• Prexy Replacement Study Update
• Overview 2014 CETO Values
• 2014 Load Deliverability Update
• New Baseline and Supplemental Upgrades
Prexy Replacement Study Update
• Reconfigure the Peters to Bethel Park 138kV line and Elrama to Woodville 138kV line to create a 138 kV path from Woodville to Peters and a 138 kV path from Elrama to Bethel Park.
• Recondutor both Collier – Woodville 138kV lines
• Add static capacitors at five substations in the area
• Cost Estimate: $11.6M
• Construct a new Osage – Whiteley 138kV line: (b0674)
• Cost: $20.9M
• This project has already been approved as a baseline upgrade b0674
• At 502 Junction Substation, install a 500/138kV transformer
• Cost: $27.2M
• Construct a new Franklin – 502 Junction 138kV line including a rebuild of the Whiteley – Franklin 138kV line to double circuit
• Cost: $17.1M
• Construct a new 502 Junction – Osage 138kV line
• Cost: $4.2M
- Construct Braddock Station, a new 138kV breaker station that connects the Charleroi–Gordon 138kV line, Washington–Franklin 138kV line and the Washington–Vanceville 138kV line including a 66 MVAr capacitor
- Cost: $15.1M
• Increase the size of the shunt capacitors at Dutch Fork 138kV substation and Enon 138kV substation:
• Cost: $0.3M
• Raise three structures on the Osage-Collins Ferry 138 kV line to increase the line rating
• Cost: $0.4M
2014 CETO Values
## Overview of 2014 CETOs

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2014 Load Deliverability Analysis Update
# 2014 Load Deliverability Status

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Study completed with no violations

Study incomplete

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www.pjm.com
Baseline Projects
• Mickleton 230/69 kV transformer T4 / loss of Mickleton 230/69 kV transformer T1

• Original Proposed Solution:
Move a Monroe substation transformer to replace Mickleton 230/69 kV transformer T4

• New Proposed Solution:
Replace Mickleton 230/69 kV transformer T4 with a new transformer (b0576)

• Estimated Project Cost: $6.875 M

• Expected IS Date: 6/01/2013
• High voltage at various stations in Dominion during light load conditions
• Install 50-100 MVAR variable reactor banks at Carolina, Dooms, Everetts, Idylwood, Northern Alexandria, North Anna, Suffolk, and Valley 230 kV substations (b0928)
• Projected ISD: 12/31/2011
• Cost estimate: $48M
• High voltage at various stations in Dominion during light load conditions
• Install 50-100 MVAR variable reactor banks at Carson, Dooms, Garrisonville, Hamilton and Yadkin 230 kV substations (b0923 – b0927)
• Projected ISD:
  – Carson: 12/31/2009
  – Dooms: 12/31/2010
  – Garrisonville, Hamilton, Yadkin: 5/31/2010
• Cost estimate: $27.5M
• Tower line outage & Dominion Criteria Violation
  – Tower line outage – Morrisville to Marsh Run overloads 115 kV network in the area.
  – Loudoun 500 / 230 kV transformer overloads for loss of the other transformer.

• Original Proposed Solution
  – Convert the Remington – Sowego 115 kV line to 230 kV
  – Add a new 230 kV line from Sowego – Gainsville
  – Add a Sowego 230 / 115 kV transformer
  – Estimated cost $30 million

• New Proposed Solution:
  – Convert the Remington – Sowego 115 kV line to 230 kV
  – Add a new 230 kV line from Sowego Gainsville
  – Add a Bristers 230 kV /115 kV transformer and feed to Sowego

• Estimated Project Cost: $30M
• Expected IS Date: 6/01/2012
• Gosport generator instability and low voltages as a result of a double line to ground fault on the Gosport to Reeves Avenue 115 kV or Gosport to Chesapeake 115 kV circuits and primary relay failure

• Proposed Solution: Install dual primary protection schemes on Gosport line 62 and 51 at the remote terminals (b0583)

• Estimated Project Cost: $0.46M

• Expected IS Date: 6/01/2010
- Generation Deliverability Violation
- Brambleton – Cochran Mill 230 kV overloads for the outage of Loudoun – Pleasant View 500 kV
- Proposed Solution: Reconductor Brambleton – Cochran Mill 230 kV circuit (b0921)
- Estimated Project Cost: $2.354M
- Expected IS Date: 6/01/2011
• Voltage magnitude and voltage drop violations at Heaton, North Wales, and Perkiomen 138 kV buses / loss of various N-1-1 contingency combinations

