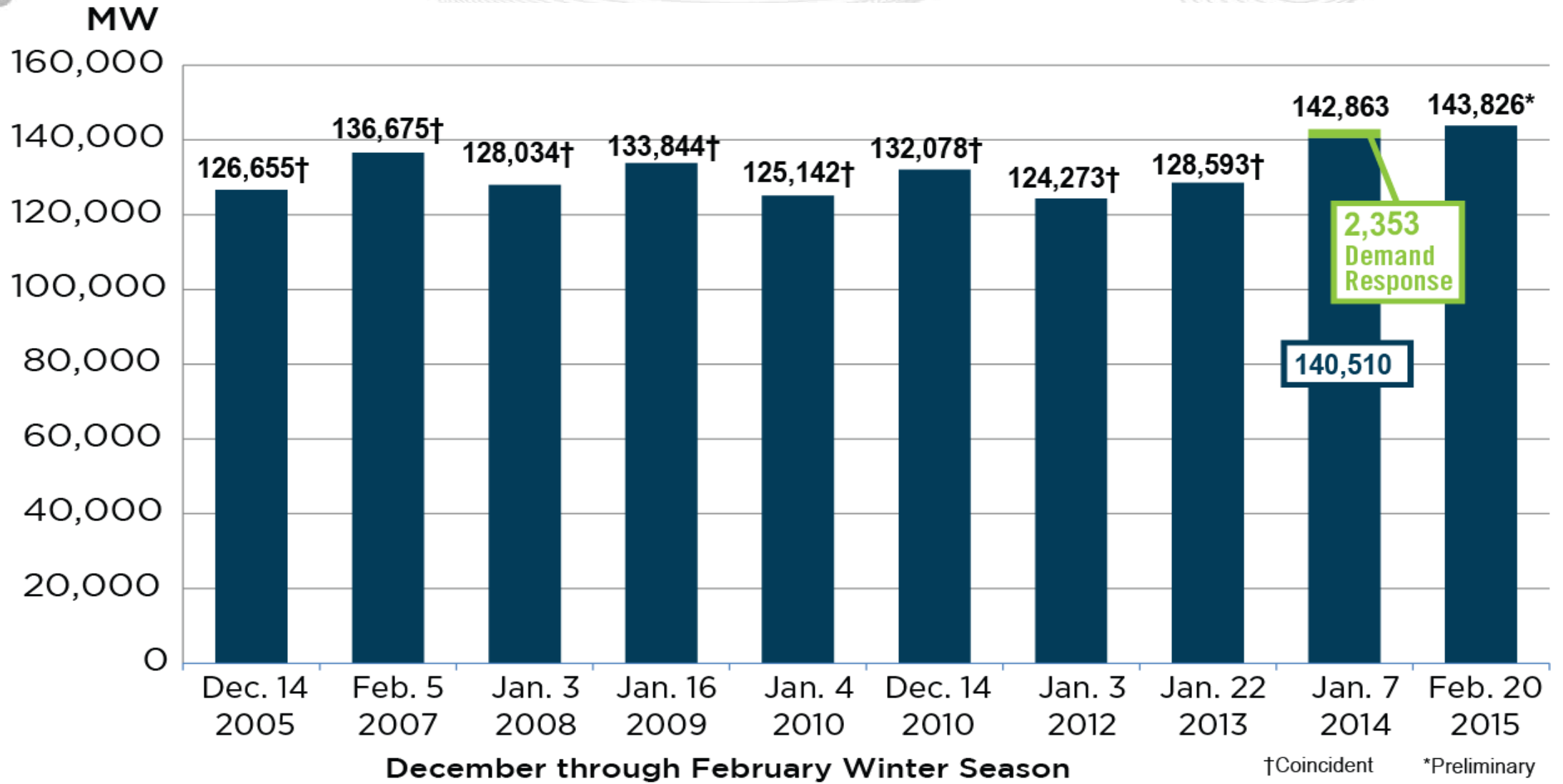
February



By Zone:

