

First Addendum To 2004 Baseline RTEP Report

Addendum per the presentation at the March 1, 2006 TEAC:

1. The single contingency involving the loss of Mt. storm – Meadow Book 500 kV circuit results in an overload on the Endless Caverns – Mt. Hackson 115 kV circuit at 105% under the 2009 generation deliverability test. The recommended solution is to reconductor the Endless Caverns – Mt. Jackson 115 kV circuit by June 2009. The estimated cost is \$2 million.
2. The tower line outage involving the loss of the Morrisville – Marsh Run 230 kV circuit and the Marsh Run units results in an overload on the 115 kV circuits out of the Remington. The recommended solution is to install an SPS by June 2009. The estimated cost is \$0.05 million.
3. The single contingency involving the loss of the Red Lion – Hope Creek 500 kV circuit in an overload on the Chichester – Mickleton 230 kV circuit at 104% under the 2009 load deliverability test for the Eastern Mid Atlantic Region. The recommended solution is to upgrade the Chichester – Mickleton 230 kV circuit by June 2009. The estimated cost is \$15.5 million.
4. The single contingency involving the loss of Keeney – Rock Springs 500 kV circuit results in an overload on the Peach Bottom – Newlinville 230 kV circuit at 101% under the 2009 load deliverability test for Eastern Mid Atlantic region. The recommended solution is to replace two wave traps and ammeter at each of the Peach Bottom and Newlinville 230 kV substations by June 2009. The estimated cost is \$0.2 million.
5. The single contingency involving the loss of the Aldene – Sprigfield 138 kV circuit results in an overload on the Roseland – Laurel Ave. 138 kV “S” circuit at 102% under the 2009 load deliverability test for PSEG zone. The recommended solution is to upgrade the two 138 kV circuits from Roseland – West Orange by June 2009. The estimated cost is \$5 million.
6. The single contingency involving the loss of the West Orange – Roseland 138 kV “S” circuit results in an overload on the Roseland 230/138 kV #4 transformer at 101% under the 2009 load deliverability test for PSEG zone. The recommended solution is to replace the two Roseland 230/138 kV transformers by June 2009. The estimated cost is \$15 million.
7. The single contingency involving the loss of the New Freedom – Sickler 230 kV circuit along with the Sickler 230/69 kV transformer results in an overload on the Monroe 230/69 kV transformer at 115% under the 2009 load deliverability test for the AE zone. The recommended solution is to replace the Monroe 230/69 kV transformers #2 and #3 by June 2009. The estimated cost is \$6.9 million.
8. The single contingency involving the loss of Dennis – Corson 138 kV circuit results in an overload on the Cumberland 230/138 kV transformer at 108% under the 2009 load deliverability test for the AE zone. The recommended solution is to install a second Cumberland 230/138 kV transformer by June 2009. The estimated cost is \$4.2 million.

