TAG Meeting
September 12, 2016

Webinar

TAG Meeting Agenda

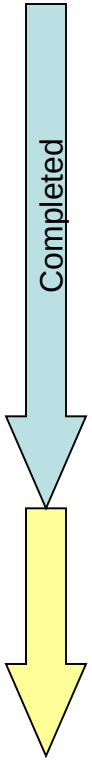
1. Administrative Items – Rich Wodyka
2. 2016 Study Activities Update – Orvane Piper
3. Discussion on Operating Guides – Mark Byrd and Orvane Piper
4. Regional Studies Update – Bob Pierce
5. 2016 TAG Work Plan Update – Rich Wodyka
6. TAG Open Forum – Rich Wodyka

2016 Study Activities Update

Orvane Piper

Duke Energy Carolinas

Steps and Status of the Study Process



1. Assumptions Selected
2. Study Criteria Established
3. Study Methodologies Selected
4. Models and Cases Developed
5. Technical Analysis Performed
6. Problems Identified and Solutions Developed
7. Collaborative Plan Projects Selected
8. Study Report Prepared

Problems Identified and Solutions Developed

- Identify limitations and develop potential alternative solutions for further testing and evaluation
- Estimate project costs and schedule

Sensitivity #2

- **Identification of permanent transmission upgrades to eliminate use of specific operating procedures / guides**
  - **Study year 2026 Summer**
  - **1 DEC/DEP operating procedure**
  - **4 DEP operating procedures**

Projects To Replace Identified Operating Procedures / Guides	
Project	**TO**
Install Series Reactors on Wateree-Great Falls 100 kV	**DEC**
Reconductor Rockingham-West End 230 kV	**DEP**
Reconductor Marion-Dillon Tap 115 kV	**DEP**

2021 (% Loading)							Overloaded Branch	
21S	Br1Dn	HarDn	Rob2Dn	21W	AshvDn	Comments	Name	Branch Type
96.6	93.7	94.8	92.5	---	107	Operating Guide	BADIN - TUCKERTOWN	100 kV Line
---	---	---	---	110.2	106.1	Upgrade 6.3 miles	BOGER CITY BL	100 kV Line
---	---	---	---	100	100.1	Upgrade 6.3 miles	BOGER CITY WH	100 kV Line
---	---	---	---	---	91.5	N/A, outside 10 year plan	DAVIDSON RIVER BL	100 kV Line
---	---	---	---	94.5	108.1	upgrade 4.7 miles (<$10 M)	DAVIDSON RIVER BL	100 kV Line
---	---	---	---	---	95.5	AEU	DAVIDSON RIVER WH	100 kV Line
94.5	94.7	94.7	94.7	---	---	Tarrant Rd SS (<$10 M)	DEEP RIVER WH	100 kV Line
94.2	---	---	---	---	---	Upgrade 13.9 miles	DUNCAN WH N	100 kV Line
---	---	---	---	101.7	104.4	Upgrade 11.8 miles	HARLEY BL	100 kV Line
---	---	---	---	101.8	104.3	Upgrade 11.8 miles	HARLEY BL	100 kV Line
---	---	---	---	109.9	115.2	Upgrade 11.8 miles	HARLEY WH	100 kV Line
108.6	105.3	106.6	104	---	120.3	Operating Guide	HIGH ROCK - TUCKERTOWN	100 kV Line
---	---	---	---	---	91.6	N/A, outside 10 year plan	HOGBACK BL	100 kV Line
---	---	---	---	---	93.2	N/A, outside 10 year plan	HOGBACK WH	100 kV Line
93.3	97.5	98.4	96.7	---	---	Upgrade 9.8 miles	LINDEN ST BL	100 kV Line
---	94.8	95.7	94	---	---	Upgrade 9.8 miles	LINDEN ST WH	100 kV Line
---	94.7	95.6	93.9	---	---	Upgrade 3.2 miles	LINDEN ST WH	100 kV Line
---	95	95.8	---	---	---	Upgrade 9.7 miles	PIEDMONT BL	100 kV Line
113.9	113.8	113.8	113.8	---	---	Operating Guide	WATEREE BL	100 kV Line
113.9	113.9	113.9	113.9	---	---	Operating Guide	WATEREE WH	100 kV Line
98.3	98.4	98.6	98.4	---	---	Springfield SS (<$10 M)	WEDDINGTON BL	100 kV Line
98.3	98.6	98.6	98.6	---	---	Springfield SS (<$10 M)	WEDDINGTON BL	100 kV Line
---	---	---	---	106.1	100.3	DEP proposed project	PISGAH TIE 09	115/100 kV Transformer
---	---	---	---	106.6	100.8	DEP proposed project	PISGAH TIE 10	115/100 kV Transformer
90.9	---	---	---	---	---	N/A, outside 10 year plan	FISHER BL	230 kV Line
90.9	---	---	---	---	---	N/A, outside 10 year plan	FISHER WH	230 kV Line
101.7	92.4	91.7	93.6	---	---	Operating Guide	LONDON CREEK BL	230 kV Line
101.7	92.4	91.7	93.6	---	---	Operating Guide	LONDON CREEK WH	230 kV Line
92.1	---	---	---	---	---	N/A, outside 10 year plan	SADLER BL	230 kV Line
92.1	---	---	---	---	---	N/A, outside 10 year plan	SADLER WH	230 kV Line
---	93.2	93.6	92.7	---	---	add second 230 kV circuit (<$10 M)	SANDY RIDGE BL	230 kV Line
---	---	---	---	95.3	---	AEU	STAMEY BL	230 kV Line
95.1	---	---	---	---	---	AEU	ALLEN 2B	230/100 kV Transformer
93.2	---	---	---	---	---	N/A, outside 10 year plan	ALLEN STEAM PL 06	230/100 kV Transformer
---	---	---	---	109.8	102.5	AEU	PISGAH TIE 01	230/100/44 kV Transformer
---	---	---	---	107.1	100.1	AEU	PISGAH TIE 02	230/100/44 kV Transformer
104.7	---	---	---	---	---	add transformer (<$10 M)	SADLER TIE 03	230/100/44 kV Transformer
109.3	---	---	---	98.9	---	add transformer (<$10 M)	SADLER TIE 04	230/100/44 kV Transformer
94.5	90.3	90.7	---	---	---	AEU	STONEWATER TIE A4	230/100/44 kV Transformer
94.4	90.3	90.7	---	---	---	AEU	STONEWATER TIE A5	230/100/44 kV Transformer
98.9	91.9	91.8	91.7	91.5	---	AEU	KATOMA	500 kV Line
---	---	91.2	---	---	---	N/A, outside 10 year plan	PARKWOOD TIE 05	500/230 kV Transformer

