South Carolina Regional Transmission Planning

Stakeholder Meeting

WebEx

September 28, 2020 10:00am – 12:00pm

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Purpose and Goals for Today's Meeting

- Review and Discuss the Initial Results of the Stakeholder Selected Economic Power Transfer Sensitivities

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Economic Transmission Planning Studies

Edward Chapman/
Jake Biddix

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Study Methodology

- Linear transfer analysis using PowerGem's TARA Software. Analysis includes single contingencies of SERC while monitoring the DESC's and Santee Cooper's internal Transmission Systems.

- A Thermal and Voltage analysis using PowerGem's TARA and/or PowerWorld Simulator Software. This analysis of DESC's and Santee Cooper's internal transmission systems included single contingencies, double contingencies and selected bus outages with and without the simulated transfer in effect. However, this analysis is not a complete testing of NERC TPL standards.

Case Development

- The most current MMWG models were used for the systems external to DESC and SCPSA as a starting point for the study case.

- The study case(s) include the detailed internal models for DESC and SCPSA. The study case(s) include new transmission additions currently planned to be in-service for the given year (i.e. in-service by winter 2020 for 2020W case).

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Case Development

- DESC and SCPSA have coordinated interchange which includes all confirmed long term firm transmission reservations with roll-over rights applicable to the study year.
- The coordinated cases were used to build base cases.
- Base cases were used to build transfer cases.

Study Results

- DESC and SCPSA have reported results based on thermal loading and voltage violations in accordance with their planning criteria.

- Overloaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were also excluded.

2020 Economic Planning Scenarios

Selected by Stakeholders During the May 5, 2020 Meeting

#	Source	Sink	Amount (MW)	Year	Study Conditions	Study Request
1	SOCO	SCPSA	300	2026/27	Winter	SCPSA PM
2	SOCO	SCPSA	600	2026/27	Winter	SCPSA PM
3	SOCO	SCPSA	900	2026/27	Winter	SCPSA PM
4	SOCO	SCPSA	300	2027	Summer	SCPSA PM
5	SOCO	SCPSA	600	2027	Summer	SCPSA PM

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Power Flow Base Cases

- 2019 MMWG Series PSSE Models with DESC and SCPSA 2020 Internal Model Updates
  - 2027 Summer
  - 2026/27 Winter

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Preliminary Result Components

- The following information is preliminary and subject to change pursuant to additional analyses.
- The following information does not represent a commitment to proceed with the recommended enhancements nor implies that the recommended enhancements could be implemented by the study dates.
- These potential solutions only address constraints identified within the respective areas that comprise the SCRTP. Balancing Areas external to the SCRTP were not monitored, which could result in additional limitations and required system enhancements.

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Scenario 1

2026/27 Winter

SOCO – SCPSA 300 MW

Preliminary Results – SCPSA

SOCO – SCPSA 300 MW

2026/27 Winter Study

Constrained Facility	% Base Loading	% Study Loading	Contingency	Project
*None Identified	---	---		---

Preliminary Results – SCPSA

SOCO – SCPSA 300 MW

2026/27 Winter Study

Project	Description	Cost (2020$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2020$)	$0	

Preliminary Results – DESC

SOCO – SCPSA 300 MW

2026/27 Winter Study

Constrained Facility	% Base Loading	% Study Loading	Contingency	Project
Graniteville #2 – Sand Bar Ferry 115kV SOCO Tie	111%	121%	Loss of Toolebeck – South Augusta 230kV SOCO Tie and SRS – Vogtle 230kV SOCO Tie	SG1

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – DESC

SOCO – SCPSA 300 MW

2026/27 Winter Study

Project	Description	Cost (2020$)	Duration (Months)
SG1	Rebuild Graniteville – Stevens Creek 115kV and SOCO 115kV line(s) as a double circuit to establish Graniteville – Evans 230kV SOCO Tie (≈15 DESC miles, ≈7 SOCO miles).	$26,000,000	24-36
	TOTAL (2020$)	$26,000,000	24-36