9. The single contingency involving the loss of either one of the Keeney 500/230 kV transformer results in an overload on the other Keeney 500/230 kV transformer at 101% under the 2009 load deliverability test for DP&L zone. The recommended solution is to join the two Red Lion 230 kV buses, replace the Red Lion 230/138 kV transformer and replace a 1200A disconnect switch on Red Lion –Reybold 138 kV circuit by June 2009. The estimated cost is \$20.6 million.
10. The single contingency involving the loss of the Carrcroft – Edge Moor 138 kV circuit at 106% results in an overload on the Christiana – Edge Moor 138 kV circuit under the 2009 load deliverability test for the DP&L Southern zone. The recommended solution is to reconductor 0.5 miles of the Christiana – Edge Moor 138 kV circuit by June 2009. The estimated cost is \$0.8 million.
11. The single contingency involving the loss of the Indian River – Millsboro 69 kV circuit results in an overload on the Laurel – Mumford 69 kV circuit at 101% under the 2009 load deliverability test for the DP&L Southern zone. The recommended solution is to upgrade the operating temperature of the 477 ACSR to 140C by June 2009. The estimated cost is \$0.8 million.
12. The single contingency involving the loss of the Indian River – Millsboro 69 kV circuit results in an overload on the North Seaford – Pine Street 69 kV circuit at 109% under the 2009 load deliverability test for the DP&L Southern zone. The recommended solution is to raise the conductor temperature of the North Seaford – Pine Street – Dupont Seaford 69 kV circuit by June 2009. The estimated cost is \$0.3 million.
13. The single contingency involving the loss of the Keeney – Rock Springs 500 kV circuit results in numerous voltage problems under the 2009 load deliverability test for the Eastern Mid Atlantic region. The recommended solution is to install 600 MVAR dynamic reactive support in the Whitpain 500 kV vicinity by June 2009. The estimated cost is \$27 million.
14. Widespread voltage issues were identified for many contingencies under the 2009 load deliverability test for the Eastern Mid Atlantic region. The recommended solution is to install the following capacitors by June 2009.
 - Install 274.6 MVAR capacitors in JCP&L at an estimated cost of \$4.95 million.
 - Install 367 MVAR capacitors in PECO at an estimated cost of \$5.1 million.
 - Install 228 MVAR capacitors in PSE&G at an estimated cost of \$6.0 million.
 - Install 58 MVAR capacitors in AE at an estimated cost of \$3.37 million.
 - Install 46 MVAR capacitors in DP&L at an estimated cost of \$1.2 million.
 - Install 35 MVAR capacitors in RECO at an estimated cost of \$0.38 millionTotal estimated cost is \$21 million
15. Widespread voltage issues were identified for the loss of the Keystone – Juniata or Keystone – Conemaugh 500 kV circuits under the 2009 load deliverability test for the Eastern Mid Atlantic region. The recommended solution is to build a new 500 kV substation connecting the Keystone – Juniata and Conemaugh – Juniata 500 kV circuits, replace two 500 kV wave traps at Juniata, replace a wave trap and bus section at Keystone, and install a 400 MVAR capacitor at the new substation by June 2009. The estimated cost is \$25.5 million.
16. The single contingency involving the loss of the Red Oak or Linden generator results in a voltage drop problem in the JCP&L and PSE&G zones under the 2009

- load deliverability test for the Eastern Mid Atlantic region. The recommended solution is to install a 130 MVAR capacitor at Whippany 230 kV substation by June 2009. The estimated cost is \$1.4 million.
17. The single contingency along with stuck breaker involving the loss of the Atlantic – Smithburg and Atlantic – South River 230 kV circuits results in an overload on the Atlantic – Larrabee 230 kV circuit at 102% under the 2009 generation deliverability test. The recommended solution is to replace 1600A line traps at both Atlantic and Larrabee 230 kV substation by June 2009. The estimated cost is \$0.1 million.
 18. The single contingency involving the loss of a bus at Chichester that outages the Chichester – Trainer 230 kV and Chichester – Linwood 230 kV circuits #1 and #2 results in an overload on the Edge Moor – Harmony 230 kV circuit at 101% under 2009 generation deliverability test. The recommended solution is to replace a 1600A disconnect switch at Harmony and increase the operating temperature of the conductor by June 2009. The estimated cost is \$0.85 million.
 19. The single contingency involving the loss of either one of the Conastone 500/230 kV transformer results in an overload on the other Conastone 500/230 kV transformer at 104% under the 2009 load deliverability test for the Southern Mid Atlantic region. The recommended solution is to replace both Conastone 500/230 kV transformers with larger transformers by June 2009. The estimated cost is \$42.5 million.
 20. The single contingency involving the loss of the Brighton – Waugh Chapel 500 kV circuit results in an overload on the Brighton 500/230 kV transformer at 102% under the 2009 load deliverability test for the Southern Mid Atlantic region. The recommended solution is to install a second Brighton 500/230 kV transformer by June 2009. The estimated cost is \$21 million.
 21. The single contingency involving the loss of either one of the Doubs – Dickerson 230 kV circuit results in an overload on the other Doubs – Dickerson 230 kV circuit at 111% under the 2009 generation deliverability test. The recommended solution is to reconductor both Doubs – Dickerson 230 kV circuits by June 2009. The estimated cost is \$9.6 million.
 22. The single contingency involving the loss of the Hatfield – Black Oak 500 kV circuit results in an overload on the Black Oak 500/138 kV #3 transformer at 130% under the 2009 generation deliverability test. The recommended solution is to implement an operating procedure to open the Black Oak 500/138 kV #3 transformer for the Hatfield – Black Oak 500 kV circuit outage by June 2009.
 23. The single contingency involving the loss of the Mount Storm – Meadow Brook 500 kV circuit results in an overload on the North Shenandoah 138/115 kV #3 transformer at 111% under the 2009 generation deliverability test. The recommended solution is to implement an operating procedure to open both the North Shenandoah 138/115 kV #3 transformer and the Strasburg – Edinburgh 138 kV circuit for the Mount Storm – Meadow Brook 500 circuit outage by June 2009.
 24. The single contingency involving the loss of the Doubs – Bedington 500 kV circuit results in an overload on the Bedington – Nipetown 138 kV circuit at 101% under the 2009 generation deliverability test. The recommended solution is