2026 (% Loading)					Overloaded Branch	
26S	26S_Br1Dn	26S_HarDn	26S_Rob2Dn	Comments	Name	Branch Type
105	99.6	101	---	Operating Guide	BADIN - TUCKERTOWN	100 kV Line
101.4	101.6	101.6	101.5	Tarrant Rd SS (<$10 M)	DEEP RIVER WH	100 kV Line
113.9	112.2	111.5	113.4	Upgrade 13.9 miles	DUNCAN WH N	100 kV Line
118.1	112	113.6	110.2	Operating Guide	HIGH ROCK - TUCKERTOWN	100 kV Line
---	---	---	---	N/A, outside 10 year plan	LINDEN ST BL	100 kV Line
114	113.9	113.9	113.9	Operating Guide	WATEREE BL	100 kV Line
114	113.9	113.9	113.9	Operating Guide	WATEREE WH	100 kV Line
106.1	106.3	106.3	106.2	Springfield SS (<$10 M)	WEDDINGTON BL	100 kV Line
106.8	107.1	107.1	107	Springfield SS (<$10 M)	WEDDINGTON BL	100 kV Line
---	---	---	---	N/A, outside 10 year plan	CLAY HILL BL	230 kV Line
---	---	---	---	N/A, outside 10 year plan	HARRISBURG BL	230 kV Line
---	---	---	---	N/A, outside 10 year plan	HARRISBURG WH	230 kV Line
125.7	125.9	125.2	127.1	Operating Guide	LONDON CREEK BL	230 kV Line
125.7	125.9	125.2	127.1	Operating Guide	LONDON CREEK WH	230 kV Line
95.3	---	---	---	N/A, outside 10 year plan	RIPP BL	230 kV Line
95.3	---	---	---	N/A, outside 10 year plan	RIPP WH	230 kV Line
---	96.3	96.7	95.7	N/A, outside 10 year plan	SANDY RIDGE BL	230 kV Line
---	92.6	93	92.8	N/A, outside 10 year plan	STEELBERRY BL	230 kV Line
---	92.6	93	92.8	N/A, outside 10 year plan	STEELBERRY WH	230 kV Line
---	92.8	94.1	91.9	N/A, outside 10 year plan	WESTPORT WH	230 kV Line
---	90	94.1	94.5	N/A, outside 10 year plan	ALLEN 2B	230/100 kV Transformer
96	90.4	90.2	90.4	N/A, outside 10 year plan	BECKERDITE TIE 02	230/100 kV Transformer
96.5	90.9	90.7	90.8	N/A, outside 10 year plan	BECKERDITE TIE 03	230/100 kV Transformer
---	90.4	90.3	90.5	N/A, outside 10 year plan	BUCK TIE AT3	230/100 kV Transformer
---	90.4	90.3	90.5	N/A, outside 10 year plan	BUCK TIE AT4	230/100 kV Transformer
106.4	---	---	---	add transformer (<$10 M)	SADLER TIE 03	230/100/44 kV Transformer
111	---	---	---	add transformer (<$10 M)	SADLER TIE 04	230/100/44 kV Transformer
102.5	98.3	98.6	97.9	AEU	STONEWATER TIE A4	230/100/44 kV Transformer
---	---	91	90.3	N/A, outside 10 year plan	STONEWATER TIE A4	230/100/44 kV Transformer
102.4	98.2	98.6	97.9	AEU	STONEWATER TIE A5	230/100/44 kV Transformer
---	---	91.1	90.3	N/A, outside 10 year plan	STONEWATER TIE A5	230/100/44 kV Transformer
97.3	---	---	---	N/A, outside 10 year plan	KATOMA	500 kV Line
---	93.5	95.8	90.8	N/A, outside 10 year plan	PARKWOOD TIE 05	500/230 kV Transformer

