



TAG Meeting September 25, 2018

Webinar



TAG Meeting Agenda

- 1. Administrative Items – Rich Wodyka**
- 2. 2018 Study Activities Update – Orvane Piper / Mark Byrd**
- 3. Regional Studies Update – Bob Pierce**
- 4. 2018 TAG Work Plan – Rich Wodyka**
- 5. TAG Open Forum – Rich Wodyka**



2018 Study Activities Update

Orvane Piper - DEC

Mark Byrd - DEP



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**

Completed



Studies for 2018

- **Annual Reliability Study**
 - **Assess DEC and DEP transmission systems' reliability and develop a single Collaborative Transmission Plan**
- **Local Economic Studies**
 - **Assess serving 300 MW hypothetical loads at 6 potential economic development sites that would have a choice of Electric Provider**



Annual Reliability Studies

- **2023 Summer: near term**
- **2023/2024 Winter: near-term**
- **2028/2029 Winter: long-term**



Preliminary Results

Red	Transmission Upgrade Required (>\$10 M)
Yellow	Transmission Upgrade Required (<\$10 M)
Orange	Operating Guide/Procedure/Solution
Green	Ancillary Equipment Upgrade



Preliminary Results - DEC

% Loading				
<u>23S</u>	<u>23W</u>	<u>SOLUTION</u>	<u>NAME</u>	<u>BRANCH TYPE</u>
100.3	---	Operating Solution (or 9.18 mile upgrade)	COKESBURY	100 kV Line
103.4	---	AEU	CONCORD	100 kV Line
95	---	4.41 mile upgrade	ECHO	100 kV Line
111.8	---	3.5 mile upgrade	FAIRNTOSH	100 kV Line
---	96.8	7.78 mile upgrade	HARLEY	100 kV Line
99	---	2.96 mile upgrade	MAULDIN	100 kV Line
101.6	---	23.74 mile upgrade	MONROE	100 kV Line
95.7	---	AEU	OAKVALE	100 kV Line
100.2	---	1.08 mile upgrade	PINEWOOD	100 kV Line
98.9	---	4.05 mile upgrade	PINHOOK	100 kV Line
98	---	1.35 mile upgrade	SEVIER	100 kV Line
116.9	---	Operating Solution (or 19.8 mile upgrade)	WATEREE	100 kV Line
97.2	---	1.45 mile upgrade	WEDDINGTON	100 kV Line
108.2	108.2	Operating Solution (or 6.5 mile upgrade)	WESTMINSTER	100 kV Line
108.3	---	4.47 mile upgrade	WYLIE	100 kV Line



Preliminary Results - DEC

<u>% Loading</u>					
<u>23S</u>	<u>23W</u>	<u>SOLUTION</u>		<u>NAME</u>	<u>BRANCH TYPE</u>
---	94.8	AEU		MERCER	230 kV Line
96.2	98.3	Operating Solution to place switchable reactor in-service (or 12.6 mile upgrade)		SADLER	230 kV Line
97.2	---	add second 230 kV circuit (33.59 miles)		SANDY RIDGE	230 kV Line
---	96.1	AEU		PISGAH TIE	230/100/44 kV Transformer
107.9	98.6	AEU		KATOMA	500 kV Line
---	95.7	Operating Solution (transformer replacement)		PARKWOOD TIE 05	500/230 kV Transformer



Preliminary Results - DEC

% Loading				
28W	SOLUTION		NAME	BRANCH TYPE
100.5	4.7 mile upgrade	Yellow	DAVIDSON RIVER	100 kV Line
101.6	7.78 mile upgrade	Red	HARLEY	100 kV Line
---	4.6 mile upgrade	Yellow	MULL	100 kV Line
116.6	Operating solution (or 6.5 mile upgrade)	Orange	WESTMINSTER	100 kV Line
113.2	AEU	Green	MERCER	230 kV Line
100	Operating Solution to place switchable reactor in-service (or 12.6 mile upgrade)	Orange	SADLER	230 kV Line
103.4	AEU	Green	PISGAH TIE	230/100/44 kV Transformer



New Projects in 2018 Plan

Reliability Project	TO	I/S Date
Ballantyne Switching Station	DEC	12/1/19
NTE II (@ Ernest Switching Station)	DEC	12/1/21
Wilkes 230/100 kV Tie	DEC	12/1/23



North Carolina Transmission Planning Collaborative

Preliminary Results - DEP

%Loading (23S)						
<u>Base</u>	<u>AshvCC1Dn</u> <u>TRM</u>	<u>Br1Dn</u> <u>TRM</u>	<u>HarDn</u> <u>TRM</u>	<u>Rob2Dn</u> <u>TRM</u>	<u>Solution</u>	<u>Monitored Facility</u>
---	---	91.87	90.95	102.70	Operating Procedure (or 3.39 mile upgrade)	CAMDEN-CAMDEN TAP 115 kV LINE
---	---	90.26	89.39	100.52	Operating Procedure (or 0.73 mile upgrade)	CAMDEN-INDUSTRIAL CUSTOMER 115 kV LINE

