2015 Reserve Requirement Study
Status Report and Load Model Selection

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Planning Committee
July 9, 2015
• Study results will re-set IRM for 2016/17, 2017/18, 2018/19 and establish initial IRM for 2019/20.
• Generation Owner review of PJM capacity model has been completed.
• PJM and World capacity models have been completed.
• PJM and World load models to be finalized at July 9 PC meeting.
• On target to send preliminary study results to PC in September.
  PC will vote on IRM in October.
PJM Load Model Selection for 2015 RRS
• 2015 RRS uses 2015 Load Forecast Report. Focus is on 2019/20 Delivery Year.

• Load Model (LM) in RRS
  – 52 normal distributions (mean, standard deviation)
  – Based on historical loads using PLOTS
  – What time period to use?
    • 7 delivery years or more of recent data
    • Availability of load data for PJM and neighbors
    • 45 Candidates: from 1998 – 2012 (14 years) to 2006 – 2012 (7 years) and all other LM candidates in between
• Analysis based on method approved at July 2009 PC meeting
• Choose a LM that is consistent with the CP1 (CP: Coincident Peak) distribution in 2015 Load Forecast for 2019/2020 DY
  – Daily peak load forecast regression models based on load history from 1998 -2014
  – Uses 41 years of weather history to develop a range of forecasted loads
  – CP1 distribution in 2015 Load Forecast has 533 scenarios

<table>
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<th>Scenario</th>
<th>MW</th>
<th>Prob</th>
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<tr>
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<td>1/533</td>
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<tr>
<td>533</td>
<td>180000</td>
<td>1/533</td>
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</tbody>
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• Consider historical PJM/World load diversity
CP1 Cumulative Distribution

Cumulative Probability

Summer Peak Load

Forecast

LM Candidate
• Recreate CP1 distribution with each LM candidate

• Two approaches
  – Approach 1
    • Assume probability of each CP1 scenario as given (1/533)
    • With LM candidate, compute corresponding MW number for each scenario
    • For each scenario, compute error between MW number generated with candidate LM and MW number in CP1 distribution. Add 533 errors (MW error)
  
  – Approach 2
    • Assume MW value in each CP1 scenario as given
    • With LM candidate, compute corresponding probability for each MW value
    • For each scenario, compute error between probability calculated with candidate LM and probability associated with scenario in CP1. Add 533 errors (probability error)
Load Model Selection – Approach 1

Approach #1 Results

Load Models
- CP1
- LM.50703 2001-2012 #2
- LM.50714 2003-2012 #4
- LM.50739 1998-2004 #1
- LM.50746 2005-2011 #27
• Load Model (LM) Choices
  – 50703: 2001-2012  12 YR LM
  – 50714: 2003-2012  10 YR LM

• Last year’s selected LM (2004 – 2011) is not a top candidate this year. This is due to:
  – Load Models including 2012 are a much better fit for the CP1 distribution
    • If LM 50703 and LM 50714 had been candidates last year, they would have ranked higher than 2004 - 2011
Two-area pattern assessment

Weekly Expected Peak – LM 2001-2012

Weekly Expected Peak - LM 2003-2012
2015 RRS Load Model Recommendation

- PJM recommendation on selection of historical time period for load model:
  - Use 10yr (2003-2012, #50714) Load Model for 2015 RRS Base Case
    - No major apparent differences with LM #50703 in the two-pattern area assessment
PC Action Item

- Endorsement of the PJM recommendation to use the following load model in the base case for the 2015 IRM Study:
  - 10yr (2003-2012, #50714) Load Model
  - Endorsed unanimously at RAAS