2026 (% Loading)								Overloaded Branch	
Brunswick	Brunswick_HarDn	Brunswick_Rob2Dn	OpGuides	OpGuides_Br1Dn	OpGuides_HarDn	OpGuides_Rob2Dn	Comments	Name	Branch Type
99.9	100.3	---	103	---	---	---	Operating Guide	BADIN - TUCKERTOWN	100 kV Line
101.5	101.6	97.4	101.4	97.3	97.5	97.1	Tarrant Rd SS (<$10 M)	DEEP RIVER WH	100 kV Line
106.2	111.6	103.6	113.6	110.2	109.6	111.1	Upgrade 13.9 miles	DUNCAN WH N	100 kV Line
112.3	112.8	101.6	115.8	99.1	100	97.8	Operating Guide	HIGH ROCK - TUCKERTOWN	100 kV Line
100	100	101.8	---	---	---	---	Upgrade 9.8 miles	LINDEN ST BL	100 kV Line
114	113.9	114.4	---	---	---	---	Operating Guide	WATEREE BL	100 kV Line
114	113.9	114.4	---	---	---	---	Operating Guide	WATEREE WH	100 kV Line
106.4	106.4	101.7	106.1	101.3	101.4	101.2	Springfield SS (<$10 M)	WEDDINGTON BL	100 kV Line
107.2	107.1	102.5	106.8	102	102.1	101.9	Springfield SS (<$10 M)	WEDDINGTON BL	100 kV Line
96.6	---	98.8	---	95.7	95.7	95.7	Upgrade 24.5 miles	CLAY HILL BL	230 kV Line
---	---	99.2	---	---	---	---	Upgrade 21.7 miles	HARRISBURG BL	230 kV Line
---	---	99.2	---	---	---	---	Upgrade 21.7 miles	HARRISBURG WH	230 kV Line
118.9	125.3	116.3	125.4	121.6	121.1	122.6	Operating Guide	LONDON CREEK BL	230 kV Line
118.9	125.3	116.3	125.4	121.6	121.1	122.6	Operating Guide	LONDON CREEK WH	230 kV Line
---	---	---	95.3	---	---	---	N/A, outside 10 year plan	RIPP BL	230 kV Line
---	---	---	95.3	---	---	---	N/A, outside 10 year plan	RIPP WH	230 kV Line
98.1	96.7	99.3	---	95.3	95.7	94.7	N/A, outside 10 year plan	SANDY RIDGE BL	230 kV Line
96.4	---	---	---	---	---	---	N/A, outside 10 year plan	STEELBERRY BL	230 kV Line
96.4	---	---	---	---	---	---	N/A, outside 10 year plan	STEELBERRY WH	230 kV Line
---	---	---	---	---	---	---	N/A, outside 10 year plan	WESTPORT WH	230 kV Line
---	---	---	---	---	---	---	N/A, outside 10 year plan	ALLEN 2B	230/100 kV Transformer
---	---	---	96	---	---	---	N/A, outside 10 year plan	BECKERDITE TIE 02	230/100 kV Transformer
---	---	---	96.5	---	---	---	N/A, outside 10 year plan	BECKERDITE TIE 03	230/100 kV Transformer
---	---	---	---	---	---	---	N/A, outside 10 year plan	BUCK TIE AT3	230/100 kV Transformer
---	---	---	---	---	---	---	N/A, outside 10 year plan	BUCK TIE AT4	230/100 kV Transformer
107.2	---	---	106.4	---	---	---	add transformer (<$10 M)	SADLER TIE 03	230/100/44 kV Transformer
111.8	---	---	111	---	---	---	add transformer (<$10 M)	SADLER TIE 04	230/100/44 kV Transformer
104.2	98.7	95.1	102.5	---	94.9	---	AEU	STONEWATER TIE A4	230/100/44 kV Transformer
---	---	---	---	---	---	---	N/A, outside 10 year plan	STONEWATER TIE A4	230/100/44 kV Transformer
104.1	98.6	95.1	102.4	---	94.9	---	AEU	STONEWATER TIE A5	230/100/44 kV Transformer
---	---	---	---	---	---	---	N/A, outside 10 year plan	STONEWATER TIE A5	230/100/44 kV Transformer
95.9	---	---	97.3	---	---	---	N/A, outside 10 year plan	KATOMA	500 kV Line
96.2	96	95.3	---	---	---	---	N/A, outside 10 year plan	PARKWOOD TIE 05	500/230 kV Transformer