• Proposed Solution:
  Install a 2nd 230/138 kV transformer and 35 MVAR capacitor at the Heaton 138 kV bus (b0842)

• Estimated Project Cost: $6.4 M

• Expected IS Date: 6/01/2013
• Voltage magnitude and voltage drop violations at the Plymouth Meeting 138 kV bus / loss of various N-1-1 contingency combinations

• Proposed Solution:
  Move the connection points for the 2nd Plymouth Meeting 230/138 kV transformer (b0841)

• Estimated Project Cost: $3.0 M

• Expected IS Date: 6/01/2013
• Normal overload on Whitpain – Jarrett 230 kV for loss of North Wales – Hartman 230 kV under the N-1-1 test

• Proposed Solution:
  Replace station cable at Whitpain and Jarrett substations on the Jarrett – Whitpain 230 kV circuit (b0920)

• Estimated Project Cost: $0.7 M

• Expected IS Date: 6/01/2011
• Voltage collapse for various contingencies under the MAAC load deliverability test
• Proposed Solution:
  Install additional 130 MVAR capacitor at West Wharton 230 kV substation (b0289.1)
• Estimated Project Cost: $2.361 M
• Expected IS Date: 6/01/2011
• Unable to maintain ConEd wheel because Farragut PAR angles are limited pre-contingency in the base case
• Proposed Solution: At Hudson 345 kV, add a PAR in series with both Farragut PARs (b0922)
• Estimated Project Cost: $92M
• Expected IS Date: 6/01/2014
The following breaker upgrades are driven by the Susquehanna-Roseland 500 kV project and the Hudson 500 kV project:

- Replace Roseland 230 kV breaker '11H' with an 80 kA breaker
- Replace Roseland 230 kV breaker '31H' with an 80 kA breaker
- Replace Roseland 230 kV breaker '51H' with an 80 kA breaker
- Replace Roseland 230 kV breaker '71H' with an 80 kA breaker
- Replace Roseland 230 kV breaker '42H' with an 80 kA breaker
- Replace Roseland 230 kV breaker '22H' with an 80 kA breaker
- Replace Roseland 230 kV breaker '82H' with an 80 kA breaker
- Replace Roseland 230 kV breaker '91H' with an 80 kA breaker

- Estimated Project Cost: $800 K per breaker
- Expected IS Date: 06/01/2012
• Susquehanna – Jenkins 230 kV circuit overloads for a line fault on the Susquehanna T21 – Susquehanna 230 kV circuit coupled with a stuck breaker at Susquehanna 230 kV that removes the Susquehanna – Mountain tap 230 kV circuit from service

• Proposed Solution:
  Install motor operators on the Susquehanna T21 – Susquehanna 230 kV line East CB at the Susquehanna 230 kV switching station (b0881)

• Estimated Project Cost: $0.265 M

• Expected IS Date: 6/01/2012
Supplemental Projects
• Upgrade 345 kV line 0301 CB at Goodings Grove (s0090)
• Projected ISD: 12/31/2010
• Install second Bremo to Bear Garden 230 kV line and two breakers (s0167)
• Projected ISD: 7/1/2010
• Install 230 kV CB in 220-08 Line between Graceton and Peach Bottom #2 Startup Tap. Cooper PDM will be on the Graceton side of the new CB (s0162)
• Projected ISD: 12/1/10
• Install ring bus with six 230 kV CBs in 220-75 Line between Island Road and Grays Ferry (s0163)
• Projected ISD: 6/1/11
• Reconfigure Grays Ferry 230 kV ring bus into 230 kV straight buses at Grays Ferry and Peltz. A new 230 kV line will be extended between Grays Ferry and Peltz. The existing 220-75 will become a 3-ended line between Grays Ferry, Peltz and Penrose (s0164)
• Projected ISD: 6/1/12
• Install third 138-13 kV transformer at Holmesburg. The transformer will be connected through a new 138 kV CB between Holmesburg #8 Transformer and the 805 CB (s0165)
• Projected ISD 6/1/11
• Wrap up retool work for 2010 through 2013
• 2014 Analysis
  – Generation deliverability testing – in progress
  – Load deliverability testing – in progress
  – N-1-1
• Long-term planning will be completed once 2014 deliverability testing complete
• Subregional RTEP Committee meetings and TEAC meetings will be scheduled as we get through the 2014 analysis
Questions or Issues?