

# Transmission Expansion Advisory Committee

February 20, 2009



# Long Term Reactive Plan

- In 2006 the Planning Committee approved including reactive planning for a 10 year RTEP model.
- Analysis focuses on 345 kV, 500 kV and 765 kV to determine the more global reactive needs in year 10 – 2018
- Analysis is limited to areas of the system where thermal problems were identified in the 6 -15 year analysis
- For the 2008 RTEP thermal problems were identified in the Eastern Mid-Atlantic, Southwest Mid-Atlantic and Mid-Atlantic regions of PJM

- PJM completed load deliverability voltage analysis for 2018 of the Mid-Atlantic, Southwest Mid-Atlantic and Eastern Mid-Atlantic
- Load deliverability was the main driver for the majority of the overloads identified in years 6 through 15
- High load conditions modeled in the load deliverability analysis are when PJM typically sees voltage issues on the system

- PJM identified the need for approximately 3,000 MVAR of reactive devices by 2018 in order to provide for an adequate voltage profile for N-0 and N-1 conditions
- If the entire 3,000 MVAR were static switched capacitors the cost would be estimated at \$60 M
- If 20% of the 3,000 MVAR were required to be dynamic with the remaining switched capacitors the estimated cost would be \$108 M
- PJM used \$20K per MVAR for static reactive and \$100 K per MVAR for dynamic reactive

- Last year's long term reactive analysis identified the need for approximately 3,000 MVAR of reactive reinforcements by 2017.
- The reduced load forecast appears to be the primary driver responsible for the lack of increase in the reactive needs from last year's study.



# 2009 RTEP Assumptions

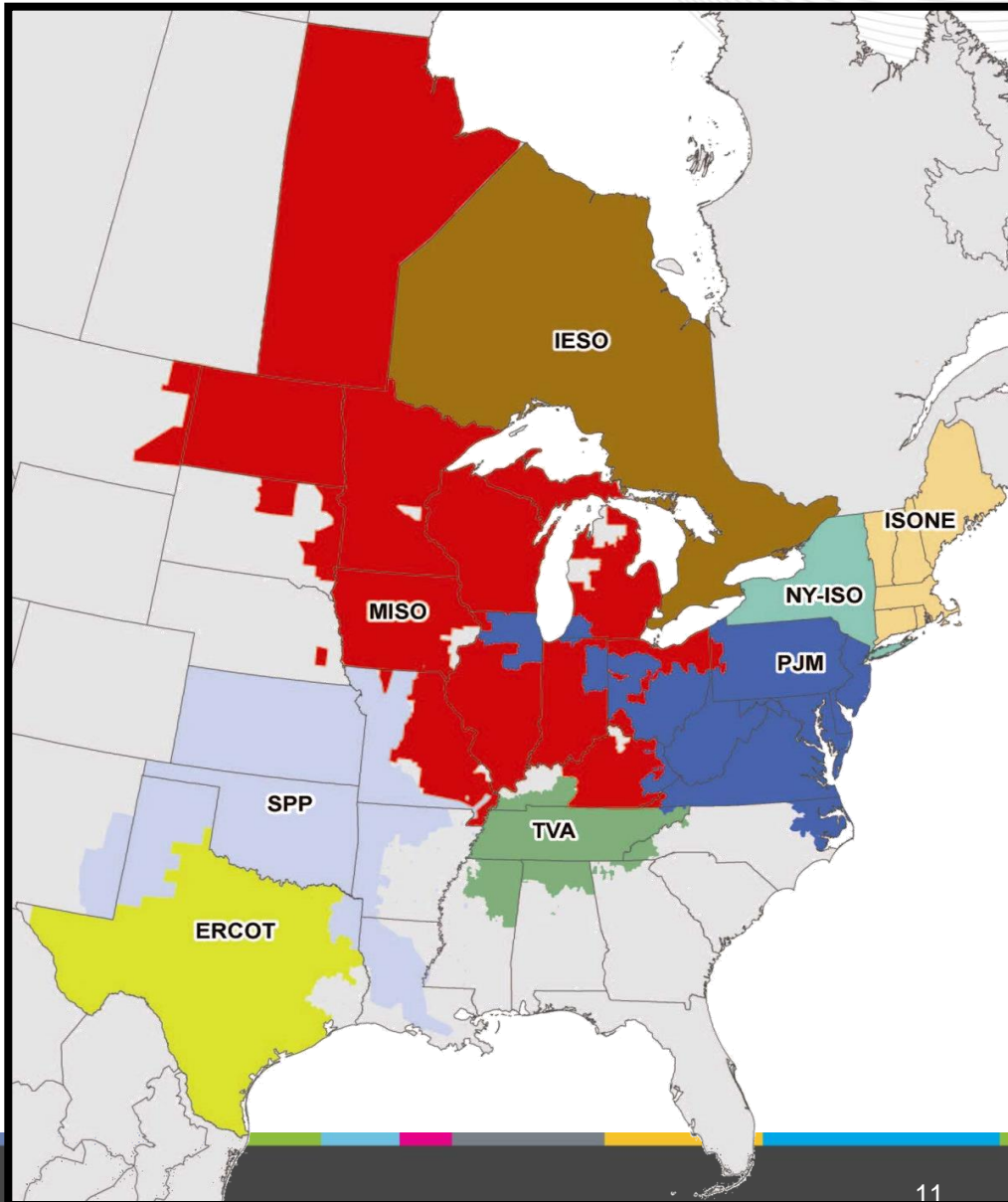
- Generic assumptions consistent with those discussed at the January TEAC
- Loads – Based on the 2009 Load Report
  - RTO Peak: 153,377 MW
    - PJM South: 21,140 MW
    - PJM West: 67,099 MW
    - PJM Mid-Atlantic: 65,138 MW
      - \* All Loads are Non-Coincidental Peaks
- Generation
  - Machine lists posted to TEAC page
  - Previously discussed units
    - Potomac River - in
    - Bergen - in
    - Indian River 3 & 4 – in
    - Sewaren - in
    - Catoctin – out