21S Base Reliabilty Study %Loading					
Base Case	Br1DnTRM	HarDnTRM	Rob2DnTRM	Notes	Monitored Facility
----	99.57	----	----	Proposed Project	PILKINGTON LIBBEY-OWENS-FORD-BUTLER TAP 115 kV LINE
----	98.17	----	----	Proposed Project	MAXTON-BUTLER TAP 115 kV LINE
93.20	----	92.11	----	Beyond 10-Year Planning Horizon	VISTA-CASTLE HAYNE 115 kV LINE
----	----	----	94.57	Beyond 10-Year Planning Horizon	EASTOVER-SHAW AFB TAB 115 kV LINE
----	----	----	90.50	Beyond 10-Year Planning Horizon	CAMDEN TAP-CAMDEN CITY 115 KV LINE
----	92.86	92.11	104.48	Operating Procedure	CAMDEN-CAMDEN TAP 115 kV LINE
----	90.70	----	101.71	Operating Procedure	CAMDEN-INDUSTRIAL CUSTOMER 115 kV LINE

21/22W Base Reliability %Loading			
Base Case	AshvCT1DnTRM	Notes	Monitored Facility
90.98	116.04	Operating Procedure	PISGAH-CRADLE OF FORESTRY 115 kV LINE
----	96.97	Operating Procedure	CANTON-CRADLE OF FORESTRY 115 kV LINE
97.79	N/A	Proposed Project	MAXTON-BUTLER TAP 115 kV LINE