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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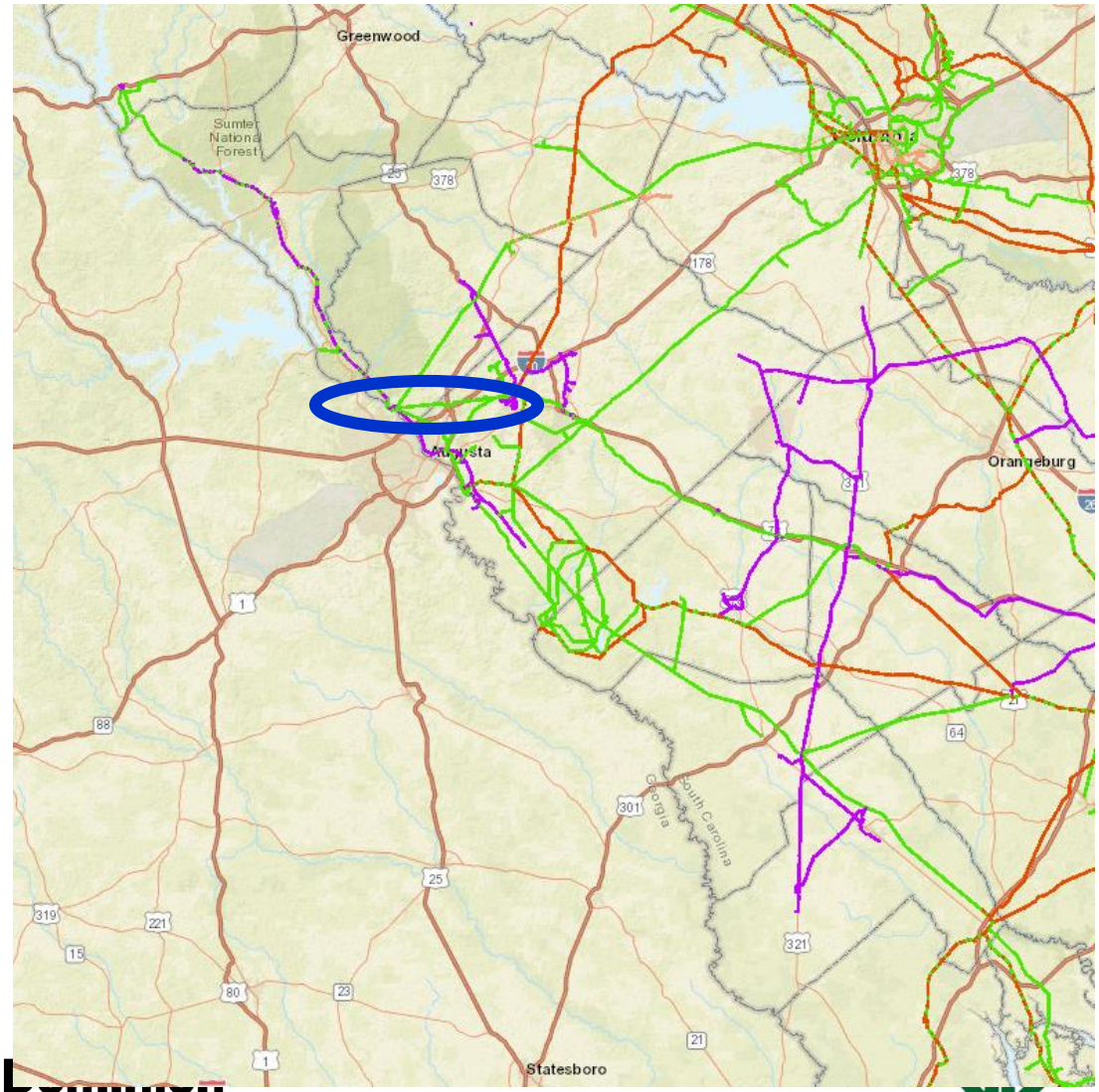
SG1 - Rebuild Graniteville – Stevens Creek 115kV and SOCO 115kV line(s)



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Scenario 2

2026/27 Winter

SOCO – SCPSA 600 MW

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Preliminary Results – SCPSA

SOCO – SCPSA 600 MW

2026/27 Winter Study

Constrained Facility	% Base Loading	% Study Loading	Contingency	Project
*None Identified	---	---		---

Preliminary Results – SCPSA

SOCO – SCPSA 600 MW

2026/27 Winter Study

Project	Description	Cost (2020$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2020$)	$0	

