Southeastern Regional TRANSMISSION PLANNING

2022 Economic Planning Studies

SERTP Southeastern Regional Transmission Planning

Economic Planning Studies Preliminary Results

Associated Electric Cooperative Inc.

Dalton UTILITIES

DUKE ENERGY.

Georgia Transmission

LG&E KU

MEAG POWER

Gulf Power

POWERSOUTH ENERGY COOPERATIVE

Southern Company

TVA

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Overview of Economic Planning Studies

Executive Summary

The Regional Planning Stakeholder Group ("RPSG") identified five (5) economic planning studies to be evaluated under the Southeastern Regional Transmission Planning ("SERTP") process. The SERTP Sponsors have performed analyses to assess potential constraints on the transmission systems of the participating transmission owners for the stakeholder requested economic planning studies selected by the Regional Planning Stakeholder Group ("RPSG"). The assessments include the identification of potentially limiting facilities, the impact of the transfers on these facilities, and the contingency conditions causing the limitations. The assessments also identify potential transmission enhancements within the footprint of the participating transmission owners necessary to accommodate the economic planning study requests, planning-level cost estimates, and the projected need-date for projects to accommodate the economic planning study requests. The information contained in this report does not represent a commitment to proceed with the recommended enhancements nor implies that the recommended enhancements could be implemented by the study dates. The assessment cases model the currently projected improvements to the transmission system. However, changes to system conditions and/or the transmission system expansion plans could also impact the results of this study. Planning staff of the participating transmission owners performed the assessments and the results are summarized in this report.

Study Assumptions

The specific assumptions selected for these evaluations were:

- Each request was evaluated for the year identified below, as selected by the RPSG
- The following economic planning studies were assessed:

1) **SOCO to DEC – 1000 MW**
   - Year: 2032
   - Load Level: Summer Peak
   - Type of Transfer: Generation to Generation
   - Source: Generation within SOCO
   - Sink: Generation within DEC

2) **DESC (Formally SCEG) to DEC – 1000 MW**
   - Year: 2032
   - Load Level: Summer Peak
   - Type of Transfer: Generation to Generation
   - Source: Generation within SCE&G
   - Sink: Generation within DEC

3) **SOCO to SC – 600 MW**
   - Year: 2027
   - Load Level: Winter Peak
   - Type of Transfer: Generation to Generation
   - Source: Generation within SOCO
   - Sink: Generation within SC

4) **SOCO to SC– 500 MW**
   - Year: 2024
   - Load Level: Summer Peak
   - Type of Transfer: Generation to Generation
   - Source: Generation within SOCO
   - Sink: Generation within SC

5) **DEC to SC– 600 MW**
   - Year: 2027
   - Load Level: Winter Peak
   - Type of Transfer: Generation to Generation
   - Source: Generation within DEC
   - Sink: Generation within SC

Case Development

- For all evaluations, the ***2022 Series Version 1 SERTP Regional Models*** were used as a starting point load flow cases for the analysis of the Economic Planning Scenarios.

Study Criteria

The study criteria with which results were evaluated included the following reliability elements:

- NERC Reliability Standards
- Individual company criteria (voltage, thermal, stability, and short circuit as applicable)

Methodology

Initially, power flow analyses were performed based on the assumption that thermal limits were the controlling limit for the reliability plan. Voltage, stability, and short circuit studies were performed if circumstances warranted.

Technical Analysis and Study Results

The technical analysis was performed in accordance with the study methodology. Results from the technical analysis were reported throughout the study area to identify transmission elements approaching their limits such that all participating transmission owners and stakeholders would be aware of any potential issues and, as such, suggest appropriate solutions to address the potential issues if necessary. The SERTP reported, at a minimum, results for monitored transmission elements within the participating transmission owners' footprint based on:

- Thermal loadings greater than 90% for facilities that are negatively impacted by the proposed transfers and change by +5% of applicable rating with the addition of the transfer(s)
- Voltages appropriate to each participating transmission owner's planning criteria (with potential solutions if criteria were violated)

Assessment and Problem Identification

The participating transmission owners ran assessments to identify any constraints within the participating transmission owners' footprint as a result of the economic planning study requests. Each participating transmission owner applied their respective reliability criteria for its facilities and any constraints identified were documented and reviewed by each participating transmission owner.

Solution Development

- The participating transmission owners, with input from the stakeholders, will develop potential solution alternatives due to the economic planning studies requested by the RPSG.

- The participating transmission owners will test the effectiveness of the potential solution alternatives using the same cases, methodologies, assumptions and criteria described above.
- The participating transmission owners will develop rough, planning-level cost estimates and in-service dates for the selected solution alternatives.

Report on the Study Results

The participating transmission owners compiled all the study results and prepared a report for review by the stakeholders. The report contains the following:

- A description of the study approach and key assumptions for the Economic Planning Scenarios
- For each economic planning study request, the results of that study including:
    1. Limit(s) to the transfer
    2. Selected solution alternatives to address the limit(s)
    3. Rough, planning-level cost estimates and in-service dates for the selected transmission solution alternatives