%Loading (23W)						
<u>Base</u>	<u>AshvCC1Dn</u> <u>TRM</u>	<u>Br1Dn</u> <u>TRM</u>	<u>HarDn</u> <u>TRM</u>	<u>Rob2Dn</u> <u>TRM</u>	<u>Solution</u>	<u>Monitored Facility</u>
---	---	109.97	90.81	86.49	2022 Project (reconductor) <\$10M	MAXTON-BUTLER TAP 115 kV LINE
---	---	97.75	---	---	2022 Project (reconductor) <\$10M	LOF-BUTLER TAP 115 kV LINE
---	---	96.13	---	---	2026 Project (reconductor) <\$10M	MAXTON-PEMBROKE 115 kV LINE
95.87	95.85	89.64	88.55	88.86	Operating Procedure (or AEU)	GOLDSBORO SS-P&GEMC ARBA POD 115 kV LINE
---	---	---	90.85	---	Operating Procedure (or 7.9 mile upgrade)	ROCKINGHAM-WADESBORO TAP 230 kV LINE
---	---	---	---	90.68	Operating Procedure (or upgrade transformers)	WATEREE 115/100 kV TRANSFORMER

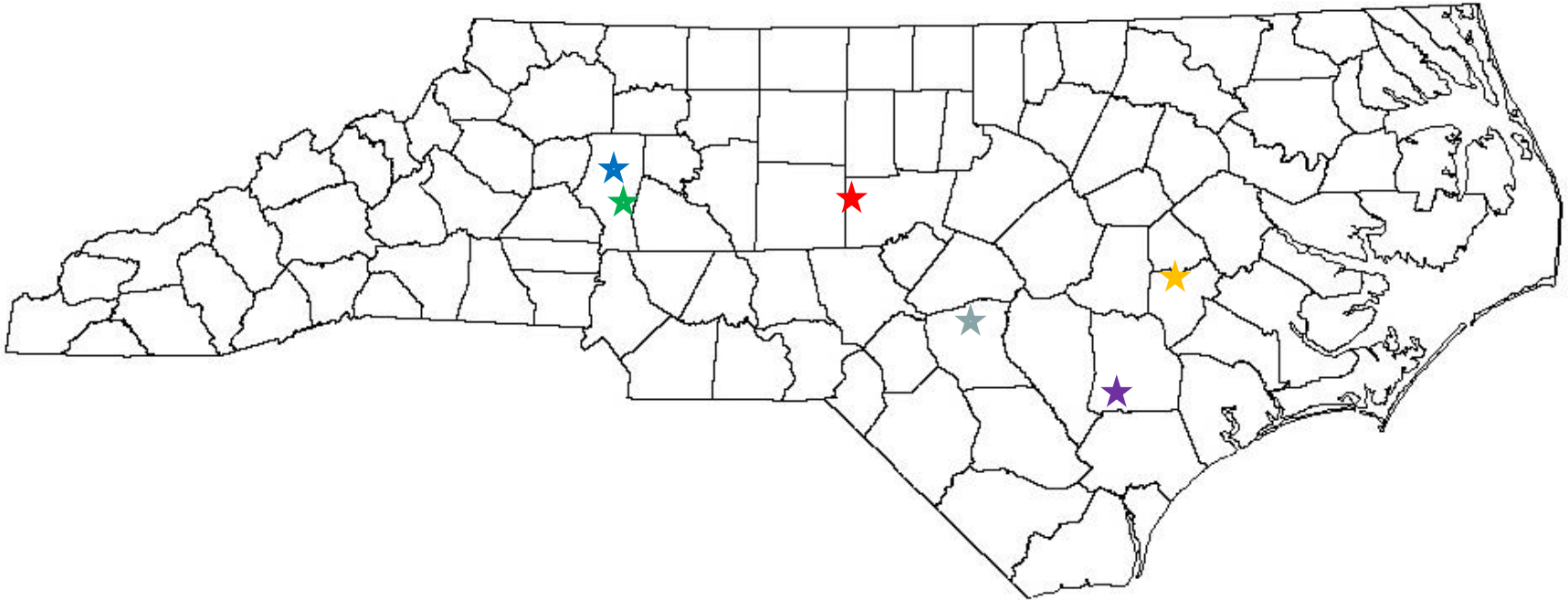


Preliminary Results - DEP

%Loading (28W)						
<u>Base</u>	<u>AshvCC1Dn</u> <u>TRM</u>	<u>Br1Dn</u> <u>TRM</u>	<u>HarDn</u> <u>TRM</u>	<u>Rob2Dn</u> <u>TRM</u>	<u>Solution</u>	<u>Monitored Facility</u>
91.04	90.96	116.52	97.17	92.86	2022 Project (reconductor) <\$10M	MAXTON-BUTLER TAP 115 KV LINE
---	---	103.56	86.36	---	2022 Project (reconductor) <\$10M	LOF-BUTLER TAP 115 kV LINE
---	---	101.56	---	---	2026 Project (reconductor) <\$10M	MAXTON-PEMBROKE 115 KV LINE