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Preliminary Results – DESC

SOCO – SCPSA 600 MW

2026/27 Winter Study

Constrained Facility	% Base Loading	% Study Loading	Contingency	Project
Graniteville #2 – Sand Bar Ferry 115kV SOCO Tie	111%	129%	Loss of Toolebeck – South Augusta 230kV SOCO Tie and SRS – Vogtle 230kV SOCO Tie	SG1
Toolebeck – South Augusta 230kV SOCO Tie	91%	101%	Loss of Vogtle (SOCO) – West McIntosh (SOCO) 500kV and SRS – Vogtle 230kV SOCO Tie	SG1

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – DESC

SOCO – SCPSA 600 MW

2026/27 Winter Study

Project	Description	Cost (2020$)	Duration (Months)
SG1	Rebuild Graniteville – Stevens Creek 115kV and SOCO 115kV line(s) as a double circuit to establish Graniteville – Evans 230kV SOCO Tie (≈15 DESC miles, ≈7 SOCO miles).	$26,000,000	24-36
	TOTAL (2020$)	$26,000,000	24-36

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Scenario 3

2026/27 Winter

SOCO – SCPSA 900 MW

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Preliminary Results – SCPSA

SOCO – SCPSA 900 MW

2026/27 Winter Study

Constrained Facility	%Base Loading	%Study Loading	Contingency	Project
Yemassee (SCPSA) – Yemassee (DESC) 230 kV	N/A	103 %	Bluffton-Purrysburg 230 kV & Aiken #3-Toolebeck 230 kV	1

Preliminary Results – SCPSA

SOCO – SCPSA 900 MW

2026/27 Winter Study

Project	Description		Cost (2020$)	Duration (Months)
1	Replace Switches at Yemassee 230 kV Switching Station		$86,000	12
		TOTAL (2020$)	$86,000	

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Preliminary Results – DESC

SOCO – SCPSA 900 MW

2026/27 Winter Study

Constrained Facility	% Base Loading	% Study Loading	Contingency	Project
Graniteville #2 – Sand Bar Ferry 115kV SOCO Tie	111%	137%	Loss of Toolebeck – South Augusta 230kV SOCO Tie and SRS – Vogtle 230kV SOCO Tie	SG1
Toolebeck – South Augusta 230kV SOCO Tie	91%	104%	Loss of Vogtle (SOCO) – West McIntosh (SOCO) 500kV and SRS – Vogtle 230kV SOCO Tie	SG1
Barnwell – SRS 115kV	100%	103%	Loss of Canadys – SRS 230kV and Urquhart – Graniteville 230kV	SG2

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – DESC

SOCO – SCPSA 900 MW

2026/27 Winter Study

Project	Description	Cost (2020$)	Duration (Months)
SG1	Rebuild Graniteville – Stevens Creek 115kV and SOCO 115kV line(s) as a double circuit to establish Graniteville – Evans 230kV SOCO Tie (≈15 DESC miles, ≈7 SOCO miles).	$26,000,000	24-36
SG2	Rebuild Canadys – SRS 230kV as a double circuit to double the rating of the existing Canadys – SRS 230kV and add an additional Canadys – SRS 230kV line. (≈58 miles).	$89,000,000	66-72
	TOTAL (2020$)	$115,000,000	66-72