1. Study Request 1 Results

Southern Company to Duke Energy Carolinas - Summer 2032

1000 MW

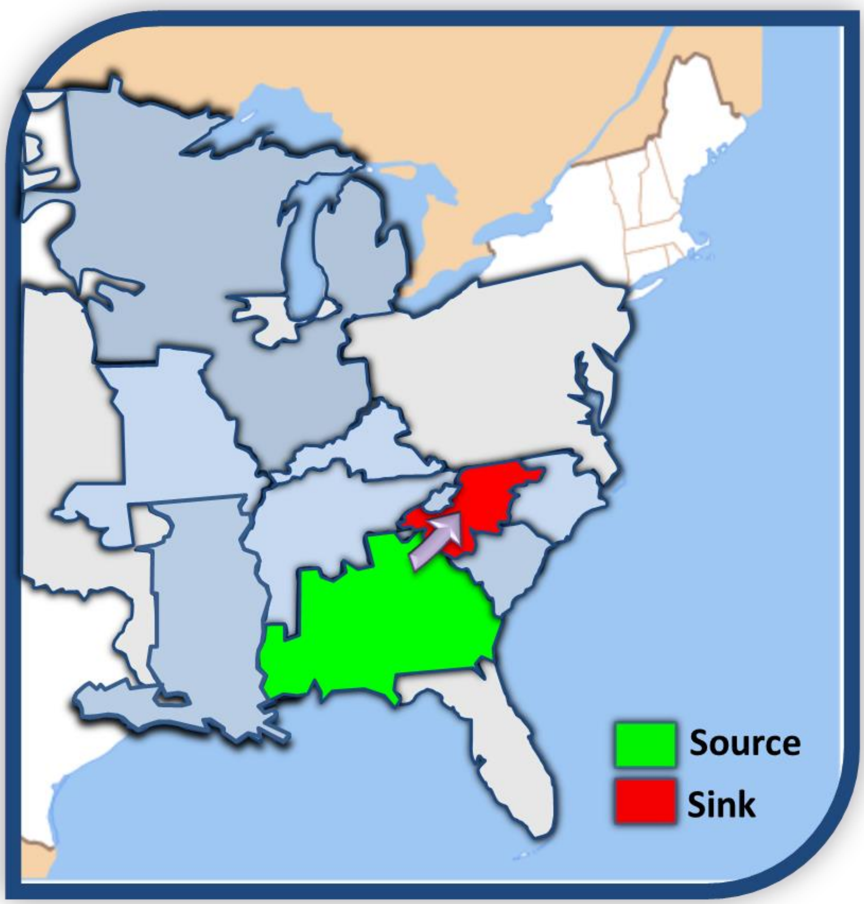

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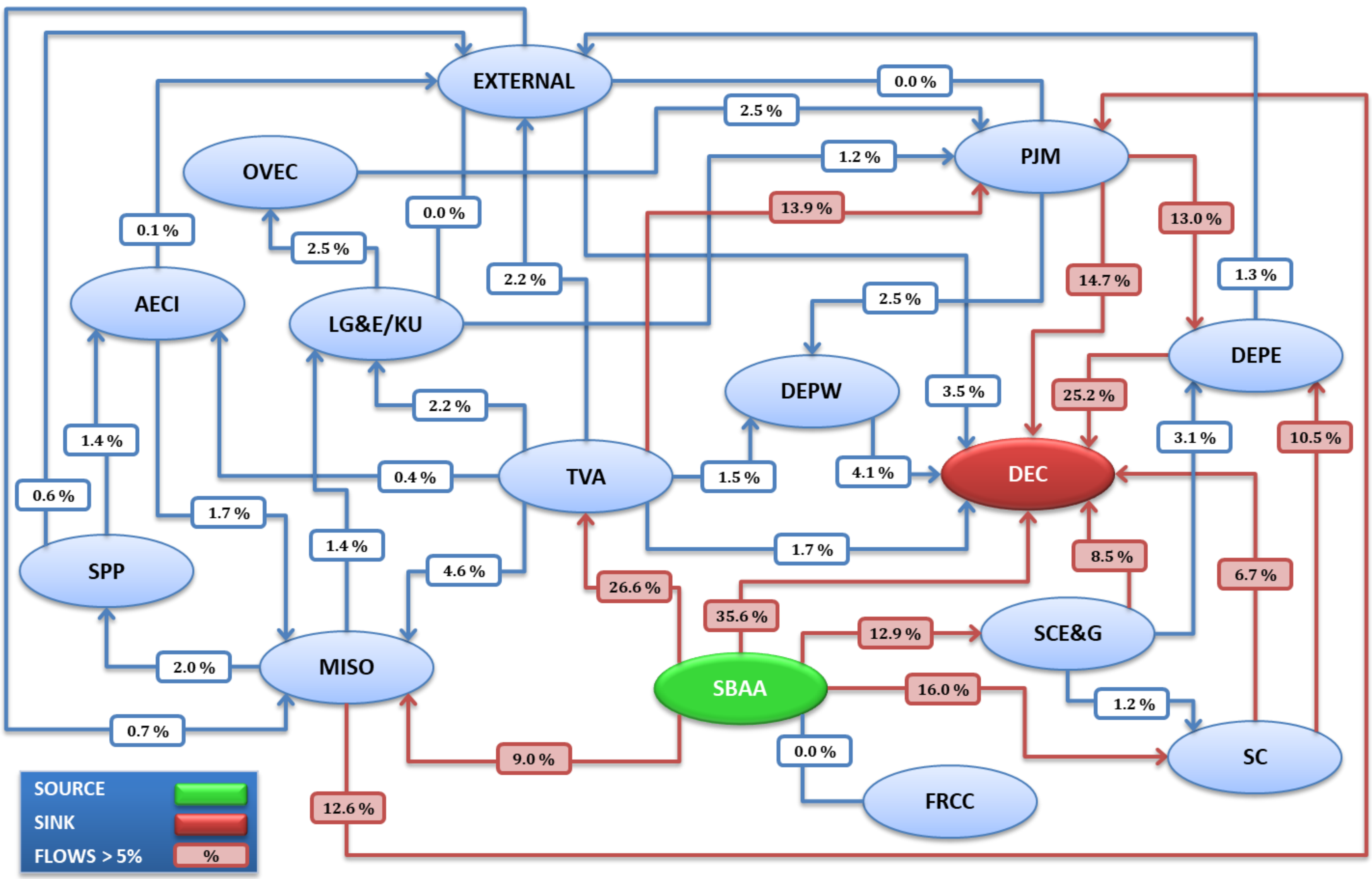
Table I.1.1. Total Cost Identified by the SERTP Sponsors

Balancing Authority Area	Planning Level Cost Estimate
Associated Electric Cooperative (AECI)	$0
Duke Carolinas (DEC)	$169,000,000
Duke Progress East (DEPE)	$0
Duke Progress West (DEPW)	$0
Gulf Power (GP)	$0
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$5,130,000
Tennessee Valley Authority (TVA)	$0
TOTAL ($2022)	**$174,130,000**

Diagram I.1.1. Transfer Flow Diagram (% of Total Transfer)



Associated Electric Cooperative Balancing Authority Area (AECI) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.2.1. Pass 0 – Transmission System Impacts with No Enhancements – *AECI*

The following table identifies significant ***AECI*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
AECI	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.2.2. Pass 1 – Potential Future Transmission System Impacts – *AECI*

The following table depicts thermal loadings of ***AECI*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
AECI	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.2.3. Potential Solutions for Identified Problems – *AECI*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
AECI TOTAL ($2022)			**$0** (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.

Duke Carolinas Balancing Authority Area (DEC) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.3.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEC*

The following table identifies significant ***DEC*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEC	Lee Steam – Shady Grove Tie 100 kV TL (Lee Line)	132	88.1	94.5	Loboe on Lee Steam – Greenbriar Switching Station 100 kV T.L.	1	1
DEC	Lee Steam – Shady Grove Tie 100 kV TL (Piedmont Line Line)	132	94.5	101	Loboe on Lee Steam – Greenbriar Switching Station 100 kV T.L.	1	1
DEC	Wateree Switching – Great Falls Switching	116	89	116.1	Loss of Newport – VC Sumner 230 kV TL	2	2
DEC	Catawba Nuclear – Allen Steam 230 kV TL	1055	92.6	104.1	Loss of Parallel Catawba Nuclear – Allen Steam 230 kV TL	3	NA*

Scenario Explanations:

1. Asheboro unit 7 offline (DEPW)
2. Catawba Nuclear Unit 1 Offline
3. McGuire Nuclear Unit 1 Offline

* Project not in current version of models, but is in expansion plan

Table I.3.2. Pass 1 – Potential Future Transmission System Impacts – *DEC*

The following table depicts thermal loadings of ***DEC*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
DEC	Lee Combustion – Belton Tie 100 kV TL	132	77.7	92.1	Loss of parallel Lee Combustion – Belton Tie 100 kV TL	1	A1*
DEC	Clark Hill 115/100 kV Transformer	125	91.4	96.6	Loss of Santee Cooper 115 kV TL	1	A2*
DEC	Central Tie – Shady Grove Tie 230 kV TL	464	87.8	94.1	Loss of parallel Central Tie – Shady Grove Tie 230 kV TL	1	A3*
DEC	Lee Combustion – Toxaway Tie 100 kV TL	105	88.3	98.1	Loss of Parallel Lee Combustion – Toxaway Tie 100 kV TL	1	A4*
DEC	Riverbend Switching – Dixon School Rd Switching 230 kV TL	752	80.4	91.1	Loss of Parallel Riverbend Switching – Dixon School Rd Switching 230 kV TL	2	A5*

Scenario Explanations:

1. Lee Combustion Turbine Offline
2. McGuire Unit 1 Offline

*Solutions are presented in Appendix I

Table I.3.3. Potential Solutions for Identified Significant Problems – *DEC*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
1	**Lee Steam – Shady Grove Tie 100 kV TL** Rebuild both Lee Steam – Shady Grove double circuit transmission lines with 1158 ACSS/TW rated at 200°C (24.5 total miles)	2032	$90,000,000
2	**Wateree Switching – Great Falls Switching 100 kV TL** Rebuild the Wateree Switching – Great Falls Switching 100 kV TL with 954 ACSR rated at 120 °C (19.8 miles)	2032	$79,000,000
DEC TOTAL ($2022)			**$169,000,000** (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.

Duke Progress East Balancing Authority Area (DEPE) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.4.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPE*

The following table identifies significant ***DEPE*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPE	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.4.2. Pass 1 – Potential Future Transmission System Impacts – *DEPE*

The following table depicts thermal loadings of ***DEPE*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPE	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.4.3. Potential Solutions for Identified Problems – *DEPE*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEPE TOTAL ($2022)			**$0** (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.

Duke Progress West (DEPW) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.5.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPW*

The following table identifies significant ***DEPW*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPW	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.5.2. Pass 1 – Potential Future Transmission System Impacts – *DEPW*

The following table depicts thermal loadings of ***DEPW*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
DEPW	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.5.3. Potential Solutions for Identified Problems – *DEPW*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEPW TOTAL ($2022)			**$0** (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.