- to replace the existing 954 ACSR conductor on the Bedington – Nipetown 138 kV circuit with high temperature / low sag conductor by June 2009. The estimated cost is \$0.43 million.
25. The single contingency involving the loss of Morrisville – Meadow Brook 500 kV circuit results in an overload on the Double Tollgate – Old Chapel 138 kV circuit at 102% under generation deliverability test. The recommended solution is to rebuild the Double Tollgate – Old Chapel 138 kV circuit with 954 ACSR conductor by June 2009. The estimated cost is \$1.95 million.
26. The following 69 kV circuits were overloaded in 2009:
- Either one of the Colfax – Highland 69 kV circuit at 108% for the loss of the other circuit.
 - The North 138/69 kV transformer at 130% for tower contingency involving the loss of both Pine Creek - Colfax 69 kV circuits.
 - The Bucyrus – Elrama 69 kV circuit at 111% for tower contingency involving the loss of the Elrama – Wilson 69 kV and Elrama – General Motors 69 kV circuits.
 - The Dravosburg – Bucyrus 69 kV circuit at 111% for tower contingency involving the loss of the Elrama – Wilson 69 kV and Elrama – General Motors 69 kV circuits.
- The recommended solution is to convert the supply from North to Wilmerding from 69 kV to 138 kV by June 2009. This project requires the following upgrades:
- Convert the Pine Creek substation from 69 kV to 138 kV at an estimated cost of \$2.55 million.
 - Convert the North substation from 69 kV to 138 kV at an estimated cost of \$2.5 million.
 - Convert the Highland substation and Highland – Logans Ferry circuits from 69 kV to 138 kV at an estimated cost of \$15 million.
 - Convert Wilmerding substation from 69 kV to 138 kV at an estimated cost of \$3.6 million.
 - Convert Dravosburg – Wilmerding circuit from 69 kV to 138 kV at an estimated cost of \$0.15 million.
27. The tower contingency involving the loss of the two Crescent – Phillips 138 kV circuits results in an overload on the Valley – Wolf Run and Phillips – Wolf Run 69 kV circuits at 139% and 119%. The recommended solution is to convert the Valley substation from 69 kV to 138 kV and re-conductor the Valley – Phillips 138 kV circuit by June 2009. The estimated cost is \$1.125 million for substation conversion and \$2 million for re-conductoring.
28. The tower contingency involving the loss of the Elrama – Wilson and Elrama – General Motors 69 kV circuits results in an overload on the Elrama 138/69 transformer at 140%. The recommended solution is to replace the Elrama 41 MVA transformer with minimum of 75 MVA transformer by June 2009. The estimated cost is \$2.11 million.
29. The single contingency involving the loss of the Dresden 345/138 kV transformer #3 results in an overload on the LaSalle County – Mazon 138 kV circuit at 101% under the 2009 load deliverability test for ComEd zone. The recommended