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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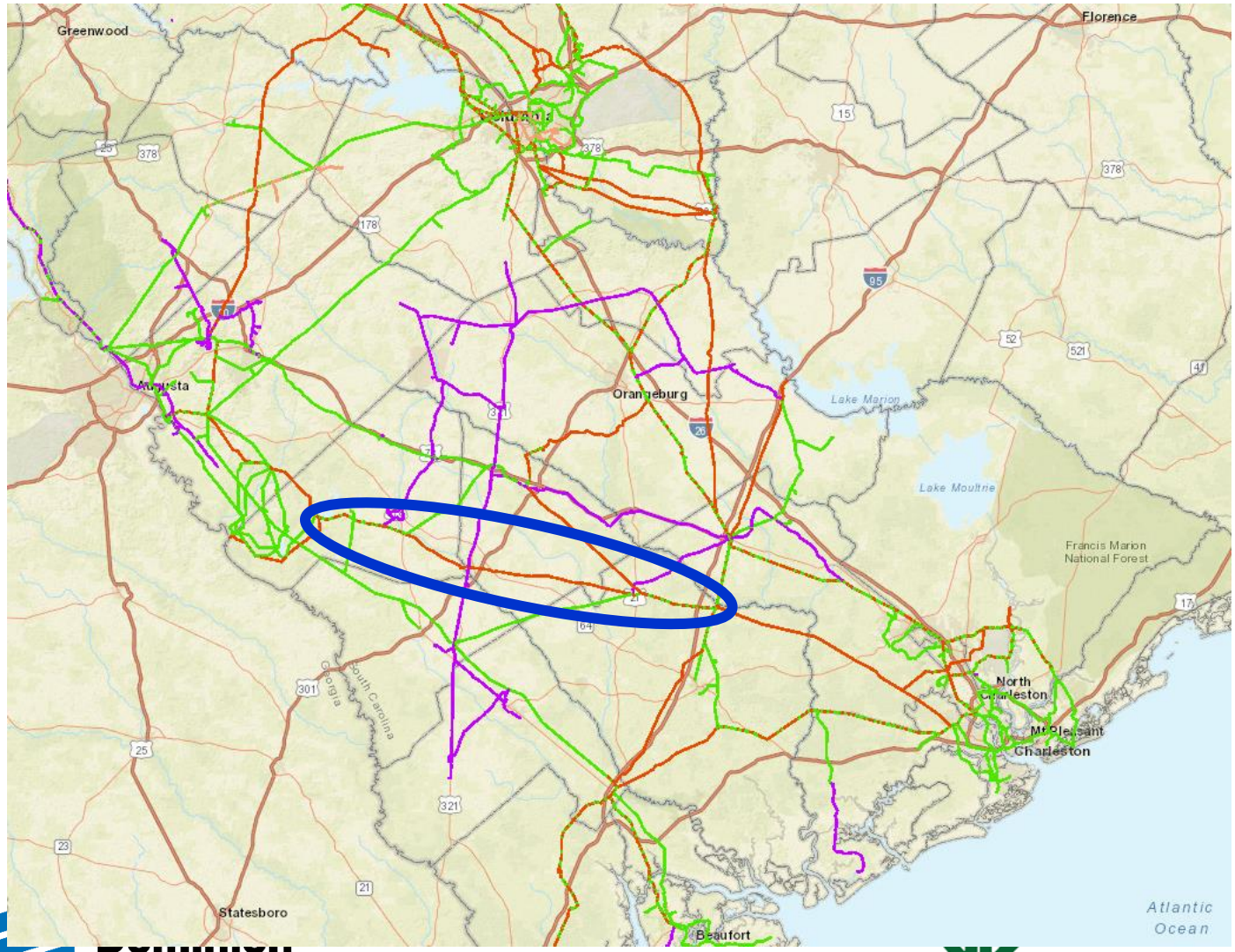
SG2 - Rebuild Canadys – SRS 230kV



Scenario 4

2027 Summer

SOCO – SCPSA 300 MW

Preliminary Results – SCPSA

SOCO – SCPSA 300 MW

2027 Summer Study

Constrained Facility	% Base Loading	% Study Loading	Contingency	Project
Yemassee (SCPSA) – Yemassee (DESC) 230 kV	N/A	101 %	Bluffton-Purrysburg 230 kV & a Cross Unit	1

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Preliminary Results – SCPSA

SOCO – SCPSA 300 MW

2027 Summer Study

Project	Description	Cost (2020$)	Duration (Months)
1	Replace Switches at Yemassee 230 kV Switching Station	$86,000	12
	TOTAL (2020$)	$86,000	

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Preliminary Results – DESC

SOCO – SCPSA 300 MW

2027 Summer Study

Constrained Facility	% Base Loading	% Study Loading	Contingency	Project
Graniteville #2 – Sand Bar Ferry 115kV SOCO Tie	127%	135%	Loss of Toolebeck – South Augusta 230kV SOCO Tie and SRS – Vogtle 230kV SOCO Tie	SG1
Toolebeck – South Augusta 230kV SOCO Tie	96%	106%	Loss of Vogtle (SOCO) – West McIntosh (SOCO) 500kV and SRS – Vogtle 230kV SOCO Tie	SG1
Ritter – Yemassee 230kV	126%	136%	Loss of Bluffton (SC) – Purrysburg (SC) 230kV and Canadys – Yemassee 230kV	SG3
Canadys – Yemassee 230kV	107%	115%	Loss of Bluffton (SC) – Purrysburg (SC) 230kV and Ritter – Yemassee 230kV	SG1 and SG2