Gulf Power (GP) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.6.1. Pass 0 – Transmission System Impacts with No Enhancements – *GP*

The following table identifies significant ***GP*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.6.2. Pass 1 – Potential Future Transmission System Impacts – *GP*

The following table depicts thermal loadings of ***LG&E/KU*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

<u>Table I.6.3.</u> Potential Solutions for Identified Problems – *GP*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
GP TOTAL ($2022)			**$0** (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.

Louisville Gas & Electric and Kentucky Utilities Balancing Authority Area (LG&E/KU) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.7.1. Pass 0 – Transmission System Impacts with No Enhancements – *LG&E/KU*

The following table identifies significant ***LG&E/KU*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.7.2. Pass 1 – Potential Future Transmission System Impacts – *LG&E/KU*

The following table depicts thermal loadings of ***LG&E/KU*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.7.3. Potential Solutions for Identified Problems – *LGE/KU*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
LGE/KU TOTAL ($2022)			**$0** (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.

PowerSouth (PS) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.8.1. Pass 0 – Transmission System Impacts with No Enhancements – *PS*

The following table identifies significant ***PS*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	With Request	Contingency	Scenario	Project
PS	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.8.2. Pass 1 – Potential Future Transmission System Impacts – *PS*

The following table depicts thermal loadings of ***PS*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
PS	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.8.3. Potential Solutions for Identified Problems – *PS*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
PS TOTAL ($2022)			**$0** (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.

Southern Balancing Authority Area (SBAA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.9.1. Pass 0 – Transmission System Impacts with No Enhancements – *SBAA*

The following table identifies significant **SBAA** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
SBAA	381331 3SIGMAN RD 115.00 381914 3CORNISH MTN 115.00 1	188	95.1	101.1	380096 6CONYERS 230.00 380465 3CONYERS 115.00 1	1	P1
SBAA	380294 3FAIRBURN SW 115.00 380309 3FIFE 115.00 1	79	94.9	103	380023 8WANSLEY 500.00 383034 8HEARD CO 500.00 1	1	NA*
SBAA	380294 3FAIRBURN SW 115.00 380311 3OWENS 1 J 115.00 1	79	95.0	103	380023 8WANSLEY 500.00 383034 8HEARD CO 500.00 1	1	NA*
SBAA	380129 6S COWETA 230.00 380719 3S COWETA B1 115.00 1	437	97.9	103.2	380023 8WANSLEY 500.00 383034 8HEARD CO 500.00 1	1	NA*
SBAA	381129 3HAMMOND B3 115.00 384327 3CENTRESS 115.00 1	112	90.1	101.2	380182 6HAMMOND 230.00 385297 6GOSHENTP 230.00 1	2	NA*
SBAA	380623 3LAGRANGE 3 115.00 380624 3RAGLAND ST 115.00 1	216	88.3	102.3	380124 6LAGRANGE B2 230.00 381594 6DRESDEN 230.00 1	3	NA*
SBAA	380624 3RAGLAND ST 115.00 380625 3LAGRANGE B1 115.00 1	216	89.8	103.5	380124 6LAGRANGE B2 230.00 381594 6DRESDEN 230.00 1	3	NA*
SBAA	381524 3N LAGRANGE 115.00 381590 3MOBLEY BR 115.00 1	155	97.0	120.7	380124 6LAGRANGE B2 230.00 381594 6DRESDEN 230.00 1	3	NA*
SBAA	381525 3HOGANSVL 2J 115.00 381590 3MOBLEY BR 115.00 1	155	90.8	111.5	380124 6LAGRANGE B2 230.00 381594 6DRESDEN 230.00 1	3	NA*
SBAA	380124 6LAGRANGE B2 230.00 381594 6DRESDEN 230.00 1	567	88.6	113.6	380010 8FORTSON 500.00 383033 8TENASKA GA 500.00 1	3	NA*
SBAA	380580 3CLITO 115.00 381483 3DOVER TP 115.00 1	63	93.8	100.2	380572 3MILLEN 115.00 380573 3MILLEN PR 115.00 1	4	NA*

*Project not in current version of models, but is in the 2022 Expansion Plan

Scenario Explanations:

1. No Unit Out of Service
2. McIntosh 10 Unit Out of Service
3. Monroe Unit Out of Service

Scenario Explanations:

4. VC Summer Unit Out of Service

Table I.9.2. Pass 1 – Potential Future Transmission System Impacts – *SBAA*

The following table depicts thermal loadings of ***SBAA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
SBAA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

<u>Table I.9.3.</u> Potential Solutions for Identified Problems – *SBAA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
P1	Rebuild the Sigman Rd – Cornish Mountain 115kV section, approximately 5.3 miles of 100C 636.0 ACSR	2032	$5,130,000
SBAA TOTAL ($2022)			**$5,130,000** (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.

Tennessee Valley Authority Balancing Authority Area (TVA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to DEC	1000 MW	SOCO	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table I.10.1. Pass 0 – Transmission System Impacts with No Enhancements – *TVA*

The following table identifies significant ***TVA*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
TVA	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table I.10.2. Pass 1 – Potential Future Transmission System Impacts – *TVA*

The following table depicts thermal loadings of ***TVA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
TVA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table I.10.3. Potential Solutions for Identified Problems – *TVA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
TVA TOTAL ($2022)			**$0** (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.

2. Study Request 2 Results

Dominion Energy (Formerly South Carolina Electric and Gas) to Duke Energy Carolinas - Summer 2032

