

First Energy Generator Deactivation Request - January 2012

Deactivation Study Results and Required Upgrades – April 25, 2012

General

PJM received a notice on January 26, 2012 from FirstEnergy of its intent to deactivate through retirement the following generating units by not later than September 1, 2012:

Armstrong 1	172 MW
Armstrong 2	171 MW
Ashtabula 5	244 MW
Bay Shore 2	138 MW
Bay Shore 3	172 MW
Bay Shore 4	215 MW
Eastlake 1	132 MW
Eastlake 2	132 MW
Eastlake 3	132 MW
Eastlake 4	240 MW
Eastlake 5	597 MW
Lake Shore 18	245 MW
R. Paul Smith 3	28 MW
R. Paul Smith 4	87 MW

Reliability Analysis:

PJM Interconnection Analysis (and affected Transmission Owners) performed a study of the Transmission System and found significant reliability concerns resulting from the deactivation of these generating units. In all, more than 190 reliability violations were identified in this deactivation analysis. A summary of the reliability impacts resulting from the proposed Deactivations include:

1. N-1 Common Mode Voltage Violations:

- Ten low voltage violations on the 138 kV system

2. N-1-1 Thermal Violations:

- Six 138 kV thermal violations in the Allegheny Power zone
- Thirty 138 kV and 345kV thermal violations in the ATSI zone
- Two 230 / 115 kV thermal violations (transformers) in the PenElec zone
- Ten 138 kV thermal violations in the AEP zone

3. N-1-1 Voltage Violations:

- Ninety-two low voltage violations in the ATSI zone

4. Generator Deliverability Violations:

- Twenty-six 138 kV and 345 kV overloaded facilities in the ATZI zone.
- One 138 kV overload facility in the Allegheny Power zone.
- Seven 115 kV and 345 kV overloaded facilities in the PenElec zone.
- Eight 345 kV and 138 kV overloads in the AEP zone.

5. Load Deliverability Violations:

- One voltage collapse violation observed in the ATSI zone
- One 345 kV overload on an AEP / ATSI facility

Study Results and Required Upgrades:

The following generating units will be deactivated on September 1, 2012:

Armstrong 1

Armstrong 2

Bay Shore 2

Bay Shore 3

Bay Shore 4

Eastlake 4 Note: will be converted to synchronous condenser (expected completion Dec. 1, 2013)

Eastlake 5 Note: will be converted to synchronous condenser (expected completion June 1, 2013)

R. Paul Smith 3

R. Paul Smith 4

The following generating units will continue to operate as upgrades to the transmission system are constructed:

Ashtabula 5

Eastlake 1

Eastlake 2

Eastlake 3

Lake Shore 18

Required transmission upgrades and expected completion date:

ATSI zone:

- Install a 50 MVAR capacitor bank at the Maclean 138 kV station 6/1/2013
- Install a 345/138 kV transformer at the Inland Q-11 station 6/1/2013
- Install a 138 kV circuit breaker at the Inland Q-11 station 6/1/2013
- Upgrade terminal equipment on the Avon – Crestwood 138 kV line 6/1/2013
- Eastlake unit 5 to be converted to synchronous condenser 6/1/2013
- Eastlake unit 4 to be converted to synchronous condenser 12/1/2013
- Eastlake units 1, 2 and 3 to be converted to synchronous condensers 6/1/2015
- Lakeshore unit 18 to be converted to synchronous condenser 6/1/2015

- Loop the Chamberlin - Mansfield 345 kV line into the Hanna 345 kV substation (existing baseline upgrade b1283) 6/1/2014 (advanced from 6/2015)
- Build new Hayes 345/138 kV substation with new 138 kV lines to: Greenfield #1, Greenfield #2, and Avery (existing baseline upgrade b1281) 6/1/2014 (advanced from 6/2015)
- Build Beaver - Hayes - Davis Besse #2 345 kV line (existing base line upgrade b1282) 6/1/2014 (advanced from 6/2015)
- Re-conductor the Galion – Leaside 138 kV line 6/1/2014
- Re-conductor the Galion – GM Mansfield – Ontario - Cairns 138 kV line 6/1/2014
- Install a 2nd 345/138 kV transformer at the Allen Junction station 6/1/2014
- Install a 2nd 345/138 kV transformer at the Bay Shore station 6/1/2014
- Create a new Northfield Area 345 kV switching station by looping in the Eastlake – Juniper 345 kV line and the Perry - Inland 345 kV line 6/1/2015
- Build a new Mansfield - Northfield Area 345 kV line 6/1/2015
- Create a new Harmon 345/138/69 kV substation by looping in the Star – South Canton 345 kV line 6/1/2015
- Build a new Harmon – Brookside + Harmon - Longview 138 kV line 6/1/2015
- Create a new Five Points Area 345/138 kV substation by looping in the Lemoyne – Midway 345 kV line 6/1/2015
- Install a 50 MVAR capacitor at Hayes 138 kV 6/1/2015
- Install a 138/69 kV transformer at the Avery station 6/1/2015
- Increase design temperature limitation on the Avery – Hayes 138 kV line by raising the existing structures 6/1/2015
- Reconductor Cloverdale - Harmon #2 and #3 138kV lines and Terminal upgrades 6/1/2015
- Change the transformer tap settings on the Maclean 138/69 kV transformers 6/1/2015
- Upgrade the Richland – Naomi 138 kV line 6/1/2015
- ATSI-AEP 138kV Substation on / near territory border and 138kV from new substation to Longview 6/1/2016, working on potential operating procedure to mitigate impacts until this upgrade complete
- Build new Allen Jct - Midway - Lemonye 345kV line 6/1/2016, but operating procedure in place to mitigate impacts until this upgrade complete
- Build a new Leroy Center 345/138 kV substation by looping in the Perry – Harding 345 kV line 6/1/2016, but operating procedure in place to mitigate impacts until this upgrade complete
- Place a portion of the 138 kV Leroy Center 345/138 kV project into service by summer 2015 6/1/2015
- Reconductor the Barberton – West Akron 138 kV line 6/1/2016, but operating procedure in place to mitigate impacts until this upgrade complete