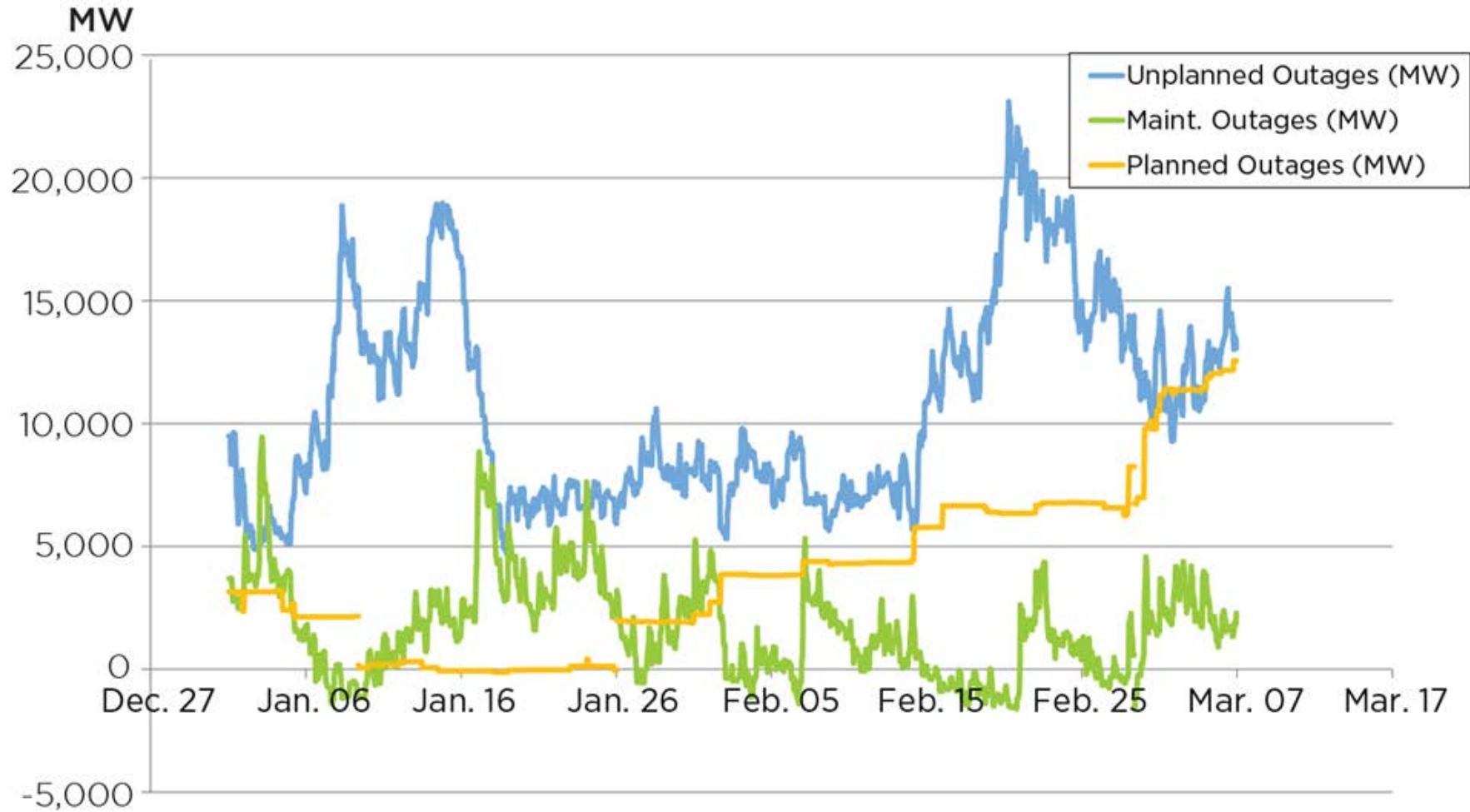
Coldest

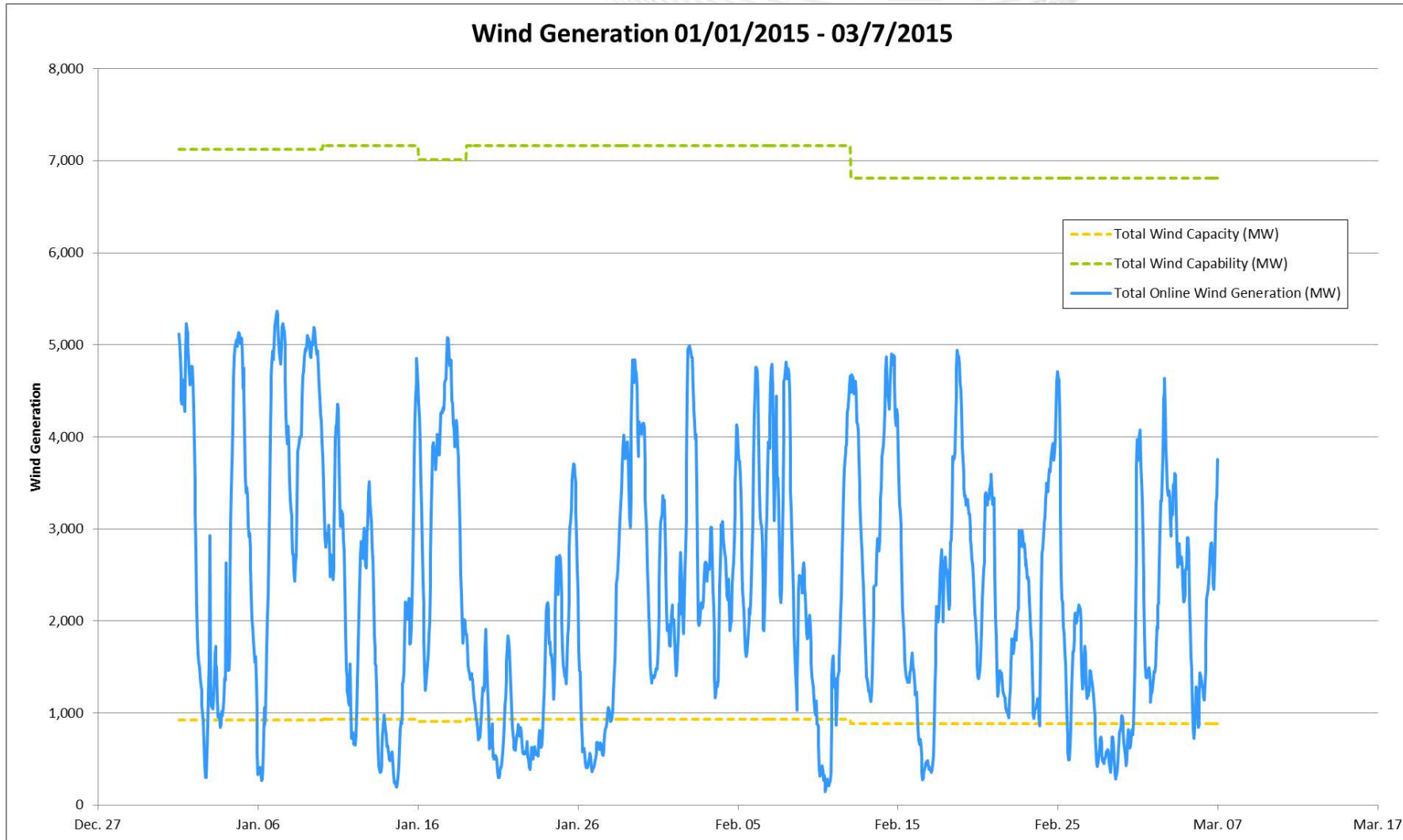
Least Cold



Date	Total Forced Outages ALL fuel types (MW)	Forced Outage Rate	Total Forced Outages – Gas Availability Issues (MW)	% of Total Forced Outages due to Gas Availability Issues
2/19 Evening	19,996	10.78%	6,945	34.7%
2/20 Morning	24,805	13.34%	7,420	29.9%

NOTE: All outage numbers are approximate and will be finalized when GADs data is submitted and reviewed.





- January – up to 5,000 MW @ peak
- February – up to 3,000 MW @ peak

- Better generator performance:
 - 13.3% (2015) vs. 22% (2014) forced outage rate
 - More heightened awareness, winter testing and winter preparation (checklist)
 - Generators' start-up, cycle, and some offer behavior modifications
 - Improved communication with PJM (updating unit parameters in systems, discussing flexibility, submitting outage information)
- Gas procurement issues still present but better managed:
 - 7,420 MW or 29.9% (2015) vs. 9,500 MW or 24% (2014)
 - Fewer operational challenges with dual fuel units like emission limitations, fuel deliveries, less forced outages
 - Improved fuel management strategies (oil inventory, use of unit parameters, reporting)



GMD Event

3/17/2015

- Prepare (before the event)
 - Alerts/Warnings issued by Space Weather Prediction Center (SWPC) /NOAA typically 1-3 days in advance and monitored by PJM