26S Base Reliabilty Study %Loading

Base Case	Br1DnTRM	HarDnTRM	Rob2DnTRM	Notes	Monitored Facility
----	----	----	----	Beyond 10-Year Planning Horizon	SUTTON-CASTLE HAYNE 230 kV LINE
----	90.33	----	----	Beyond 10-Year Planning Horizon	SUTTON-WILMINGTON NINTH & ORANGE 230 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	WEATHERSPOON-WEST LUMBERTON 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	CAPE FEAR SOUTH-LILLINGTON 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	DARLINGTON COUNTY-S BETHUNE 230 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	RALEIGH BRIERS CREEK-DURHAM 230 kV LINE
94.26	94.58	95.04	94.33	Beyond 10-Year Planning Horizon	CHESTNUT HILLS-MILBURNIE 115 kV LINE
----	----	91.05	----	Beyond 10-Year Planning Horizon	ROCKINGHAM-WADESBORO TAP 230 kV LINE
----	----	----	----	*Ancillary Equipment Upgrade	CUMBERLAND-GARLAND 230 kV LINE
----	98.49	----	----	Proposed Project	PILKINGTON LIBBEY-OWENS-FORD-BUTLER TAP 115 kV LINE
----	----	----	----	Proposed Project	MAXTON-PEMBROKE 115 kV LINE
----	96.99	----	----	Proposed Project	MAXTON-BUTLER TAP 115 kV LINE
97.67	----	96.56	92.61	Beyond 10-Year Planning Horizon	VISTA-CASTLE HAYNE 115 kV LINE
91.22	----	90.12	----	Beyond 10-Year Planning Horizon	VISTA-JONES-ONSLOW EMC HUGH BATTS 115 kV LINE
98.21	98.90	98.33	98.29	*Ancillary Equipment Upgrade & Raise 9.89 Miles	LELAND INDUSTRIAL-DELCO 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	LAKE WACCAMAW-HALLSBORO 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	HALLSBORO-WHITEVILLE TAP 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	NICHOLS-MULLINS 115 kV LINE
----	----	----	----	*Reconductor 8.65 Miles w/3-1590	MULLINS-MARION 115 kV LINE
----	----	----	----	Operating Procedure	MARION-DILLON TAP 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	SUMTER-SUMTER GOLD KIST TAP 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	KINGS HIGHWAY-SUMTER GOLD KIST TAP 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	KINGS HIGHWAY-SHAW AFB TAP 115 kV LINE
----	----	----	94.42	*Coordinate w/SCEG - Reconductor 7.37 Miles w/3-795	EASTOVER-SHAW AFB TAP 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	SUMTER-WATEREE 230 kV LINE
----	----	----	91.53	Operating Procedure	CAMDEN TAP-CAMDEN CITY 115 kV LINE
----	94.67	93.91	106.36	Operating Procedure	CAMDEN-CAMDEN TAP 115 kV LINE
----	92.42	91.69	103.49	Operating Procedure	CAMDEN-INDUSTRIAL CUSTOMER 115 kV LINE
----	----	----	----	Beyond 10-Year Planning Horizon	INDUSTRIAL CUSTOMER-ELGIN TAP 115 kV LINE
					Bus Differential Relay Failure (P-5)
98.85	N/A	N/A	N/A	Beyond 10-Year Planning Horizon	WEATHERSPOON-WEST LUMBERTON 115 kV LINE
96.21	N/A	N/A	N/A	Beyond 10-Year Planning Horizon	SUTTON-WILMINGTON PCS 115 kV LINE
					Internal Breaker Fault (P-2)
96.33	N/A	N/A	N/A	Beyond 10-Year Planning Horizon	SUTTON-WILMINGTON PCS 115 kV LINE
				*Hypothetical Projects	