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – DESC

SOCO – SCPSA 300 MW

2027 Summer Study

Project	Description	Cost (2020$)	Duration (Months)
SG1	Rebuild Graniteville – Stevens Creek 115kV and SOCO 115kV line(s) as a double circuit to establish Graniteville – Evans 230kV SOCO Tie (≈15 DESC miles, ≈7 SOCO miles).	$26,000,000	24-36
SG2	Rebuild Canadys – SRS 230kV as a double circuit to double the rating of the existing Canadys – SRS 230kV and add an additional Canadys – SRS 230kV line. (≈58 miles).	$89,000,000	66-72
SG3	Rebuild 115kV lines from Yemassee through Ritter as a double circuit and convert existing 230kV as 115kV. This will quadruple the ratings of the 230kV equipment and at least double the ratings of the 115kV equipment in the path. (≈17 miles). Also rebuild Church Creek – Faber Place 115kV as 1272ACSR to increase rating for additional load that occurs on the line due to other upgrades. (≈4 miles).	$36,000,000	66-72
	TOTAL (2020$)	$151,000,000	66-72

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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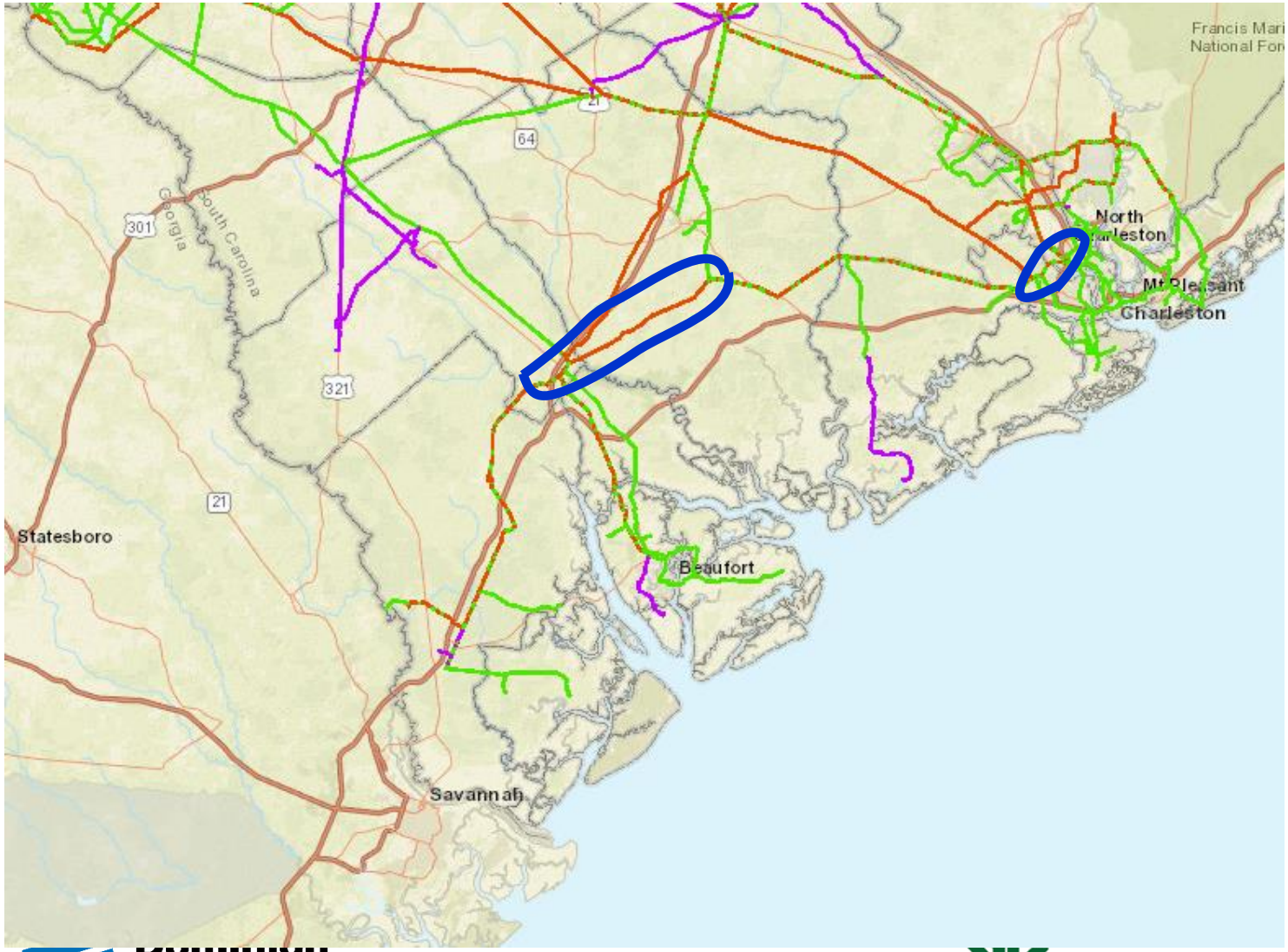
SG3 - Rebuild 115kV lines from Ritter to Yemassee and 115kV line from Church Creek to Faber Place