1000 MW

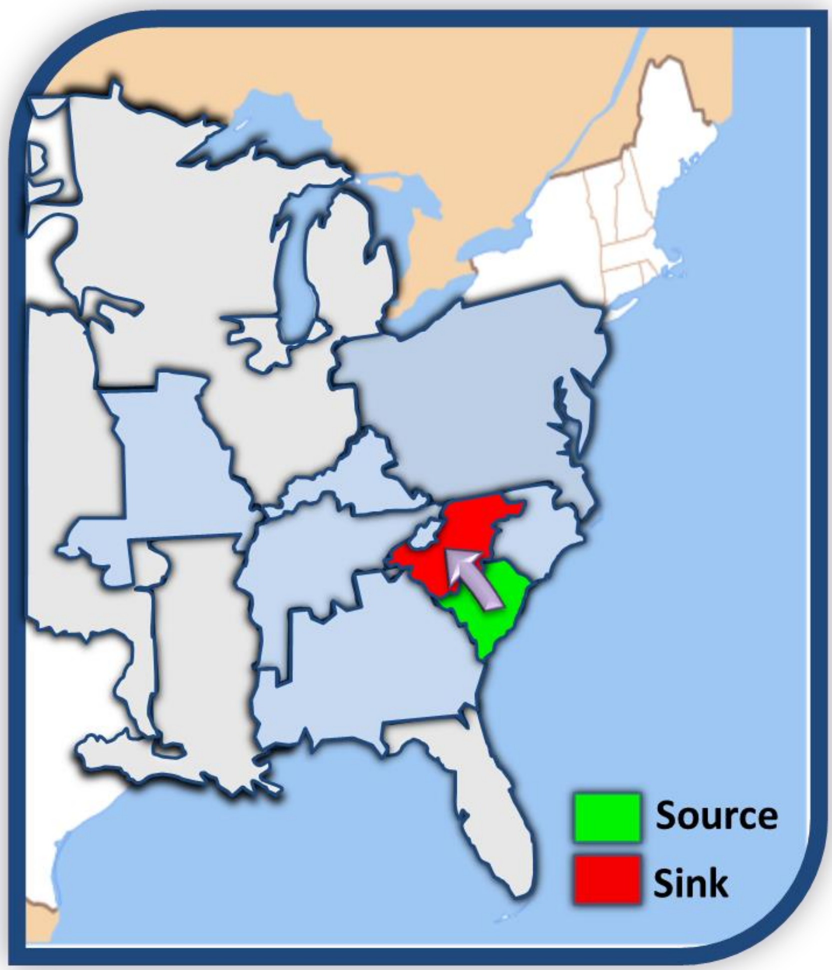
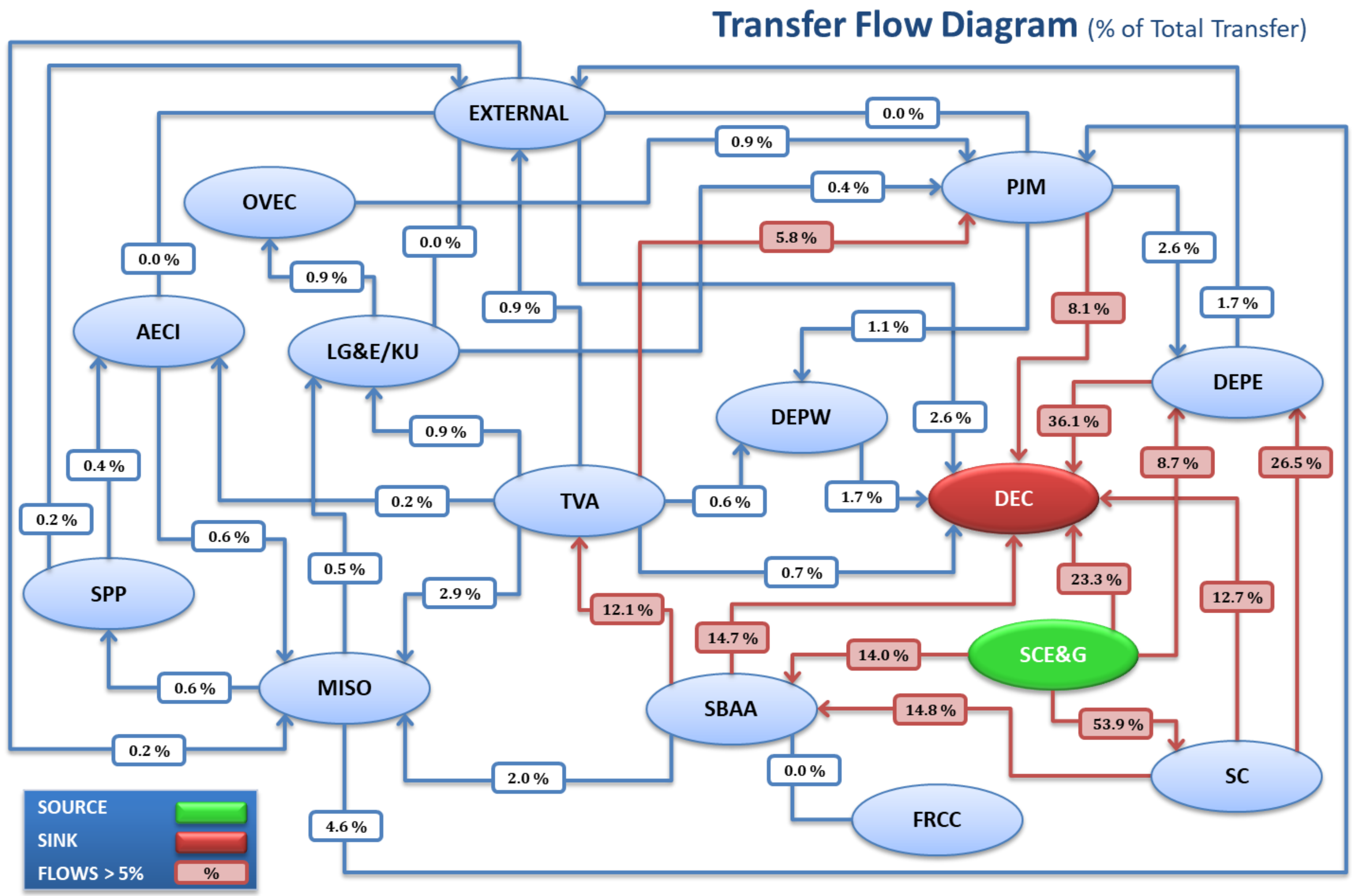


Table II.1.1. Total Cost Identified by the SERTP Sponsors

Balancing Authority Area	Planning Level Cost Estimate
Associated Electric Cooperative (AECI)	$0
Duke Carolinas (DEC)	$221,000,000
Duke Progress East (DEPE)	$0
Duke Progress West (DEPW)	$0
Gulf Power (GP)	$0
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$0
Tennessee Valley Authority (TVA)	$0
TOTAL ($2022)	**$221,000,000**

Diagram II.1.1. **Transfer Flow Diagram (% of Total Transfer)**



Associated Electric Cooperative Balancing Authority Area (AECI) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.2.1. Pass 0 – Transmission System Impacts with No Enhancements – *AECI*

The following table identifies significant ***AECI*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
AECI	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table II.2.2. **Pass 1 – Potential Future Transmission System Impacts – *AECI***

The following table depicts thermal loadings of ***AECI*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	With Request	Contingency	Scenario	Project
AECI	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.2.3. Potential Solutions for Identified Problems – *AECI*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
AECI TOTAL ($2022)			**$0** (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.

Duke Carolinas Balancing Authority Area (DEC) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.3.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEC*

The following table identifies significant ***DEC*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEC	Lee Steam – Shady Grove Tie 100 kV TL (Lee Line)	132	88.1	94.9	Loboe on Lee Steam – Greenbriar Switching Station 100 kV T.L.	1	1
DEC	Lee Steam – Shady Grove Tie 100 kV TL (Piedmont Line)	132	94.5	101.4	Loboe on Lee Steam – Greenbriar Switching Station 100 kV T.L.	1	1
DEC	Clark Hill 115/100 kV Transformer	125	91.4	101.4	Loss of Santee Cooper 115 kV TL	2	2
DEC	Laurens Tie – Bush River Tie 100 kV TL	65	89.5	107.1	Loss of parallel Laurens Tie – Bush River Tie 100 kV TL	2	3
DEC	Wateree Switching – Great Falls Switching	116	89	130.4	Loss of Newport – VC Sumner 230 kV TL	3	4
DEC	Catawba Nuclear – Allen Steam 230 kV TL	1055	92.6	104.6	Loss of Parallel Catawba Nuclear – Allen Steam 230 kV TL	4	NA*

Scenario Explanations:

1. Asheboro unit 7 offline (DEPW)
2. Lee Combustion Turbine Offline
3. Catawba Nuclear Unit 1 Offline
4. McGuire Nuclear Unit 1 Offline

* Project not in current version of models, but is in expansion plan

Table II.3.2. **Pass 1 – Potential Future Transmission System Impacts – *DEC***

The following table depicts thermal loadings of ***DEC*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEC	Lee Combustion – Belton Tie 100 kV TL	132	77.7	90.5	Loss of parallel Lee Combustion – Belton Tie 100 kV TL	2	A1*
DEC	Clark Hill – Thurmond Hydro 115 kV TL	120	80.8	94.1	Base Case	2	A2*
DEC	Central Tie – Shady Grove Tie 230 kV TL	464	87.8	94.1	Loss of parallel Central Tie – Shady Grove Tie 230 kV TL	2	A3*
DEC	Lee Combustion – Toxaway Tie 100 kV TL	105	88.3	94.1	Loss of Parallel Lee Combustion – Toxaway Tie 100 kV TL	2	A4*
DEC	Bush River Tie – Saluda Hydro (DESC) 115 kV TL	79	<70	90.3	Loss of Bush River Tie – VC Sumner Nuclear 230 kV TL	2	A5*
DEC	Riverbend Switching – Dixon School Rd Switching 230 kV TL	752	80.4	90.5	Loss of Parallel Riverbend Switching – Dixon School Rd Switching 230 kV TL	4	A6*

Scenario Explanations:

1. Asheboro unit 7 offline (DEPW)
2. Lee Combustion Turbine Offline
3. Catawba Nuclear Unit 1 Offline
4. McGuire Nuclear Unit 1 Offline

*Solutions are presented in Appendix I

Table II.3.3. Potential Solutions for Identified Problems – *DEC*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
1	**Lee Steam – Shady Grove Tie 100 kV TL** Rebuild both Lee Steam – Shady Grove double circuit transmission lines with 1158 ACSS/TW rated at 200°C (24.5 total miles)	2032	$90,000,000
2	**Clark Hill 115/100 kV Transformer** Upgrade the lowside terminal of the 115/100 kV Transformer to improve rating of transformer	2032	$3,000,000
3	**Laurens Tie – Bush River Tie 100 kV TL** Rebuild the Laurens Tie – Bush River Tie 100 kV TL with 1158 ACSS/TW rated at 200°C (29.25 miles)	2032	$109,000,000
4	**Wateree Switching – Great Falls Switching 100 kV TL** Rebuild the Wateree Switching – Great Falls Switching 100 kV TL with 954 ACSR rated at 120 °C (19.8 miles)	2032	$79,000,000
DEC TOTAL ($2022)			**$221,000,000** (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.