North Carolina Transmission Planning Collaborative



- ★ Chatham-Siler City Advanced Manufacturing Site
- ★ GTP Parcel 1
- ★ Highway 70 East
- ★ Peppercorn Plantation
- ★ SouthPark Phase II – Duplin County Business & Industry
- ★ US 401 North Site



Highway 70 East - DEC

- **No additional projects identified beyond what was identified in base reliability results for 2028/2029 Winter**
- **Interconnect via switching station and two 230 kV fold-in's (1.34 miles, 1.6 miles)**



Peppercorn Plantation – DEC (Marshall 230 kV)

- **No additional projects identified beyond what was identified in base reliability results for 2028/2029 Winter**
- **Interconnect via switching station and double circuit 230 kV line (8 miles)**



Peppercorn Plantation - DEC (Mitchell River 230 kV)

- **No additional projects identified beyond what was identified in base reliability results for 2028/2029 Winter**
- **Interconnect via switching station and double circuit 230 kV line (7.28 miles)**



Chatham-Siler City AMS - DEP

- **A 7.96 mile section of the Rockingham-West End 230 kV West Line would have to be reconducted**
- **A switching station and two 0.6 mile feeders would be required to interconnect this load**



SouthPark Phase II – Duplin Co - DEP

- **No additional projects identified beyond what was identified in base reliability results for 2028/2029 Winter**
- **A switching station and two 0.1 mile feeders would be required to interconnect this load**



US 401 North - DEP

- **A 7.96 mile section of the Rockingham-West End 230 kV West Line would have to be reconductored, and**
- **A 4.09 mile section of the Erwin-Fayetteville East 230 kV Line would have to be reconductored**
- **A switching station and two 2.6 mile feeders would be required to interconnect this load**



GTP Parcel 1 - DEP

- **Ancillary equipment upgrades would be required for 2 lines leaving Wommack 230 kV Sub**
- **No switching station required but two 7.8 mile feeders would be required to interconnect this load**



TAG Input Request

- TAG is requested to provide any feedback and/or propose alternative solutions to the OSC on the 2018 Preliminary Study Results.
- Provide input by **October 19th** to Rich Wodyka (rawodyka@aol.com)



Collaborative Plan Projects Selected

- **Compare all alternatives and select preferred solutions**

Study Report Prepared

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



Questions ?





Regional Studies Reports

Bob Pierce
Duke Energy Carolinas



SERTP

SERTP 3rd Quarter Meeting

➤ *Economic Study results*



Economic Planning Studies

Economic Planning Studies

- **Southern BAA to Santee Cooper Border**
 - 1000 MW (2021 Summer Peak)
- **Santee Cooper Border to Duke Energy Carolinas and Duke Energy Progress**
 - 1000 MW (2021 Summer Peak)
- **Duke Energy Carolinas and Duke Energy Progress to Santee Cooper Border**
 - 1000 MW (2021 Summer Peak)



Economic Planning Studies

Power Flow Cases Utilized

- **Study Years:**
 - 2021
- **Load Flow Cases:**
 - 2018 Series Version 2 SERTP Regional Models
 - Summer Peak
 - Additional load levels evaluated as appropriate



Economic Planning Studies

Economic Planning Studies – Preliminary
Results

Southern BAA to Santee Cooper Border
1000 MW



Transmission System Impacts

- **Transmission System Impacts Identified:**
 - Significant constraints were identified in the following SERTP Balancing Authority Areas:
 - *DEC*
 - *SBAA*
- **Potential Transmission Enhancements Identified:**
 - (DEC) Two (2) 100kV Transmission Line Upgrades
 - (DEC) One (1) Capacitor Bank Installation
 - (SBAA) One (1) 115kV Transmission Line Upgrade

SERTP TOTAL (\$2018) = \$42,480,000



Southern BAA to Santee Cooper – 1000 MW

Potential Enhancements Identified – DEC

Table 2: Potential Enhancements - DEC

Item	Potential Enhancement	Planning Level Cost Estimate
P1	Hodges Tie – Coronaca Tie 100kV double circuit T.L. <ul style="list-style-type: none">Rebuild the entire 9.2 mile Hodges Tie – Coronaca Tie 100kV double circuit transmission line with 954 ACSR conductors rated to 120°C	\$12,700,000
P2	Laurens Tie <ul style="list-style-type: none">Install a 28.8 MVAR capacitor bank at Laurens Tie	\$900,000
P3	Laurens Tie – Bush River Tie 100kV double circuit T.L. <ul style="list-style-type: none">Rebuild approximately 8.0 miles of Laurens Tie – Bush River Tie 100kV double circuit transmission line with 954 ACSR conductors rated to 120°C.	\$12,800,000
DEC TOTAL (\$2018)		\$26,400,000⁽¹⁾