Scenario 5

2027 Summer

SOCO – SCPSA 600 MW

Preliminary Results – SCPSA

SOCO – SCPSA 600 MW

2027 Summer Study

Constrained Facility	%Base Loading	%Study Loading	Contingency	Project
Yemassee (SCPSA) – Yemassee (DESC) 230 kV	N/A	104 %	Bluffton-Purrysburg 230 kV & a Cross Unit	1

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Preliminary Results – SCPSA

SOCO – SCPSA 600 MW

2027 Summer Study

Project	Description	Cost (2020$)	Duration (Months)
1	Replace Switches at Yemassee 230 kV Switching Station	$86,000	12
	TOTAL (2020$)	$86,000	

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Preliminary Results – DESC

SOCO – SCPSA 600 MW

2027 Summer Study

Constrained Facility	% Base Loading	% Study Loading	Contingency	Project
Graniteville #2 – Sand Bar Ferry 115kV SOCO Tie	127%	144%	Loss of Toolebeck – South Augusta 230kV SOCO Tie and SRS – Vogtle 230kV SOCO Tie	SG1
Toolebeck – South Augusta 230kV SOCO Tie	96%	106%	Loss of Vogtle (SOCO) – West McIntosh (SOCO) 500kV and SRS – Vogtle 230kV SOCO Tie	SG1
Ritter – Yemassee 230kV	126%	145%	Loss of Bluffton (SC) – Purrysburg (SC) 230kV and Canadys – Yemassee 230kV	SG4
Canadys – Yemassee 230kV	107%	123%	Loss of Bluffton (SC) – Purrysburg (SC) 230kV and Ritter – Yemassee 230kV	SG1 and SG2
Jasper – Yemassee 230kV #1 / #2	98%	103%	Loss of Jasper – Yemassee 230kV #2 / #1 and Bluffton (SC) – Purrysburg (SC) 230kV	SG1 and SG2
Canadys – Church Creek 230kV	90%	99%	Loss of Canadys – Faber Place 230kV and Church Creek – Ritter 230kV	SG4

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – DESC

SOCO – SCPSA 600 MW

2027 Summer Study

Project	Description	Cost (2020$)	Duration (Months)
SG1	Rebuild Graniteville – Stevens Creek 115kV and SOCO 115kV line(s) as a double circuit to establish Graniteville – Evans 230kV SOCO Tie (≈15 DESC miles, ≈7 SOCO miles).	$26,000,000	24-36
SG2	Rebuild Canadys – SRS 230kV as a double circuit to double the rating of the existing Canadys – SRS 230kV and add an additional Canadys – SRS 230kV line. (≈58 miles).	$89,000,000	66-72
SG4	Rebuild 115kV lines from Yemassee through Ritter and Church Creek to Faber Place as a double circuit, and convert existing 230kV as 115kV. This will quadruple the ratings of the 230kV equipment and at least double the ratings of the 115kV equipment in the path. (≈56 miles).	$92,000,000	66-72
	TOTAL (2020$)	$207,000,000	66-72