Duke Progress East Balancing Authority Area (DEPE) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.4.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPE*

The following table identifies significant ***DEPE*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPE	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table II.4.2. **Pass 1 – Potential Future Transmission System Impacts – *DEPE***

The following table depicts thermal loadings of ***DEPE*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
DEPE	Shaw AFB Tap - Eastover	123	79.76	104.65	SMTCONT-SUMMRTN230_&_SUMT-WATEREE230	--	NA[1]
DEPE	304532 3VISTA 115 304551 3CASTLH115ET 115 1	179	100.18	101.59	304550 6CASTLEH230T 230 304568 6PORTER TAP 230 1		NA[2]
DEPE	304532 3VISTA 115 305063 3E9-HUGHBATT 115 1	179	96.08	97.49	304550 6CASTLEH230T 230 304568 6PORTER TAP 230 1		NA[3]

Scenario Explanations:

1. Tie line limited by Dominion SC equipment. This is a known issue that is monitored by DEP and Dominion SC
2. DEP project to reconductor Castle Hayne – Folkstone 115 kV Line by 12/2026
3. DEP project to reconductor Castle Hayne – Folkstone 115 kV Line by 12/2026

Table II.4.3. Potential Solutions for Identified Problems – *DEPE*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEPE TOTAL ($2022)			**$0** (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.

Duke Progress West (DEPW) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.5.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPW*

The following table identifies significant ***DEPW*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPW	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table II.5.2. **Pass 1 – Potential Future Transmission System Impacts – *DEPW***

The following table depicts thermal loadings of ***DEPW*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
DEPW	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.5.3. Potential Solutions for Identified Problems – *DEPW*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
DEPW TOTAL ($2022)			**$0** (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.

Gulf Power (GP) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.6.1. Pass 0 – Transmission System Impacts with No Enhancements – *GP*

The following table identifies significant ***GP*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.6.2. Pass 1 – Potential Future Transmission System Impacts – *GP*

The following table depicts thermal loadings of ***GP*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.6.3. Potential Solutions for Identified Problems – *GP*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
GP TOTAL ($2022)			**$0** (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.

Louisville Gas & Electric and Kentucky Utilities Balancing Authority Area (LG&E/KU) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.7.1. Pass 0 – Transmission System Impacts with No Enhancements – *LG&E/KU*

The following table identifies significant ***LG&E/KU*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.7.2. **Pass 1 – Potential Future Transmission System Impacts – *LG&E/KU***

The following table depicts thermal loadings of ***LG&E/KU*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.7.3. Potential Solutions for Identified Problems – *LGE/KU*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
LGE/KU TOTAL ($2022)			**$0** (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.

PowerSouth (PS) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.8.1. Pass 0 – Transmission System Impacts with No Enhancements – *PS*

The following table identifies significant ***PS*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
PS	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table II.8.2. **Pass 1 – Potential Future Transmission System Impacts – *PS***

The following table depicts thermal loadings of ***PS*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
PS	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.8.3. Potential Solutions for Identified Problems – *PS*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
PS TOTAL ($2022)			**$0** (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.

Southern Balancing Authority Area (SBAA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.9.1. Pass 0 – Transmission System Impacts with No Enhancements – *SBAA*

The following table identifies significant ***SBAA*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
SBAA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.9.2. Pass 1 – Potential Future Transmission System Impacts – *SBAA*

The following table depicts thermal loadings of ***SBAA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
SBAA							--

Scenario Explanations:

1. N/A

Table II.9.3. Potential Solutions for Identified Problems – *SBAA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
SBAA TOTAL ($2022)			**$0** (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.

Tennessee Valley Authority Balancing Authority Area (TVA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DESC (SCEG) to DEC	1000 MW	DESC (SCEG)	DEC	2032
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table II.10.1. Pass 0 – Transmission System Impacts with No Enhancements – *TVA*

The following table identifies significant ***TVA*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
TVA	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table II.10.2. **Pass 1 – Potential Future Transmission System Impacts – *TVA***

The following table depicts thermal loadings of ***TVA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
TVA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table II.10.3. Potential Solutions for Identified Problems – *TVA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
TVA TOTAL ($2022)			**$0** (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.