Southern BAA to Santee Cooper – 1000 MW

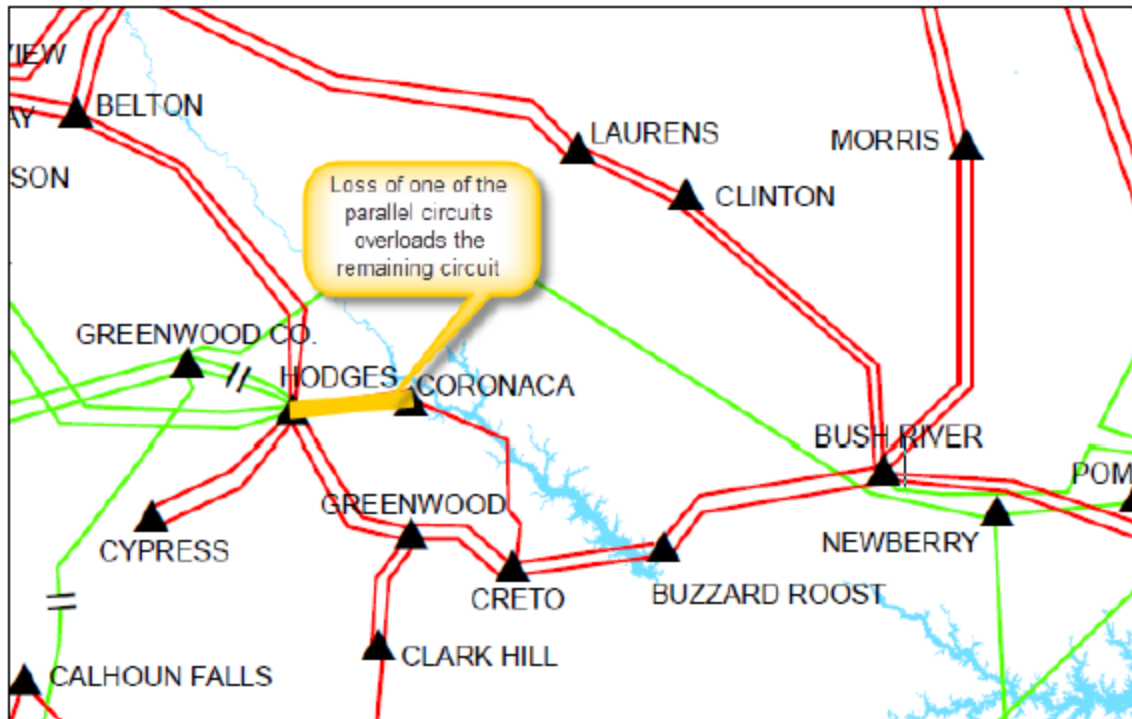
Potential Enhancement Locations – *DEC*





Southern BAA to Santee Cooper – 1000 MW

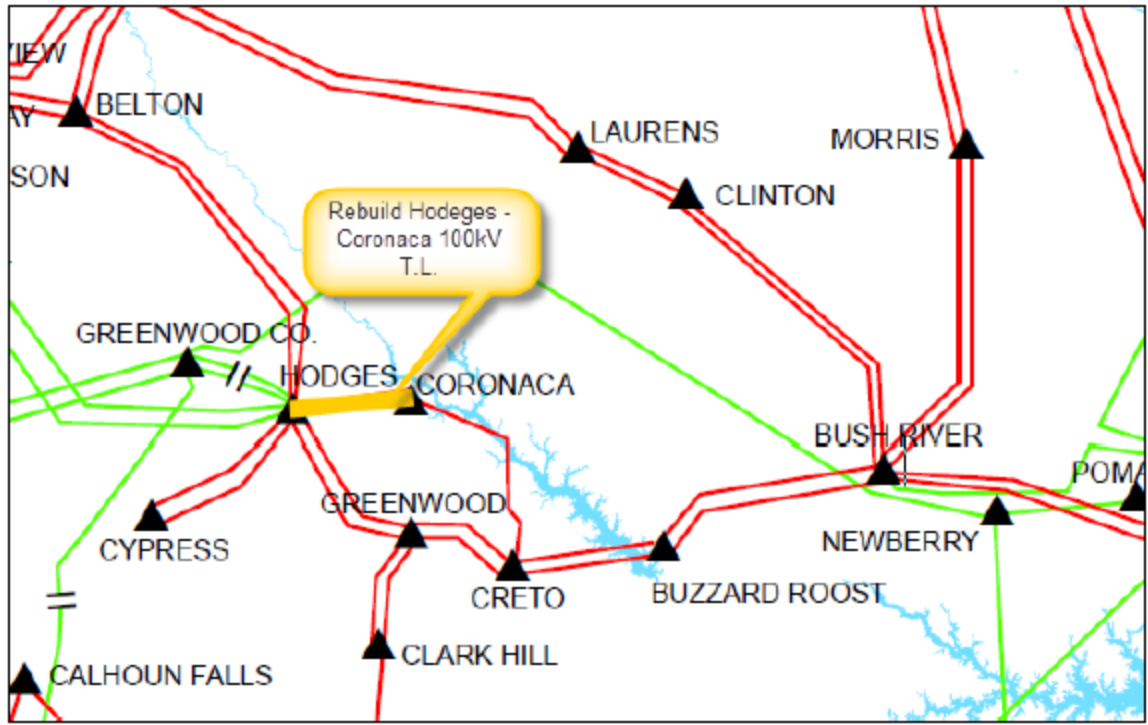
Significant Constraint (P1) – DEC





Southern BAA to Santee Cooper – 1000 MW

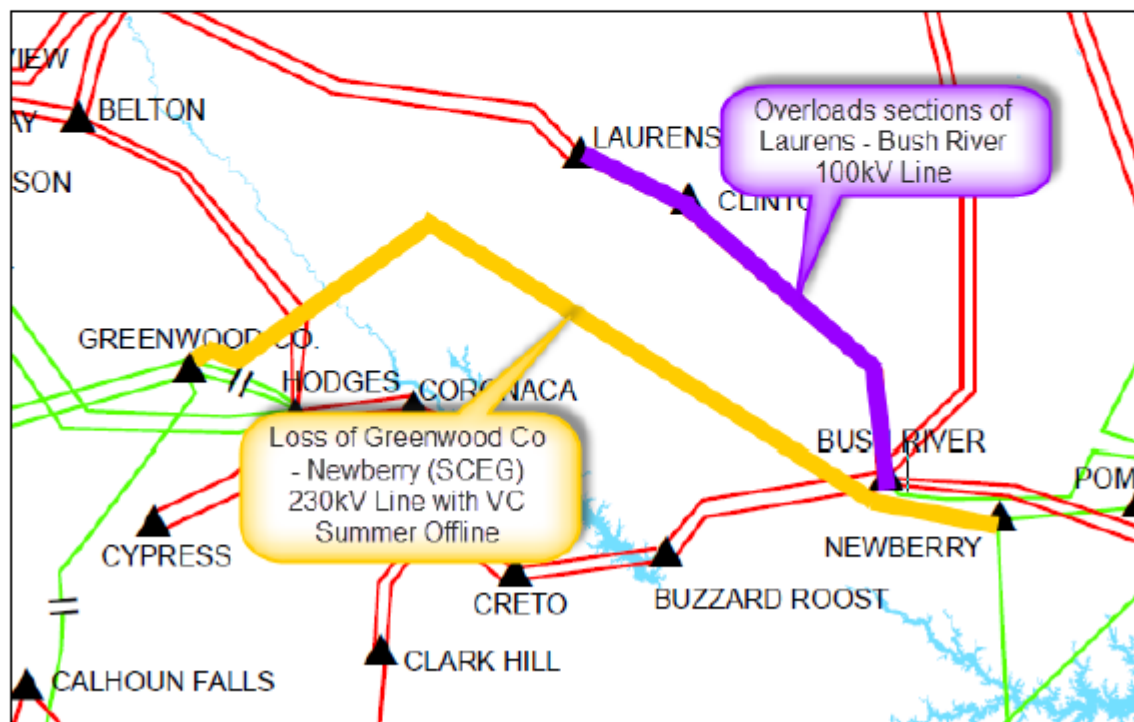
Potential Enhancement (P1) – DEC





Southern BAA to Santee Cooper – 1000 MW

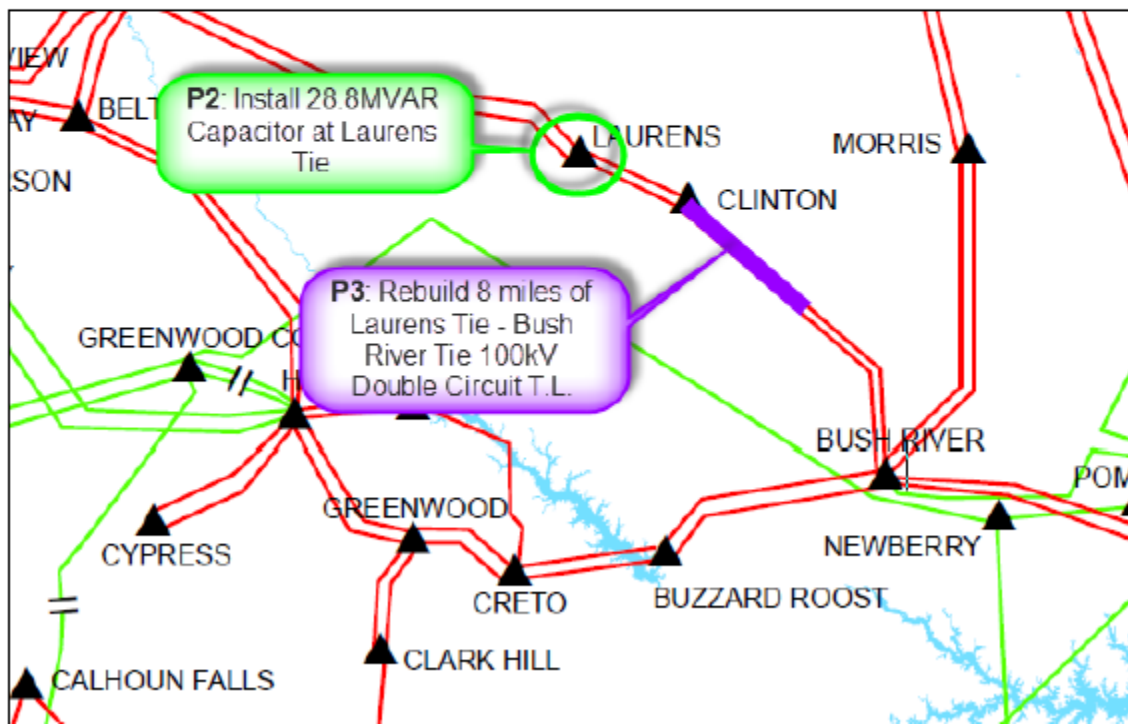
Significant Constraint (P2 & P3) – DEC





Southern BAA to Santee Cooper – 1000 MW

Potential Enhancement (P2 & P3) – DEC





Duke Energy to Santee Cooper– 1000 MW

Potential Enhancements Identified – DEC

Table 13: Potential Enhancements - DEC

Item	Potential Enhancement	Planning Level Cost Estimate
P1	Hodges Tie – Coronaca Tie 100kV double circuit T.L. <ul style="list-style-type: none"> Rebuild the entire 9.2 mile Hodges Tie – Coronaca Tie 100kV double circuit transmission line with 954 ACSR conductors rated to 120°C. 	\$12,700,000
P2	Laurens Tie <ul style="list-style-type: none"> Install a 28.8 MVAR capacitor bank at Laurens Tie. 	\$900,000