<b>2013 Retool CETO</b>	
<b>Area</b>	
JCPL	4520
PSE&G	6500
Delmarva	1490
Dominion	2120
Delmarva South	1580
PSE&G North	2810
SWMAAC	6280
MAAC	6860
EMAAC	8240



# 2009 Interregional Planning Activities



- ❖ PJM / NYISO focused study
- ❖ PJM/MISO/SPP/TVA Interregional Planning Initiatives...wind...DOE
- ❖ Southwest Indian Study

- **Reliability Analysis**
  - N-1-1 analysis for all 230 kV and above facilities
  - Generator deliverability testing of PJM generation to PJM load and NYISO generation to NYISO load, while monitoring adjacent area facilities
  - Analyze peak (90/10) summer conditions while simulating a capacity deficiency in the combined PS-North / ConEd system.
  - Perform sensitivity analysis on credible retirement scenarios for critical transmission contingencies identified above.
  - Develop potential transmission overlay options to resolve the issues identified in the reliability analysis.
- **Market Efficiency Analysis**
  - Complete a market simulation of the combined NYISO/PJM system
  - Identify areas with the highest LMP spreads
  - Identify facilities producing the highest projected congestion
  - Test the market efficiency impact of the potential solutions identified in the reliability analysis.

- Joint Coordinated System Plan Study (JCSP)
  - Market Efficiency and Wind Integration focus - 2024
    - \$80+ billion to integrate 20% wind and limiting congestion
  - Included reliability screen of combined 2018 regional plans
    - Plans integrate well. No major issues surfaced.
  - Reports to be posted soon on [www.jcspstudy.org](http://www.jcspstudy.org)
  
- Eastern Wind Integration Transmission Study
  - Follows the JCSP siting and transmission methods
  - Updated DOE wind data for siting
  - New work on operational impacts and reliability analysis
    - First impressions of regulation estimates and LOLP impacts

- **Reliability Analysis**
  - Develop a combined PJM / MISO 2014 model.
  - Simulate N-1, N-2 and N-1-1 contingencies.
    - N-1-1 contingencies will include combinations of PJM and MISO facilities
  - Develop solutions to potential reliability issues identified above.
    - Sensitivity analysis on potential solutions
- **Economic Study – evaluate market efficiency of potential project alternatives**

- Subregional RTEP Committee meetings
  - Review 2009 RTEP assumptions
- 2013 Retool analysis is underway
- 2014 Case complete
- Retool of other years will follow once case creation is complete
  - 2010 case nearing completion