3. Study Request 3 Results

Southern Company to Santee Cooper - Winter 2027

600 MW

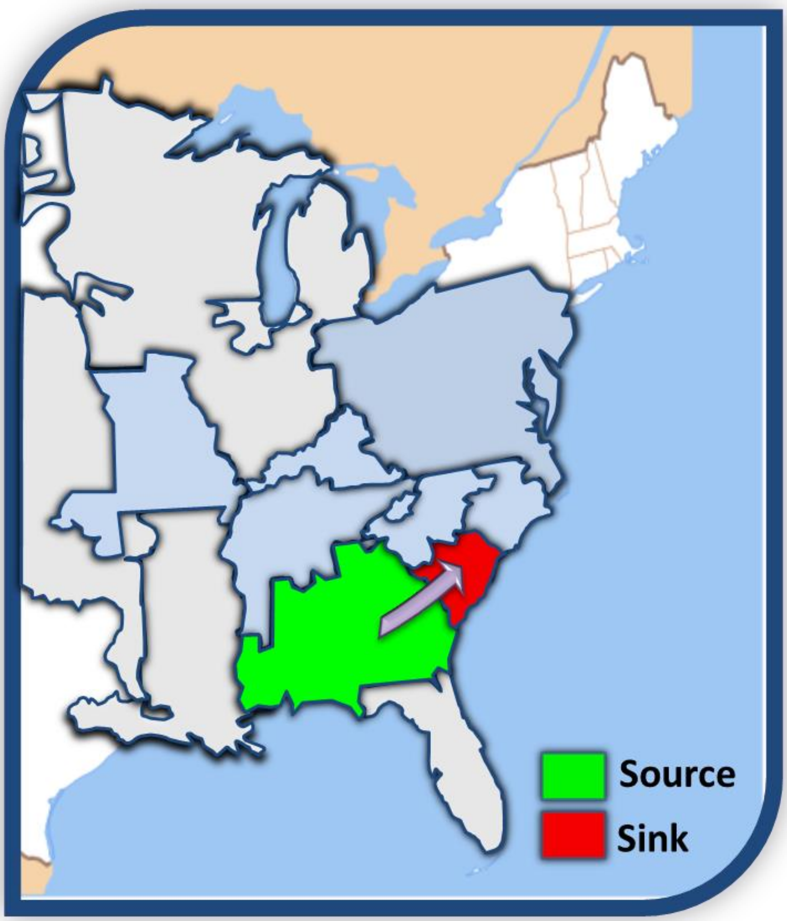
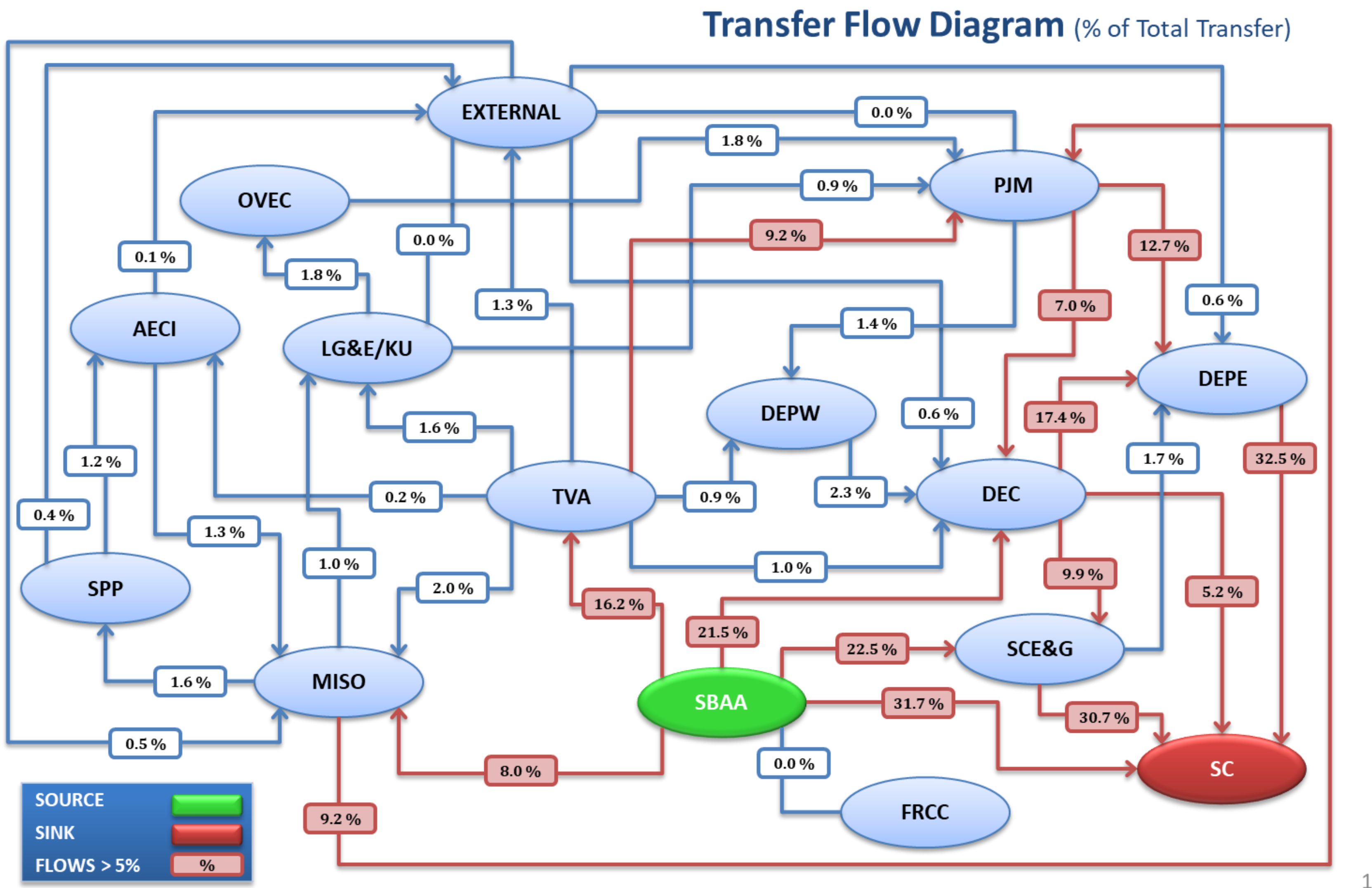


Table III.1.1. **Total Cost Identified by the SERTP Sponsors**

Balancing Authority Area	Planning Level Cost Estimate
Associated Electric Cooperative (AECI)	**$0**
Duke Carolinas (DEC)	**$0**
Duke Progress East (DEPE)	**$0**
Duke Progress West (DEPW)	**$0**
Gulf Power (GP)	**$0**
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	**$0**
PowerSouth (PS)	**$0**
Southern (SBAA)	**$0**
Tennessee Valley Authority (TVA)	**$0**
TOTAL ($2022)	**$0**

<u>Diagram III.1.1.</u> Transfer Flow Diagram (% of Total Transfer)



Associated Electric Cooperative Balancing Authority Area (AECI) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.2.1. Pass 0 – Transmission System Impacts with No Enhancements – *AECI*

The following table identifies significant ***AECI*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
AECI	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

<u>Table III.2.2.</u> Pass 1 – Potential Future Transmission System Impacts – *AECI*

The following table depicts thermal loadings of ***AECI*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
AECI	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.2.3. Potential Solutions for Identified Problems – *AECI*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
AECI TOTAL ($2022)			**$0** (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.

Duke Carolinas Balancing Authority Area (DEC) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.3.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEC*

The following table identifies significant ***DEC*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEC	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.3.2. **Pass 1 – Potential Future Transmission System Impacts – *DEC***

The following table depicts thermal loadings of ***DEC*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEC	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.3.3. Potential Solutions for Identified Problems – *DEC*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEC TOTAL ($2022)			**$0** (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.

Duke Progress East Balancing Authority Area (DEPE) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.4.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPE*

The following table identifies significant ***DEPE*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
DEPE	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table III.4.2. **Pass 1 – Potential Future Transmission System Impacts – *DEPE***

The following table depicts thermal loadings of ***DEPE*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
DEPE	304566 3IND 304566 115 304583 3DELCO115E T 115 1	159	98.58	98.53	304035 3SUTTON115 T 115 304560 3IND 304560 115 1	--	NA[1]

Scenario Explanations:

1. Uprates to the Delco terminal of the Sutton Plant – Delco 115 kV Line will resolve issue by 2022

Table III.4.3. Potential Solutions for Identified Problems – *DEPE*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEPE TOTAL ($2022)			**$0** (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.

Duke Progress West (DEPW) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.5.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPW*

The following table identifies significant ***DEPW*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
DEPW	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table III.5.2. Pass 1 – Potential Future Transmission System Impacts – *DEPW*

The following table depicts thermal loadings of ***DEPW*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
DEPW	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.5.3. Potential Solutions for Identified Problems – *DEPW*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEPW TOTAL ($2022)			**$0** (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.

Gulf Power (GP) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.6.1. Pass 0 – Transmission System Impacts with No Enhancements – *GP*

The following table identifies significant ***GP*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

<u>Table III.6.2.</u> Pass 1 – Potential Future Transmission System Impacts – *GP*

The following table depicts thermal loadings of ***GP*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.6.3. Potential Solutions for Identified Problems – *GP*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
GP TOTAL ($2022)			**$0** (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.

Louisville Gas & Electric and Kentucky Utilities Balancing Authority Area (LG&E/KU) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.7.1. Pass 0 – Transmission System Impacts with No Enhancements – *LG&E/KU*

The following table identifies significant ***LG&E/KU*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.7.2. **Pass 1 – Potential Future Transmission System Impacts – *LG&E/KU***

The following table depicts thermal loadings of ***LG&E/KU*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.7.3. Potential Solutions for Identified Problems – *LGE/KU*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
LGE/KU TOTAL ($2022)			**$0** (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.

PowerSouth (PS) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.8.1. Pass 0 – Transmission System Impacts with No Enhancements – *PS*

The following table identifies significant ***PS*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
PS	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table III.8.2. Pass 1 – Potential Future Transmission System Impacts – *PS*

The following table depicts thermal loadings of ***PS*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	Limiting Element	Rating (MVA)	Without Request	With Request	Contingency	Scenario	Project
PS	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.8.3. Potential Solutions for Identified Problems – *PS*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
PS TOTAL ($2022)			**$0** (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.

Southern Balancing Authority Area (SBAA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.9.1. Pass 0 – Transmission System Impacts with No Enhancements – *SBAA*

The following table identifies significant ***SBAA*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
SBAA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.9.2. Pass 1 – Potential Future Transmission System Impacts – *SBAA*

The following table depicts thermal loadings of ***SBAA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
SBAA							--

Scenario Explanations:

1. N/A

Table III.9.3. Potential Solutions for Identified Problems – *SBAA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
SBAA TOTAL ($2022)			**$0** (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.