P3	Laurens Tie – Bush River Tie 100kV double circuit T.L. <ul style="list-style-type: none"> Rebuild approximately 8.0 miles of Laurens Tie – Bush River Tie 100kV double circuit transmission line with 954 ACSR conductors rated to 120°C. 	\$12,800,000
DEC TOTAL (\$2018)		\$26,400,000⁽¹⁾

(1) Total planning level cost estimate does not include the cost of projects that are included in SERTP Sponsors' expansion plans and are scheduled to be completed by June 1st of the study year. The studied transfer depends on these projects being in-service, and the cost to support the study transfer could be greater than the total shown above if any of these projects are delayed or cancelled.



Santee Cooper to Duke Energy – 1000 MW

Transmission System Impacts – *SERTP*

- **Transmission System Impacts Identified:**
 - Significant constraints were identified in the following SERTP Balancing Authority Areas:
 - *DEC*
 - *DEPE*
- **Potential Transmission Enhancements Identified:**
 - (DEC) Two (2) 100kV Transmission Line Upgrades
 - (DEPE) One (1) Substation Upgrade
 - (DEPE) One (1) New 230kV Transmission Line

SERTP Total (\$₂₀₁₈) = \$57,800,000



Santee Cooper to Duke Energy – 1000 MW

Potential Enhancements Identified – DEC

Table 8: Potential Enhancements - DEC

Item	Potential Enhancement	Planning Level Cost Estimate
P1	<p>Lee Steam – Shady Grove Tie 100kV double circuit Transmission Lines</p> <ul style="list-style-type: none"> Rebuild both double circuit transmission lines (4 circuits) between Lee Steam and Shady Grove Tie with 1158 ACSS conductors rated to 200°C. Total of 20.5 miles of line upgrades 	\$32,800,000
DEC TOTAL (\$2018)		\$32,800,000⁽¹⁾

(1) Total planning level cost estimate does not include the cost of projects that are included in SERTP Sponsors' expansion plans and are scheduled to be completed by June 1st of the study year. The studied transfer depends on these projects being in-service, and the cost to support the study transfer could be greater than the total shown above if any of these projects are delayed or cancelled.



