

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 CO ₂ emission rate targets in lbs CO ₂ /net MW hr for each state. Virginia will be required to reduce its statewide CO ₂ 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.