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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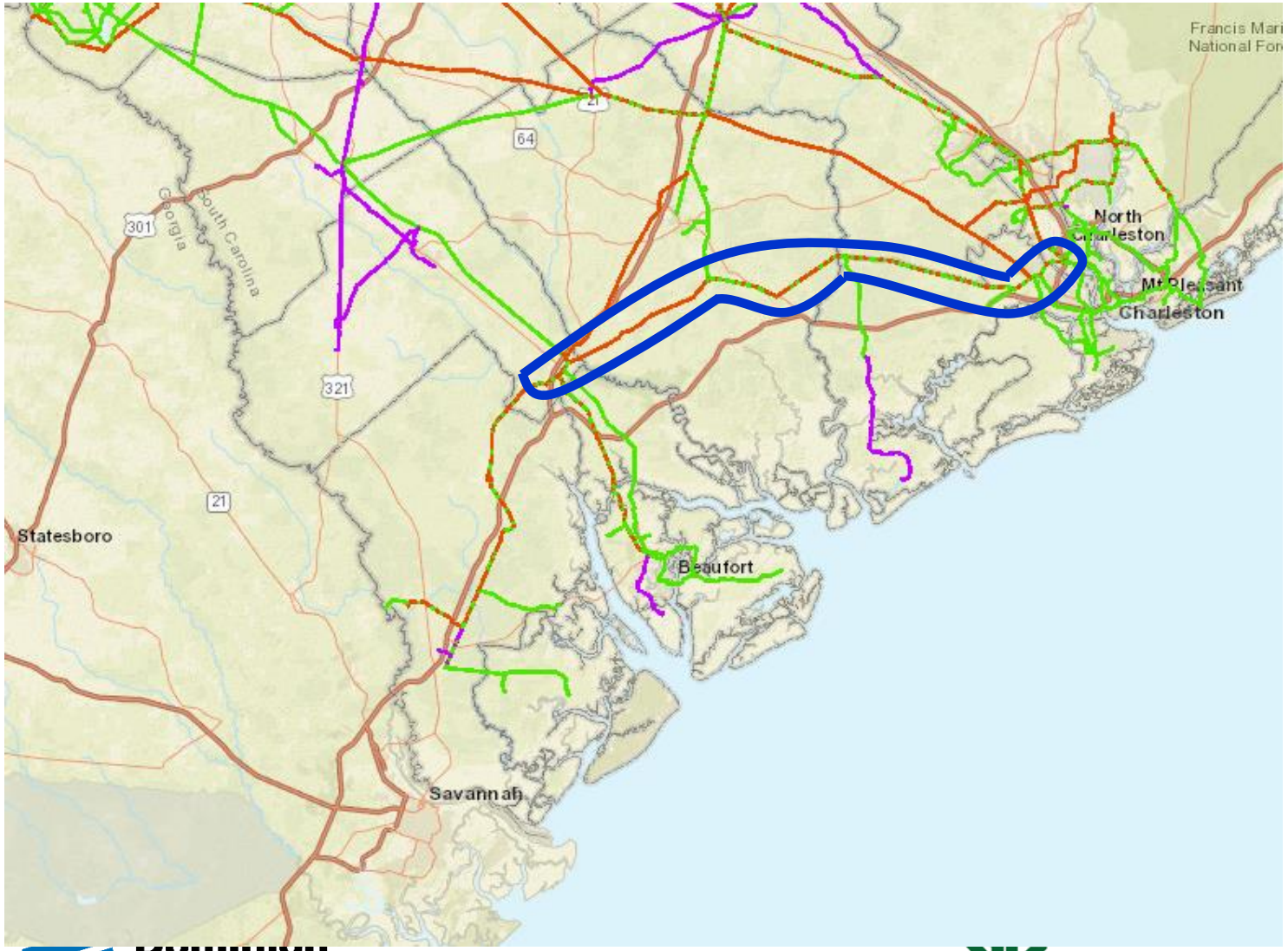
SG4 - Rebuild 115kV lines from Yemassee through Ritter and Church Creek to Faber Place



2020 Economic Planning Scenarios

Linear Transfer Results - SCPSA

#	Source	Sink	MW	Year	FCITC LIMIT	LIMIT/CONTINGENCY
1	SOCO	SCPSA	300	2026/27W	No Limit found	N/A
2	SOCO	SCPSA	600	2026/27W	No Limit found	N/A
3	SOCO	SCPSA	900	2026/27W	No Limit found	N/A
4	SOCO	SCPSA	300	2027S	No Limit found	N/A
5	SOCO	SCPSA	600	2027S	No Limit Found	N/A