Santee Cooper to Duke Energy – 1000 MW

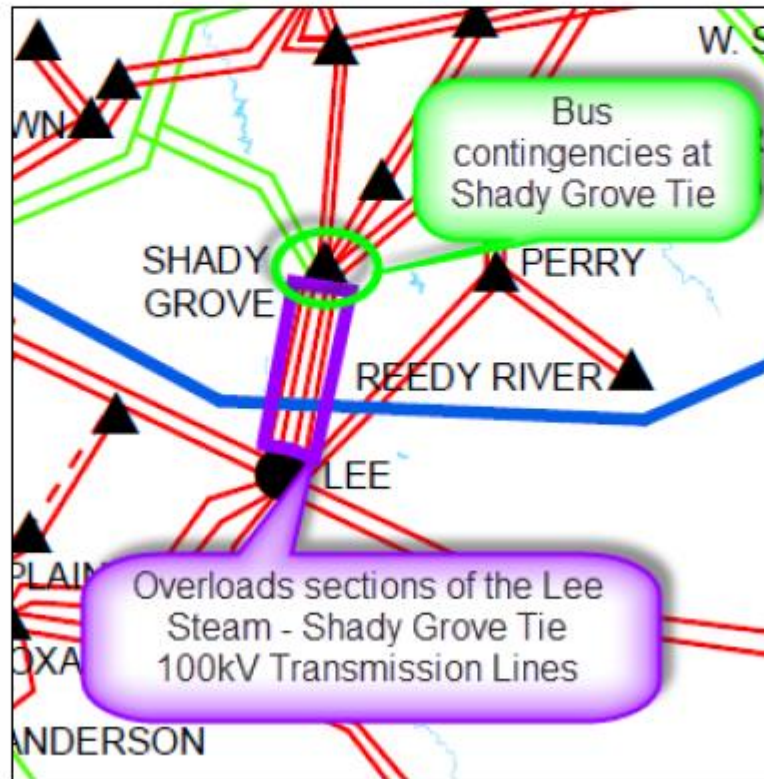
Potential Enhancement Locations – *DEC*





Santee Cooper to Duke Energy – 1000 MW

Significant Constraint (P1) – DEC





Santee Cooper to Duke Energy– 1000 MW

Potential Enhancements Identified – *DEPE*

Table 9: Potential Enhancements - DEPE

Item	Potential Enhancement	Planning Level Cost Estimate
P1	Camden-Camden Tap 115kV Transmission Line Section Camden-Camden Ind 115kV Transmission Line Section Camden Tap-Camden City 115kV Transmission Line Section <ul style="list-style-type: none">Upgrade Camden Junction 115kV Switching Station to 230kV Substation, Construct Camden Junction-(SCPSA)Camden 230kV Transmission Line	\$25,000,000
DEPE TOTAL (\$2018)		\$25,000,000⁽¹⁾



Santee Cooper to Duke Energy– 1000 MW

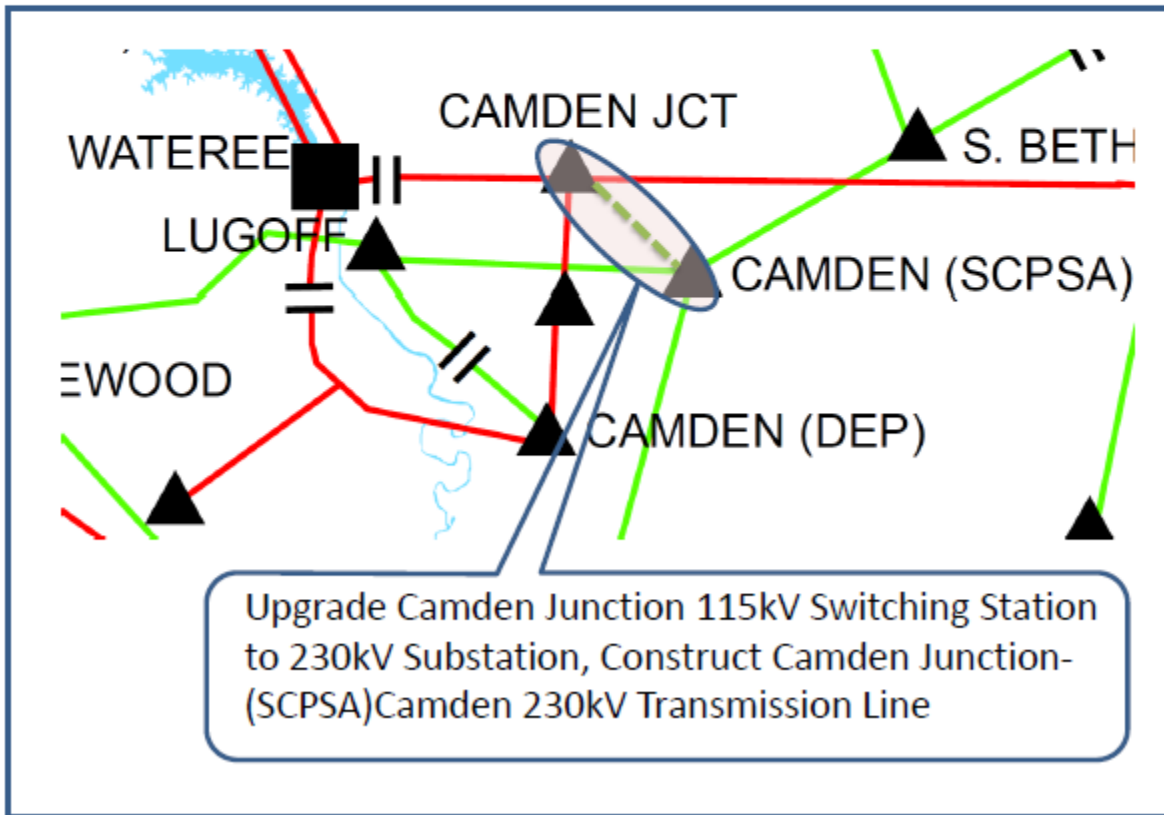
Potential Enhancement Locations – *DEPE*





