

Table 3-1. Alternatives that will address 2021 NERC Reliability Violations

| | | Surry -Skiffes 500 kV (proposed project) | Chickahominy-Skiffes Creek 500 kV | Underground 230 kV Single Circuit + Retrofit Generation | Underground 230 kV Double Circuit + Retrofit Generation | Line 214/263 230 kV Rebuild (James River Bridge Crossing) + Retrofit Generation | New Generation | Surry - Whealton 500kV | Surry - Skiffes Creek 500 kV Underground (HVDC) |
|---|---|---|--|--|--|---|---|--|--|
| Alternative Available and Capable to Meet Overall Project Purpose ¹ | Cost | Y (\$178.7M) | N - (\$265.1M) | N - (\$1,803.89M) ⁵ | N - (\$1,100.46M) ⁵ | N - (\$1,048.02) ⁵ | N - (\$715.00M) | Cost not evaluated | N - (\$700M - \$1,000M) ⁶ |
| | Logistics ³ | Y - 13 months for construction | N - 51 months for approvals and construction | N - 96 months for approvals and construction | N - 96 months for approvals and construction | N - 156 months for approvals and construction | N - 72 months for approvals and construction, 2. Fuel supply issues for natural gas, 3. Potential Siting Issues | N - Not constructible due to route alignment and the inability to obtain the necessary ROW to Whealton Substation. | N - 1. 96-120 months for approvals and construction, ⁶ 2. Space availability issues for converter station |
| | Section in Alternatives Analysis | 4.0 | 3.2.3.5 | 3.3.1 and 3.2.1 | 3.3.1 and 3.2.1 | 3.2.3.1 and 3.2.1 | 3.2.1 | 3.2.3.3 | 3.3.3 |
| Practicable? | | Y | N | N | N | N | N | N | N |
| Environmental Impacts ² | Tidal Wetlands | 1.20 ac crossed 0 ac impact | 8.64 ac crossed <0.1 ac impact | 1.20 ac crossed 0 ac impact | 1.20 ac crossed 0 ac impact | Temp impact | Potential impact | 5 ac crossed <0.1 ac impact | Potential impact |
| | PFO Wetland Conversion | 0.41 ac | 62.00 ac | 0.73 ac | 0.73 ac | Likely 0 ac | Potential impact | Potential impact | Potential impact |
| | River Crossing | New James River aerial | New Chickahominy River aerial | New James River underground | New James River underground | Existing James River aerial rebuild | None likely | New James River aerial at existing aerial | New James River underground |
| | Subaqueous Bottom Encroachment | 0.63 ac | <0.1 ac | Direct impacts required | Direct impacts required | Impacts unlikely | Minimum impact | Minimal impacts similar to proposed | Considerable impacts |
| | Direct Oyster Lease Impacts | <0.25 ac | 0 ac | Direct impacts likely | Direct impacts likely | Impacts unlikely | Minimum impact | 10 leases present, similar impacts to proposed project | Considerable impact |
| | Water Quality Impacts | Minimal w/ E&S controls | Minimal w/ E&S controls | Turbidity, release of contaminants | Turbidity, release of contaminants | Minimal w/ E&S controls | Minimal w/ E&S controls | Minimal w/ E&S controls | Turbidity, release of contaminants |
| | Protected Species Impacts ⁴ | Not likely to adversely affect | Potential impacts to SWP, SJV, bald eagle | Potential impacts to Atlantic sturgeon | Potential impacts to Atlantic sturgeon | Not likely to adversely affect | Unknown | Not likely to adversely affect | Potential impacts to Atlantic sturgeon |
| | Potential for Visual Effects to Architectural Resources | Effects to resources on James River | Potential effects to resources along new ROW | Potential visual effects from onshore towers (0.8 mi from Carters Grove) | Potential visual effects from onshore towers (0.8 mi from Carters Grove) | Little change to existing visual effects | Potential effects | Little change to existing visual effects | Large (5-8 story) converter stations on both sides of James River |
| | Archaeological Sites w/in ROW | 7 | 68 | Similar to proposed project | Similar to proposed project | Unknown but existing ROW | Unknown | Unknown | Unknown for converter station |
| | Underwater Archaeological Sites w/in ROW | 6 all avoided by towers | Unknown | Similar to proposed project but may be directly impacted | Similar to proposed project but may be directly impacted | Unknown but existing crossing | Unlikely to affect | Unknown but existing crossing | Similar to proposed project but may be directly impacted |
| | Homes w/in 500' of ROW | 84 | 1,129 | 84 | 84 | No new ROW required | Unknown - New generation and pipeline would likely affect some homes | Many homes within ROW/switching station expansion | 84 |
| Substantial Additional Projects Required to Address 2021 NERC Reliability Violations? | N | N | Y | Y | Y | Y | N/A | N | |

1. Overall Purpose: To provide reliable, cost-effective bulk electric power delivery to the NHRLA to maintain compliance with NERC reliability standards. All alternatives presented here deemed to be technically available and capable of being implemented without regard to schedule.

2. Environmental impacts only need be evaluated for alternatives deemed practicable; however, environmental impacts are provided for all alternatives for comparison.

3. No alternatives except the proposed project could replace the power lost due to the retirement of Yorktown Units 1 and 2 by April 2016 or April 2017, even if EPA would issue a 5th year extension for compliance with the MATS rule.

4. SWP = small whorled pogonia, SJV = sensitive joint vetch. Effects to federally threatened or endangered species or disturbance to bald eagles has not been evaluated by the USFWS or NOAA for any alternatives except the proposed project.

5. In addition to the Mercury and Air Toxics Standards (MATS) promulgated by EPA, there are other major EPA rules that make retrofit of Yorktown Units 1 and 2 not a viable option. The EPA 316(b) Cooling Water Intake Structures Rule became effective on October 14, 2014. Additional investment in technologies to reduce impingement and entrainment impacts would be required by the rule. Another recent final rule is the Coal Ash Rule (CCR), which was signed by EPA on December 19, 2014. This Rule will result in increased long-term cost for coal ash management at the Yorktown coal ash landfill. On November 26, 2014, EPA announced a proposed rule to reduce the National Ambient Air Quality Standards for ground-level ozone from 75 parts per billion (ppb) to a range of 65 ppb to 70 ppb. This creates additional uncertainty concerning the viability of Yorktown Units 1 and 2 without the installation of additional controls. Costs for compliance with these rules is not included in the cost estimate for retrofits.

Probably the most significant proposed EPA Rule recently proposed for the electric utility industry is the Clean Power Rule. The comment period on the proposed rule closed on December first. The rule is expected become final in summer 2015 and state implementation plans are expected to be due to EPA in summer of 2016. This Rule establishes specific CO₂ emission rate targets in lbs CO₂/net MW hr for each state. Virginia will be required to reduce its statewide CO₂ emission rate from fossil fuel-fired generating units by 38 percent under the current draft. If the rule is not significantly amended prior to being finalized, Dominion may need to close additional coal fired units beyond these units and others planned for the fleet.

6. The estimates for HVDC alternative were derived from data on other completed HVDC projects that are vaguely similar of scope. We have taken a conservative approach in estimating the cost and duration for this alternative such not to over state the cost or duration. However, because of projects of these type are unique in their complexity, the only true and accurate estimation for cost and duration can only be done through a thorough engineering scoping design which would take 12-18 months to complete.