Reliability Analysis Update
NERC Category B Violation

Problem:
- For loss of Line #69 segment (Locks – Reams 115kV DP), opening switch #6976 at Reams and closing switch 69T148 at Purdy results in Line #148 (Clubhouse – Purdy 115kV) exceeding 94% of its summer rating of 41 MVA.
- On line #148 4 spans have insufficient ground clearance and 16 wood H frames are in poor condition

Proposed Solution:
- LIDAR survey shows that Line #148 (795 ACSR conductor) can be re-rated from 50C to 75C with a summer rating of 161 MVA.
- Replace 24 115kV wood H-frames with 230kV Dominion-pole H-frame structures.

Estimated Cost: $ 2.9M
Projected IS Date: 6/1/2014
NERC Category B violation

Project B1504 Update

Problem:
- By summer 2013, the N-1 contingency loss of NOVEC’s 115 kV transmission circuit #923 will result in an overload of Dominion’s Line #134 (Bull Run-Harrison 115 kV DP) while trying to restore load. Additionally, normal loading on Line #134 (radial) is above 100 MW

Proposed Solution:
- Re-build Lines #134 and #163 for higher capacity, approximately 0.5 miles from Bull Run Substation to Harrison DP
- Install a tie-switch between the lines at Harrison DP
- **UPDATE:** The rebuild of Lines #134 and #163 (b1504.1), to resolve the thermal issues, was completed on time by summer 2013. Installation of the tie-switch (b1504.2) was initially delayed to fall 2014 due to permitting issues. The tie-switch installation has been further delayed to fall 2015 due to operational considerations associated with construction of the Cloverhill-Liberty 230kV. Mitigation of load on Line #134 will be accomplished via internal switching on the NOVEC system.

Estimated cost $3 M
- $2.3M cost-to-date (as of 01/28/2014)
- $0.4M estimated cost remaining

Projected IS Date: Nov. 2015 (revised)
Region with thermal issues

NERC Category B Violation

Project b1793 Update

Problem:
- In 2016 an outage of the Line #90 (Kerr Dam – Carolina 115kV) breaker at Kerr overloads Line #22 (Eatons Ferry – Carolina 115kV) by 1.8% (No Surry 230 kV generation)

Proposed Solution –
- Wreck and rebuild remaining section of Line #22, 19.5 miles and replace two pole H frame construction built in 1930.

Proposed addition to solution –
- The Carolina 22 SPS prevents overload of Line #22 for loss of Line #90. After this project is complete, the Carolina 22 SPS will no longer be needed. Remove the Carolina 22 SPS to include relay logic changes, minor control wiring, relay resets and SCADA programming.

Estimated Cost $ 25.0 M
Estimated Additional Cost $25.0 K

Projected IS Date May 2016
Region with thermal issues

NERC Category B Violation

Project b1795 Update

Line #54 Uprate

Problem:
• In 2016 an outage of Line #2012 (Roanoke Valley NUG to Earleys 230 kV) overloads a segment of Line #54 (Carolina to Woodland 115 kV) by 3% (No Surry 230 kV Generation)
Line #54 Uprate

- Proposed Solution
  Reconductor segment of Line #54 (Carolina to Woodland) to a minimum of 300 MVA. Most of the 27 miles of line are on the same structures with Line # 2012. Preliminary Engineering review indicates that the structures will not need to be replaced due to the reconductoring.

- Proposed Revised Solution
  Further engineering review has shown that the existing 336 ACSR sagged at 90°C can be uprated to a sag of 150°C by replacing 12 wood H-frame structures with steel H-frame structures and installing shunts on all conductor splices. All line switches and substation components at Carolina will be upgraded to meet or exceed the new conductor rating. This will increase the line rating from 118 MVA to 174 MVA. Replace 14 wood H-frame structures with steel H-frame structures that are in the same line section. These 14 structures are being replaced due to poor condition, mostly in a swampy area and while the mats are in place. Replace 2.5 miles of static wire.

- Proposed Addition to Solution –
  The Carolina 54 SPS prevents overload of Line #54 for loss of Line # 2012. After this project is complete, the Carolina 54 SPS will no longer be needed. Remove the Carolina 54 SPS to include relay logic changes, minor control wiring, relay resets and SCADA programming.

- Previous Estimated Cost  $ 18.0 M
- Revised Estimated Cost  $ 4.9 M (includes $25,000 for SPS removal)

- Projected IS Date: May 2016
Supplemental Projects
West Landing 230 kV Sub 2nd DP

Solution:
- West Landing is tapped of line #2085 (Landstown to West Landing 230 kV).
- Install circuit switcher and 230 kV bus work at West Landing to connect the new 230/34.5 kV transformer.

Estimated Project Cost: $420 K.

Potential IS Date: 06/01/2014
South Norfolk 230 kV Sub 2nd DP

Solution:

- South Norfolk is tapped of line #279 (Reeves Avenue to Thrasher 230 kV).
- Install additional backbones and line switches at South Norfolk substation to support the new 230/13.2 kV transformer.

Estimated Project Cost: $740 K.

Potential IS Date: 06/01/2014