Tennessee Valley Authority Balancing Authority Area (TVA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	600 MW	SOCO	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table III.10.1. Pass 0 – Transmission System Impacts with No Enhancements – *TVA*

The following table identifies significant ***TVA*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
TVA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.10.2. **Pass 1 – Potential Future Transmission System Impacts – *TVA***

The following table depicts thermal loadings of ***TVA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
TVA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table III.10.3. Potential Solutions for Identified Problems – *TVA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
TVA TOTAL ($2022)			**$0** (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.

4. Study Request 4 Results

Southern Company to Santee Cooper - Summer 2024

500 MW

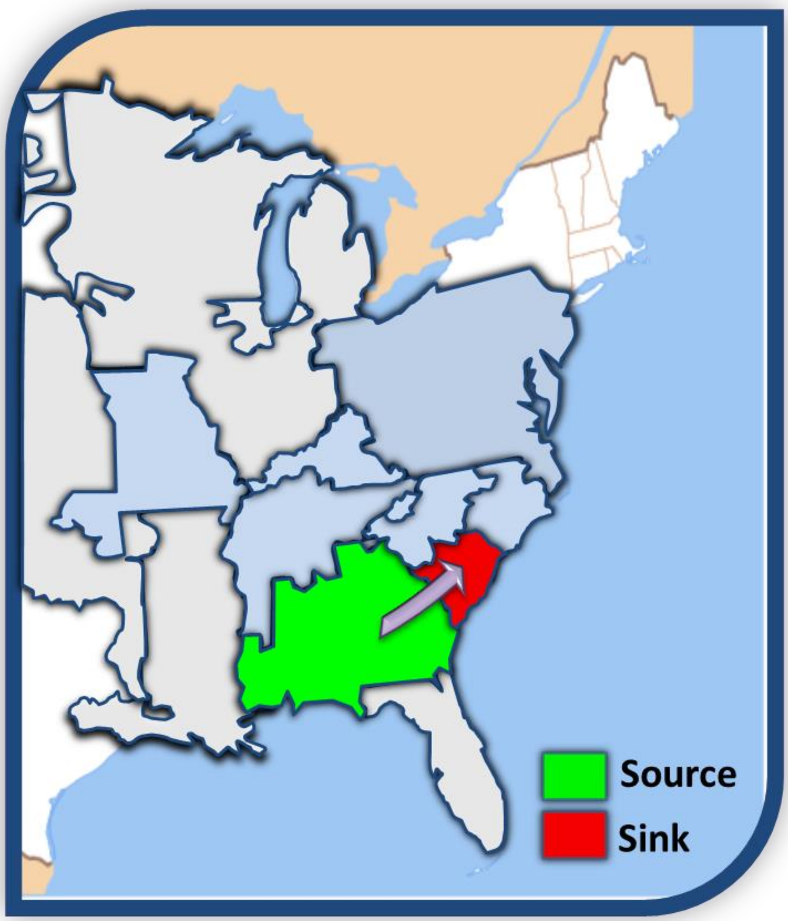
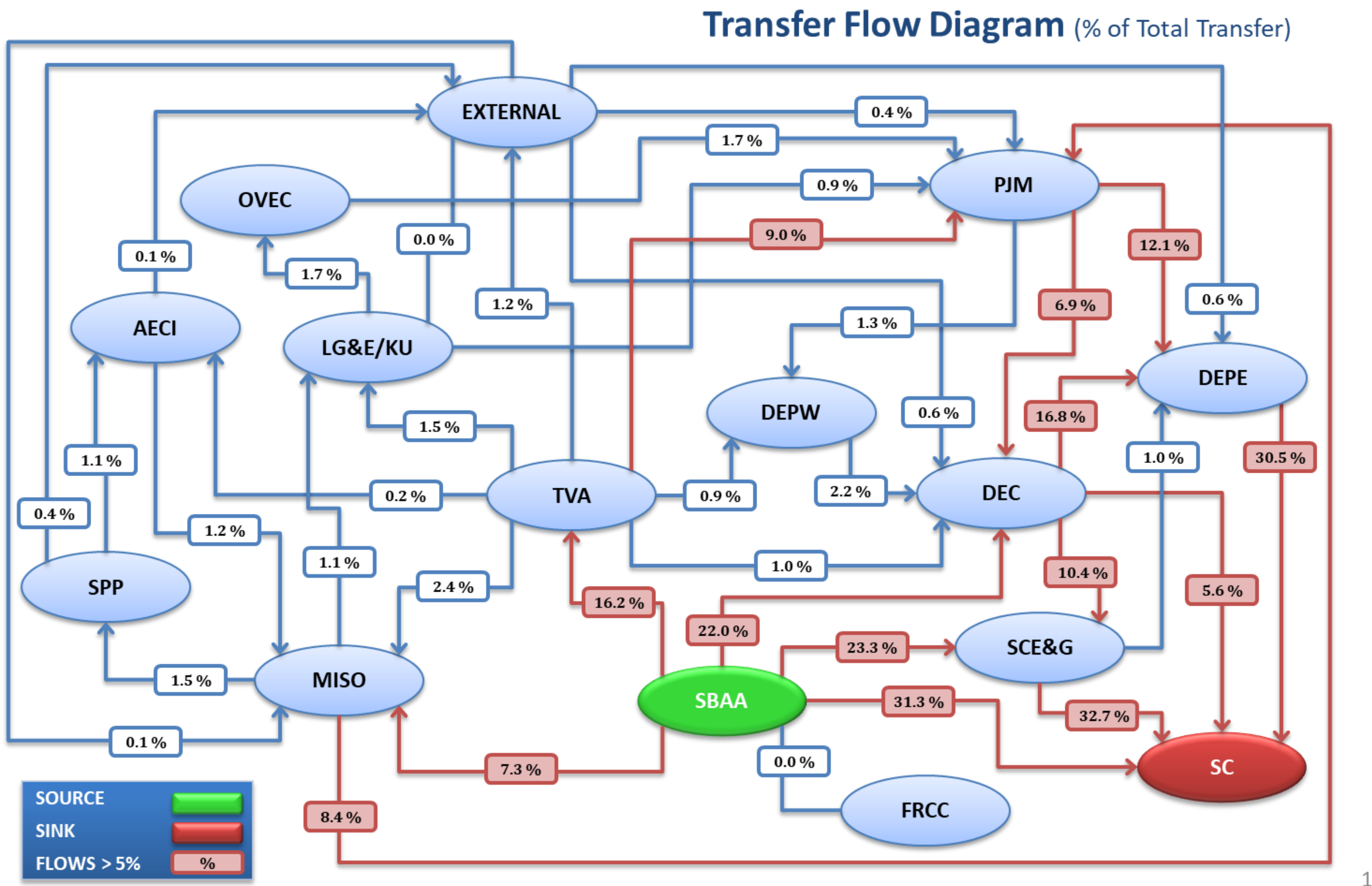


Table IV.1.1. Total Cost Identified by the SERTP Sponsors

Balancing Authority Area	Planning Level Cost Estimate
Associated Electric Cooperative (AECI)	$0
Duke Carolinas (DEC)	$0
Duke Progress East (DEPE)	$0
Duke Progress West (DEPW)	$0
Gulf Power (GP)	$0
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$39,218,000
Tennessee Valley Authority (TVA)	$0
TOTAL ($2022)	**$39,218,000**

Diagram IV.1.1. Transfer Flow Diagram (% of Total Transfer)



Associated Electric Cooperative Balancing Authority Area (AECI) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.2.1. Pass 0 – Transmission System Impacts with No Enhancements – *AECI*

The following table identifies significant ***AECI*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
AECI	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table IV.2.2. Pass 1 – Potential Future Transmission System Impacts – *AECI*

The following table depicts thermal loadings of ***AECI*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
AECI	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.2.3. Potential Solutions for Identified Problems – *AECI*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
AECI TOTAL ($2022)			**$0** (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.