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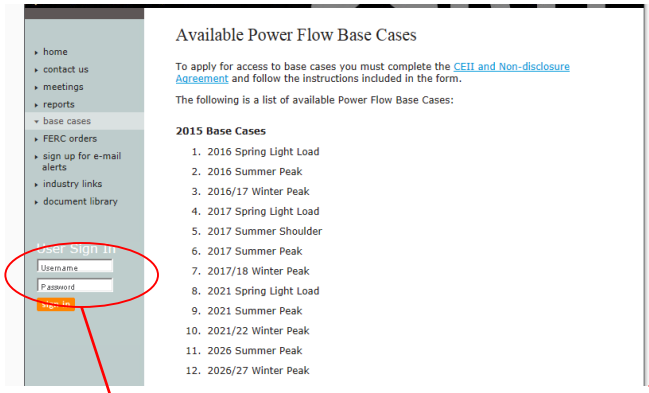
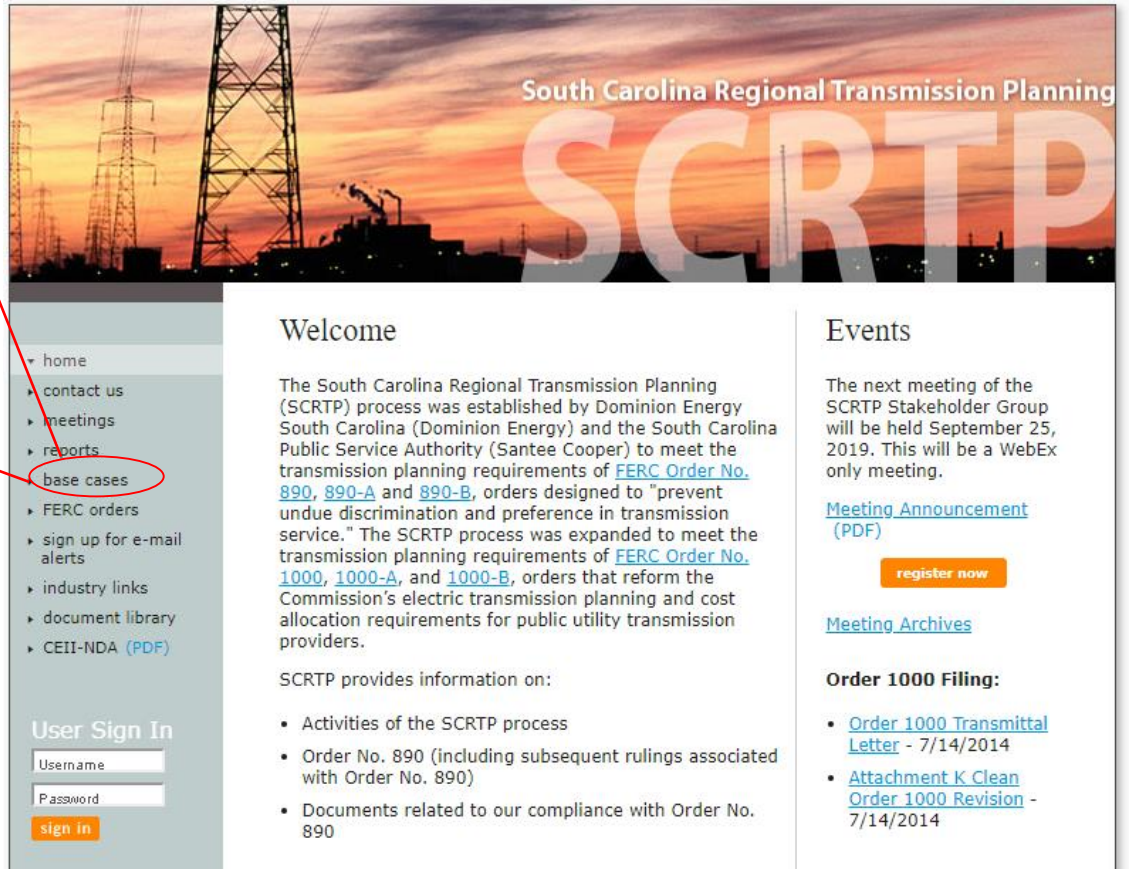
Report and Power Flow Case Access

- Draft reports will be provided to stakeholders
- Power Flow Starting Point Cases also available

https://www.SCRTP.com/home





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Economic Transmission Planning Studies Initial Findings

Stakeholder Input, Comments and Questions

Next SCRTP Meeting

- Key assumptions and data used for modeling
- Reliability Planning process
- Review all major projects included in current Local Transmission Plans
- Review and discuss Multi-Party Assessment Studies
- SCRTP Email Distribution List will be notified
- Register online

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Stakeholder Meeting

WebEx

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