 - Include Intensity (K-scale) and latitudes impacted
 - Notify members and neighbors as needed
 - Perform sensitivity studies ensure adequate system resiliency for future operating periods
 - Screen for loss of EHV capacitors, loss of major generating sites such as Artificial Island, loss of EHV transformers, etc.
 - Schedule additional generation if needed
 - Potentially delay/defer/restore transmission and generation outages

- Monitor (during the event)
 - Meters are in place at ~50 stations to watch for GMD impacts in real time
 - Adjust/operate more conservatively based on system conditions
 - Coordinate with members, neighbors, etc. as the situation dictates

- Relevant SWPC GMD postings
 - 3/17 @1334 UTC (Coordinated Universal Time) (0934hrs Eastern)
 - K-7/G-3 poleward of 50-degrees for the period of 1200-1500 UTC.
 - 3/17 @1401 UTC
 - Upgraded to K-8/G4 poleward of 45-degrees for the period of 1200-1500 UTC.
 - 3/17 @1757 UTC
 - K-8/G4 poleward of 45-degrees through 1800 UTC.

- Posted GMD notices to Emergency Procedures website
- Coordinated with Members and Neighbors to review geomagnetically induced current (GIC) meter data and system conditions
- Triggers for Conservative Operations were not met, but PJM studied the additional GMD contingencies to be prepared:
 - **No overloads or low voltages were observed**
- No GMD related impacts observed or reported on the system (internal or external)