26S_Br1&2Dn Study %Loading			26S_Operating Guides Study %Loading					
Base Case	HarDnTRM	Rob2DnTRM	Base Case	Br1DnTRM	HarDnTRM	Rob2DnTRM	Notes	Monitored Facility
92.06	----	----	----	----	----	----	Beyond 10-Year Planning Horizon	SUTTON-CASTLE HAYNE 230 kV LINE
----	----	----	----	90.29	----	----	Beyond 10-Year Planning Horizon	SUTTON-WILMINGTON NINTH & ORANGE 230 kV LINE
----	91.13	90.68	----	----	----	----	Beyond 10-Year Planning Horizon	WEATHERSPOON-WEST LUMBERTON 115 kV LINE
----	----	93.77	----	----	----	----	Beyond 10-Year Planning Horizon	CAPE FEAR SOUTH-LILLINGTON 115 kV LINE
----	----	98.84	----	----	----	----	Beyond 10-Year Planning Horizon	DARLINGTON COUNTY-S BETHUNE 230 kV LINE
----	92.77	----	----	----	----	----	Beyond 10-Year Planning Horizon	RALEIGH BRIERS CREEK-DURHAM 230 kV LINE
94.81	95.84	94.97	94.26	94.48	94.93	94.27	Beyond 10-Year Planning Horizon	CHESTNUT HILLS-MILBURNIE 115 kV LINE
----	92.52	----	----	----	----	----	Beyond 10-Year Planning Horizon	ROCKINGHAM-WADESBORO TAP 230 kV LINE
94.31	99.74	101.10	----	----	----	----	*Ancillary Equipment Upgrade	CUMBERLAND-GARLAND 230 kV LINE
110.25	116.08	111.29	----	97.82	----	----	Proposed Project	PILKINGTON LIBBEY-OWENS-FORD-BUTLER TAP 115 kV LINE
98.63	104.07	99.26	----	----	----	----	Proposed Project	MAXTON-PEMBROKE 115 kV LINE
108.75	114.57	109.78	----	96.32	----	----	Proposed Project	MAXTON-BUTLER TAP 115 kV LINE
----	----	----	97.63	----	96.41	92.58	Beyond 10-Year Planning Horizon	VISTA-CASTLE HAYNE 115 kV LINE
----	----	----	91.18	----	----	----	Beyond 10-Year Planning Horizon	VISTA-JONES-ONSLOW EMC HUGH BATTS 115 kV LINE
99.75	100.46	100.07	98.21	98.87	98.31	98.30	*Ancillary Equipment Upgrade & Raise 9.89 Miles	LELAND INDUSTRIAL-DELCO 115 kV LINE
----	91.62	----	----	----	----	----	Beyond 10-Year Planning Horizon	LAKE WACCAMAW-HALLSBORO 115 kV LINE
----	93.79	----	----	----	----	----	Beyond 10-Year Planning Horizon	HALLSBORO-WHITEVILLE TAP 115 kV LINE
----	91.02	----	----	----	----	----	Beyond 10-Year Planning Horizon	NICHOLS-MULLINS 115 kV LINE
93.37	105.90	96.05	----	----	----	----	*Reconductor 8.65 Miles w/3-1590	MULLINS-MARION 115 kV LINE
----	90.07	----	----	----	----	----	Operating Procedure	MARION-DILLON TAP 115 kV LINE
----	----	90.49	----	----	----	----	Beyond 10-Year Planning Horizon	SUMTER-SUMTER GOLD KIST TAP 115 kV LINE
----	----	90.56	----	----	----	----	Beyond 10-Year Planning Horizon	KINGS HIGHWAY-SUMTER GOLD KIST TAP 115 kV LINE
----	----	93.44	----	----	----	----	Beyond 10-Year Planning Horizon	KINGS HIGHWAY-SHAW AFB TAP 115 kV LINE
----	94.8	109.89	----	----	----	93.96	*Coordinate w/SCEG - Reconductor 7.37 Miles w/3-795	EASTOVER-SHAW AFB TAP 115 kV LINE
----	----	98.99	----	----	----	----	Beyond 10-Year Planning Horizon	SUMTER-WATEREE 230 kV LINE
----	----	100.69	----	----	----	----	Operating Procedure	CAMDEN TAP-CAMDEN CITY 115 kV LINE
93.59	102.69	115.68	----	----	----	----	Operating Procedure	CAMDEN-CAMDEN TAP 115 kV LINE
91.39	100.00	112.34	----	----	----	----	Operating Procedure	CAMDEN-INDUSTRIAL CUSTOMER115 kV LINE
----	----	91.02	----	----	----	----	Beyond 10-Year Planning Horizon	INDUSTRIAL CUSTOMER-ELGIN TAP 115 kV LINE
								Bus Differential Relay Failure (P-5)
101.04	N/A	N/A	98.78	N/A	N/A	N/A	Beyond 10-Year Planning Horizon	WEATHERSPOON-WEST LUMBERTON 115 kV LINE
96.88	N/A	N/A	96.21	N/A	N/A	N/A	Beyond 10-Year Planning Horizon	SUTTON-WILMINGTON PCS 115 kV LINE
								Internal Breaker Fault (P-2)
96.94	N/A	N/A	96.33	N/A	N/A	N/A	Beyond 10-Year Planning Horizon	SUTTON-WILMINGTON PCS 115 kV LINE
							*Hypothetical Projects	

Collaborative Plan Projects Selected

- Compare alternatives and select preferred solutions

Study Report Prepared

- Prepare draft report and distribute to TAG for review and comment

Questions ?

Discussion of Operating Guides

Mark Byrd - DEP

Orvane Piper - DEC

Discussion of Operating Guides

- What is an Operating Guide?
- Categories of Operating Guides
- Possible Reasons for using an Operating Guide

Possible Reasons for using an Operating Guide (for a P0 – P3 Contingency)

- If project mitigation is very expensive and provides little network value
- Can provide a temporary fix until permanent mitigation can be completed for unforeseen load or generation addition
- Sometimes transmission projects can be very difficult to construct due to public opposition or environmental issues
- Other miscellaneous

Example Operating Guides

- **Rockingham - West End 230 kV West**
- **Weatherspoon Plant - Marion 115 kV**
- **Wateree - Great Falls 100 kV**

Example Operating Guides (continued)

- **Past**
  - **McGuire - Riverbend 230 kV**

- **Future**
  - **Riverview - Peach Valley 230 kV**

Questions ?