AP zone:

- Replace breaker risers at Marlowe 138 kV and wave traps at Marlowe 138 kV and Bedington 138 kV 6/1/2013
- Replace line trap at Stonewall on the Stephenson 138 kV line terminal (existing base line upgrade b1902) 6/1/2013
- Loop the Homer City-Handsome Lake 345 kV line into the Armstrong substation and install a 345/138 kV transformer at Armstrong 6/1/2014
- Change the CT ratio at Millville 6/1/2015

- Install a new Buckhannon – Weston 138 kV line 6/1/2016, but operating procedure in place to mitigate impacts until this upgrade complete

PenElec zone:

- Construct Four Mile Junction 230/115 kV substation (existing baseline upgrade b1609) 6/1/2014
- Construct a 115 kV ring bus at Claysburg Substation 6/1/2015
- Reconductor Eclipse substation 115 kV bus 6/1/2013
- Install second 230/115 kV autotransformer at Johnstown 6/1/2015

AEP zone:

- Reconductor AEP portion of South Canton – Star 345 kV line and upgrade terminal equipment at South Canton (existing base line upgrade b1812) 12/31/2013
- Advance baseline upgrade b1901 (Rebuild the Ohio Central – West Trinway (4.84 miles) section of the Academia – Ohio Central 138 kV circuit. Upgrade the Ohio Central riser, Ohio Central switch and the West Trinway riser) 6/1/2015
- Advance baseline upgrade b1868 (Perform a sag study on the 05E LIMA – New Liberty 138 kV line) 6/1/2015
- Advance the rebuild portion of the baseline upgrade b1819 (Rebuild the Robinson Park - Sorenson 138 kV line corridor as a 345 kV double circuit line with one side operated at 345 kV and one side at 138 kV) 6/1/2015
- Advance 2016 baseline project b1733 (Perform a sag study of the Bluff Point - Jay 138 kV line.) Upgrade breaker, wavetrap, and risers at the terminal ends). 12/1/2014
- Perform a sag study on the Brues – West Bellaire 138 kV line 12/1/2014
- Advance Baseline project b1865 (Perform a Sag study on the Kanawha – Carbondale 138 KV line) 12/1/2014
- Sag study of the Dequine - Meadowlake 345 kV line #1 12/1/2013
- Sag study of the Dequine - Meadowlake 345 kV line #2 12/1/2013
- Advance baseline project b1868 (Perform sag study of the East Lima – New Liberty 138kV line) 12/1/2014
- Establish a new 765/345 interconnection at Sporn. Install a 765/345 kV transformer at Mountaineer and build ¾ mile of 345 kV to Sporn. 6/1/2015
- Perform a sag study on the Grant Tap – Deer Creek 138 kV line and replace bus and risers at Deer Creek station 12/1/2014
- Advance baseline project b1436 (Perform a sag study on the Sorenson - Illinois Road 138kV line). Replace bus and risers at Illinois Road. 12/1/2014
- Perform a sag study on the Kammer – Ormet 138 kV line 12/1/2012
- Perform a sag study of the Maddox- Convoy 345 kV line 12/1/2013
- Perform a sag study of the Maddox – T130 345 kV line 12/1/2013
- Perform a sag study of the Meadowlake - Olive 345 kV 12/1/2013
- Perform a sag study on the Milan - Harper 138 kV line and replace bus and switches at Milan Switch station 12/1/2014
- Advance baseline project b1871 (Perform a sag study on the Ohio Central – West Coshocton 138KV line). 12/1/2014
- Perform a sag study of the R-049 - Tillma 138 kV line 12/1/2013
- Advance 2016 Baseline project B1734 (Perform a sag study of Randolph - Hodgins 138 kV line. Upgrade terminal equipment). 12/1/2014

- South Canton – Harmon 345 kV line - advance baseline project b1812 (rebuild AEP portion of line). Also upgrades risers, wavetrap and bus work at South Canton station. 6/1/2015
- Perform a sag study of the Tillma - Dawkins 138 kV line 12/1/2013
- Advance baseline project b1738 (Perform a sag study of the Wolf Creek - Layman 138 kV line. Upgrade terminal equipment including a 138 kV breaker and wavetrap). 12/1/2014
- Advance baseline project b1883 (Switch the breaker position of transformer #1 and SW Lima at East Lima 345 kV bus). 12/1/2014
- Terminate Transformer #2 at SW Lima in a bay position 12/1/2014
- Perform a sag study on the Brookside - Howard 138 kV line and replace bus and risers at AEP Howard station 12/1/2014

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

8/16/2012 1:28:31 PM

in

Case No(s). 12-0504-EL-FOR

Summary: Correspondence Supplement to the Ohio Edison Company, The Cleveland Electric Illuminating Company, The Toledo Edison Company and American Transmissions Systems, Inc. 2012 Electric Long-Term forecast report Part 5 of 11 - Attachment J electronically filed by Karen A Sweeney on behalf of Ohio Edison Company and The Cleveland Electric Illuminating Company and The Toledo Edison Company and American Transmissions Systems, Inc. and Eberts, Bradley D. Mr.