Santee Cooper to Duke Energy – 1000 MW

Potential Enhancement (P1) – DEPE





<http://www.southeasternrtp.com/>



NERC Activities Report

NERC TPL-001-5 APPROVED

- ***Evaluation of known outages in the NTPH***
- ***Single points of failure***



Questions ?





2018 TAG Work Plan

Rich Wodyka
Administrator



2018 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

- Propose and select Local Economic Studies and Public Policy Study scenarios
 - Perform analysis, identify problems, and develop solutions
 - Review Local Economic Study and Public Policy Results

Coordinated Plan Development

- Combine Reliability and Local Economic Study and Public Policy Results
 - OSC publishes DRAFT Plan
 - TAG review and comment

TAG Meetings





January - February – March

- **2018 Study – Finalize Study Scope of Work**
 - ✓ Receive request from OSC to provide input on proposed Local Economic Study scenarios and interfaces for study
 - *TAG provide input to the OSC on proposed Local Economic Study scenarios and interfaces for study – **No TAG requests received***
 - ✓ Receive request from OSC to provide input in identifying any public policies that are driving the need for local transmission
 - *TAG provide input to the OSC in identifying any public policies that are driving the need for local transmission for study - **No TAG requests received***
 - ✓ Receive final 2018 Reliability Study Scope for comment
 - *TAG review and provide comments to the OSC on the final 2018 Study Scope*



January - February – March

First Quarter TAG Meeting – *March 27th*

➤ 2018 Study Update

- ✓ Receive a report on the Local Economic Study scope and any public policy scenarios that are driving the need for local transmission for study**
- ✓ Receive a progress report on the Reliability Planning study activities and the final draft of the 2018 Study Scope**



April - May – June

Second Quarter TAG Meeting – *June 19th*

- **2018 Study Update**
 - ✓ Receive a progress report on study activities

 - ✓ Receive a mid-year update on the status of the upgrades in the 2017 Collaborative Transmission Plan



July - August – September

Third Quarter TAG Meeting – **September 25th**

➤ 2018 Study Update

- ✓ Receive a progress report on the study activities and preliminary results
- ✓ TAG is requested to provide feedback to the OSC on the technical analysis performed, the problems identified as well as proposing alternative solutions to the problems identified
- ✓ Provide feedback to Rich Wodyka (rawodyka@aol.com) by **October 19th**



October - November - December

Fourth Quarter TAG Meeting – *December 12th*

➤ 2018 Selection of Solutions

- TAG will receive feedback from the OSC on any alternative solutions that were proposed by TAG members

➤ 2018 Study Update

- Receive and discuss final draft of the 2018 Collaborative Transmission Plan Report
- Discuss potential study scope for 2019 studies



Questions ?





TAG
Open Forum Discussion

Comments or Questions?



- In the competitive procurement process that is underway, Duke has published a map (and also lists of substations) showing NC and SC counties that either are transmission constrained or would be transmission constrained if generation projects in the Companies' interconnection queues are all built.



- Generally, are the generation projects that have already been built “used up” transmission capacity and are thereby hastening the need to build more transmission infrastructure?
- Are there specific projects in the plan, or the plan being developed, that are to some extent driven by the congestion caused by solar development?



- When DEC and DEP plan their transmission systems, what assumption do they make about generation projects that are in the transmission interconnection queue?
- The distribution interconnection queue?
- The requirements to add solar facilities under HB 589?
- Are these included in the planning?



Questions ?