- solution is to reductor the 3.4 miles of the 0108 circuit with 664.8 ACSS conductor by June 2009. The estimated cost is \$2.125 million.
30. The single contingency involving the loss of the Wolfs – Oswego 138 kV parallel circuit results in an overload on the Wolfs – Oswego 138 kV circuit 14304 at 112% under the 2009 generation deliverability test. The recommended solution is to increase the capacity of the Wolfs – Oswego 138 kV circuit 14304 by June 2009. The estimated cost is \$2.125 million.
 31. The Dixon – McGirr Road 138 kV circuit 10714 is overloaded at 110% pre-contingency under the 2009 load deliverability test for ComEd zone. The recommended solution is to replace small portion of the 10714 circuit and install a 138 kV circuit breaker at Sandwich substation by June 2009. The estimated cost is \$3.725 million.
 32. The single contingency involving the loss of the Elwood – Goodings Grove 345 kV circuit results in an overload on the Dresden 345/138 kV transformer #83 at 102% under the 2009 generation deliverability test. The recommended solution is to install a 345 kV circuit breaker at Elwood substation and change the Elwood 345 kV bus tie to normally close by June 2009. The estimated cost is \$2 million.
 33. The single contingency involving the loss of the Electric Junction – North Aurora 138 kV parallel circuit results in an overload on the Electric Junction – North Aurora circuit 11106 at 107% under the 2009 load deliverability test for ComEd zone. The recommended solution is to reductor 4 miles of the Electric Junction – North Aurora 138 kV circuit by June 2009. The estimated cost is \$4.25 million.
 34. The single contingency involving the loss of Braidwood – Davis 345 kV circuit results in an overload on the East Frankfort 345/138 kV transformer at 101% under the 2009 load deliverability test for ComEd zone. The recommended solution is to normally open the East Frankfort 138 kV red – blue bus tie by June 2009.

Addendum per the presentation at the May 23, 2006 TEAC:

35. Various short circuit violations identified at Loudoun 230 kV substation. The recommended solution is to replace six 230 kV breakers at Loudoun substation by Jun 2009. The cost is estimated at \$2 million.
36. One short circuit violation identified at Yadkin 230 kV substation. The recommended solution is to replace the one 230 kV breaker at Yadkin substation by June 2009. The estimated cost is \$0.5 million.
37. The single contingency involving the loss of the Bells Mill – Quince Orchard 230 kV circuit results in a voltage violation at Bells Mills substation under the 2009 load deliverability test for PEPCO zone. The recommended solution is to install two 100 MVAR capacitors at Bells Mills by June 2009. The estimated cost is \$7.0 million.
38. The single contingency involving the loss of the Electric Junction - North Aurora 138 kV circuit results in an overload on the 11104 Electric Junction – North

- Aurora 138 kV circuit at 102% under the 2009 generation deliverability test. The recommended solution is to reconnector 0.3 miles of the 11104 Electric Junction – North Aurora 138 kV circuit. The estimated cost is \$1.08 million.
39. The N-2 contingency involving the loss of the Lexington –Cloverdale 500 kV circuit, Lexington 500/230 kV and Lexington 230/115 kV transformers results in a voltage drop at Clifton, Lowmoor and Lexington 230 kV buses under the 2009 N-2 test. The recommended solution is to build a new Lexington 230 kV ring bus by June 2009. The estimated cost is \$5.0 million.

Addendum per the presentation at the October 30, 2006 TEAC:

40. The single contingency involving the loss of both Chichester – Linwood 230 kV circuits results in an overload on the Christiana – New Castle 138 kV circuit under the 2009 generation deliverability test. The recommended solution is to upgrade the Christiana – New Castle 138 kV circuit by June 2009. The estimated cost is \$0.25 million.