Regional Studies Reports

Bob Pierce

Duke Energy Carolinas

Questions ?

2016 TAG Work Plan Update

Rich Wodyka

Administrator

2016 NCTPC Overview Schedule

Reliability Planning Process

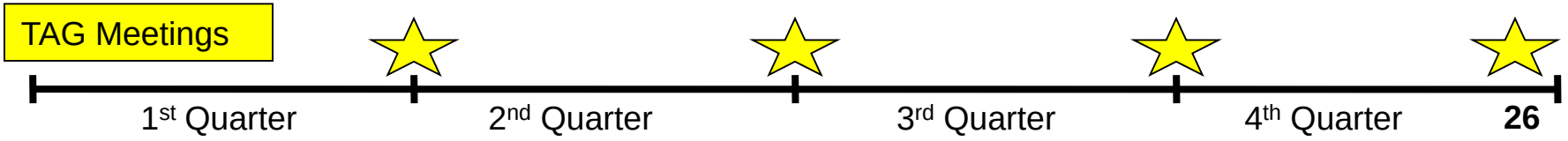
- Evaluate current reliability problems and transmission upgrade plans
  - Perform analysis, identify problems, and develop solutions
    - Review Reliability Study Results

Local Economic Planning Process

- No Local Economic Studies or Public Policy Studies were proposed by Stakeholders
- Perform Additional Sensitivities Studies

Coordinated Plan Development

- Reliability Study Results
- OSC publishes DRAFT Plan
- TAG review and comment



2016 TAG Work Plan

January – February - March

- **2016 Study – Finalize Study Scope of Work**
  - **Receive final 2016 Reliability Study Scope for comment**
    - ***Review and provide comments to the OSC on the final 2016 Study Scope – Provide Comments by March 31st***
  - ✓ **Receive request from OSC to provide input on proposed Local Economic Study scenarios and interfaces for study**
    - ***Provide input to the OSC on proposed Local Economic Study scenarios and interfaces for study – No Requests***
  - ✓ **Receive request from OSC to provide input in identifying any**
    - ***Provide input to the OSC in identifying any public policies that are driving the need for local transmission for study – No Requests***

January – February - March

First Quarter TAG Meeting – March 14th Webinar

- **2016 Study Update**
  - ✓ **Receive a progress report on the Reliability Planning study activities and 2016 Study Scope**
  - ✓ ***Provide comments on the final 2016 Study Scope to Rich Wodyka at rawodyka@aol.com by March 31st.***

April - May - June

Second Quarter TAG Meeting – Delayed until July 19th

- **2016 Study Update**
  - ✓ **Receive a progress report on the Reliability Planning study activities**
  - ✓ **Receive update status of the upgrades in the 2015 Collaborative Plan**

July – August – September

- **2016 Study Update**
  - ✓ **Receive a progress report on the Reliability Planning study activities and preliminary results**
  - ✓ **TAG will be requested to provide input to the OSC and PWG on the technical analysis performed, the problems identified as well as proposing alternative solutions to the problems identified**

July – August – September

Third Quarter TAG Meeting – September 12th

- **2016 Study Update**
  - ✓ **Receive a progress report on the Reliability Planning study activities and preliminary results**
  - ✓ ***TAG is requested to provide input on any proposed alternative solutions to Rich Wodyka at rawodyka@aol.com by October 7th.***

October - November - December

- **2016 Selection of Solutions**
  - **TAG will receive feedback from the OSC on any alternative solutions that were proposed by TAG members by the end of October.**
- **2016 Study Update**
  - **Receive and comment on final draft of the 2016 Collaborative Transmission Plan report**
  - **Discuss potential study scope for 2017 studies**

October - November - December

Fourth Quarter TAG Meeting – December 13th

- **2016 Study Update**
  - **Receive presentation on the final draft report of 2016 Collaborative Transmission Plan**
  - **Discuss potential study scope for 2017 studies**

Questions ?

TAG
Open Forum Discussion

Comments or Questions ?