Duke Carolinas Balancing Authority Area (DEC) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.3.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEC*

The following table identifies significant ***DEC*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEC	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

<u>Table IV.3.2.</u> Pass 1 – Potential Future Transmission System Impacts – *DEC*

The following table depicts thermal loadings of ***DEC*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
DEC	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.3.3. Potential Solutions for Identified Problems – *DEC*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEC TOTAL ($2022)			**$0** (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.

Duke Progress East Balancing Authority Area (DEPE) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.4.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPE*

The following table identifies significant ***DEPE*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPE	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table IV.4.2. Pass 1 – Potential Future Transmission System Impacts – *DEPE*

The following table depicts thermal loadings of ***DEPE*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
DEPE	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.4.3. Potential Solutions for Identified Problems – *DEPE*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
DEPE TOTAL ($2022)			**$0** (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.

Duke Progress West (DEPW) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.5.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPW*

The following table identifies significant ***DEPW*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPW	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table IV.5.2. Pass 1 – Potential Future Transmission System Impacts – *DEPW*

The following table depicts thermal loadings of ***DEPW*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
DEPW	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.5.3. Potential Solutions for Identified Problems – *DEPW*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
DEPW TOTAL ($2022)			**$0** (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.

Gulf Power (GP) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.6.1. Pass 0 – Transmission System Impacts with No Enhancements – *GP*

The following table identifies significant ***GP*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.6.2. Pass 1 – Potential Future Transmission System Impacts – *GP*

The following table depicts thermal loadings of ***GP*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.6.3. Potential Solutions for Identified Problems – *GP*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
GP TOTAL ($2022)			**$0** (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.

Louisville Gas & Electric and Kentucky Utilities Balancing Authority Area (LG&E/KU) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.7.1. Pass 0 – Transmission System Impacts with No Enhancements – *LG&E/KU*

The following table identifies significant ***LG&E/KU*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	With Request	Contingency	Scenario	Project
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.7.2. Pass 1 – Potential Future Transmission System Impacts – *LG&E/KU*

The following table depicts thermal loadings of ***LG&E/KU*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.7.3. Potential Solutions for Identified Problems – *LGE/KU*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
LGE/KU TOTAL ($2022)			**$0** (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.

PowerSouth (PS) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.8.1. Pass 0 – Transmission System Impacts with No Enhancements – *PS*

The following table identifies significant ***PS*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
PS	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table IV.8.2. Pass 1 – Potential Future Transmission System Impacts – *PS*

The following table depicts thermal loadings of ***PS*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
PS	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.8.3. Potential Solutions for Identified Problems – *PS*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
PS TOTAL ($2022)			**$0** (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.

Southern Balancing Authority Area (SBAA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.9.1. Pass 0 – Transmission System Impacts with No Enhancements – *SBAA*

The following table identifies significant ***SBAA*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
SBAA	380623 3LAGRANGE 3 115.00 380624 3RAGLAND ST 115.00 1	155	97.8	105.9	380023 8WANSLEY 500.00 383034 8HEARD CO 500.00 1	1	NA*
SBAA	380624 3RAGLAND ST 115.00 380625 3LAGRANGE B1 115.00 1	155	99	106.9	380023 8WANSLEY 500.00 383034 8HEARD CO 500.00 1	1	NA*
SBAA	380160 6HATCH 230.00 382102 6HATCH SS 2 230.00 1	509	<90	108.2	380009 8W MCINTOSH 500.00 382158 8MCCALL RD 500.00 1	3	P1
SBAA	382102 6HATCH SS 2 230.00 382361 6VIDALIA B2 230.00 1	509	<90	107.0	380009 8W MCINTOSH 500.00 382158 8MCCALL RD 500.00 1	3	P1

*Project not in current version of models, but is in the 2022 Expansion Plan

Scenario Explanations:

1. McDonough 4 Unit Out
2. Vogtle 2 Unit Out

Table IV.9.2. Pass 1 – Potential Future Transmission System Impacts – *SBAA*

The following table depicts thermal loadings of ***SBAA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
SBAA	382408 3ETOWAH 115.00 382435 3REAVIS MTN 115.00 1	124	90.2	98.1	380335 6DAWSON CROS 230.00 381117 6MCGRAU F B2 230.00 1	1	--

Scenario Explanations:

1. McIntosh 10 Unit Out

Table IV.9.3. Potential Solutions for Identified Problems – *SBAA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
P2	Rebuild the Hatch – Vidalia 230kV line, approximately 23.1 miles of 100C 1033.5 ACSR	2024	$39,218,000
SBAA TOTAL ($2022)			**$39,218,000** (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.

Tennessee Valley Authority Balancing Authority Area (TVA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
SOCO to SC	500 MW	SOCO	SC	2024
Load Flow Cases				
2022 Series Version 1 SERTP Models: Summer Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table IV.10.1. Pass 0 – Transmission System Impacts with No Enhancements – *TVA*

The following table identifies significant ***TVA*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
TVA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table IV.10.2. Pass 1 – Potential Future Transmission System Impacts – *TVA*

The following table depicts thermal loadings of ***TVA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
TVA	None Identified	--	--	--	--	--	--

Scenario Explanations:
1. N/A

<u>Table IV.10.3.</u> Potential Solutions for Identified Problems – *TVA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
TVA TOTAL ($2022)			**$0** (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.

5. Study Request 5 Results

Duke Energy Carolinas to Santee Cooper - Winter 2027

600 MW

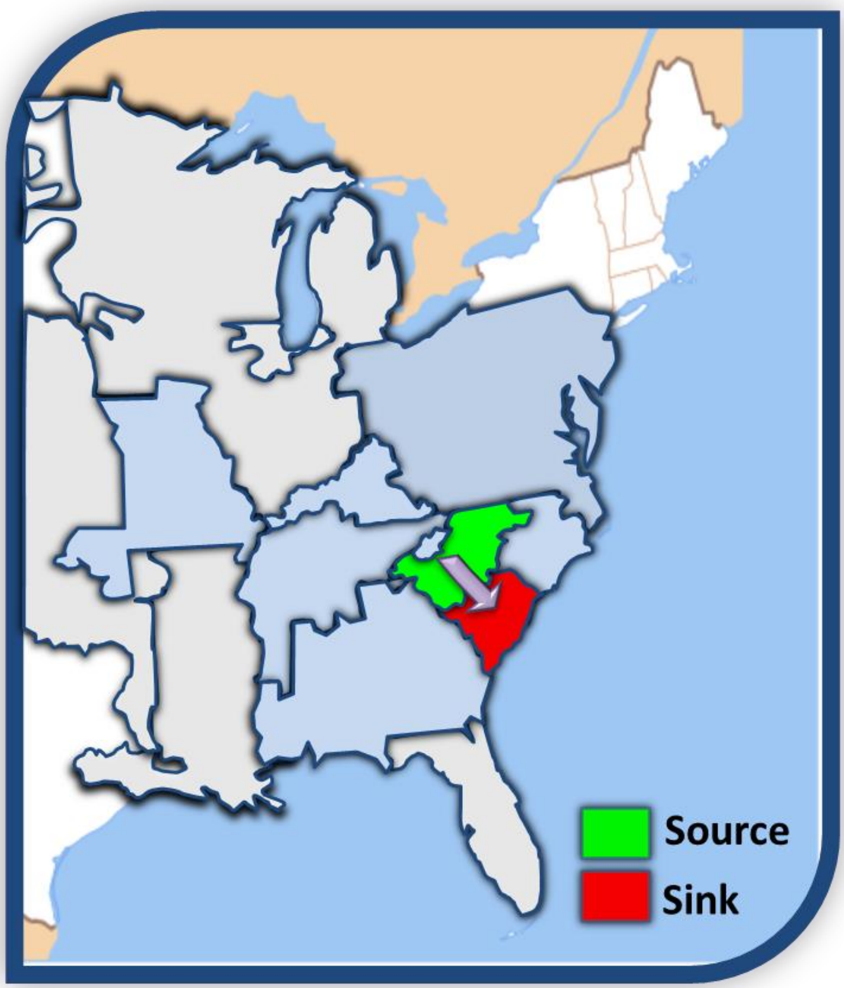
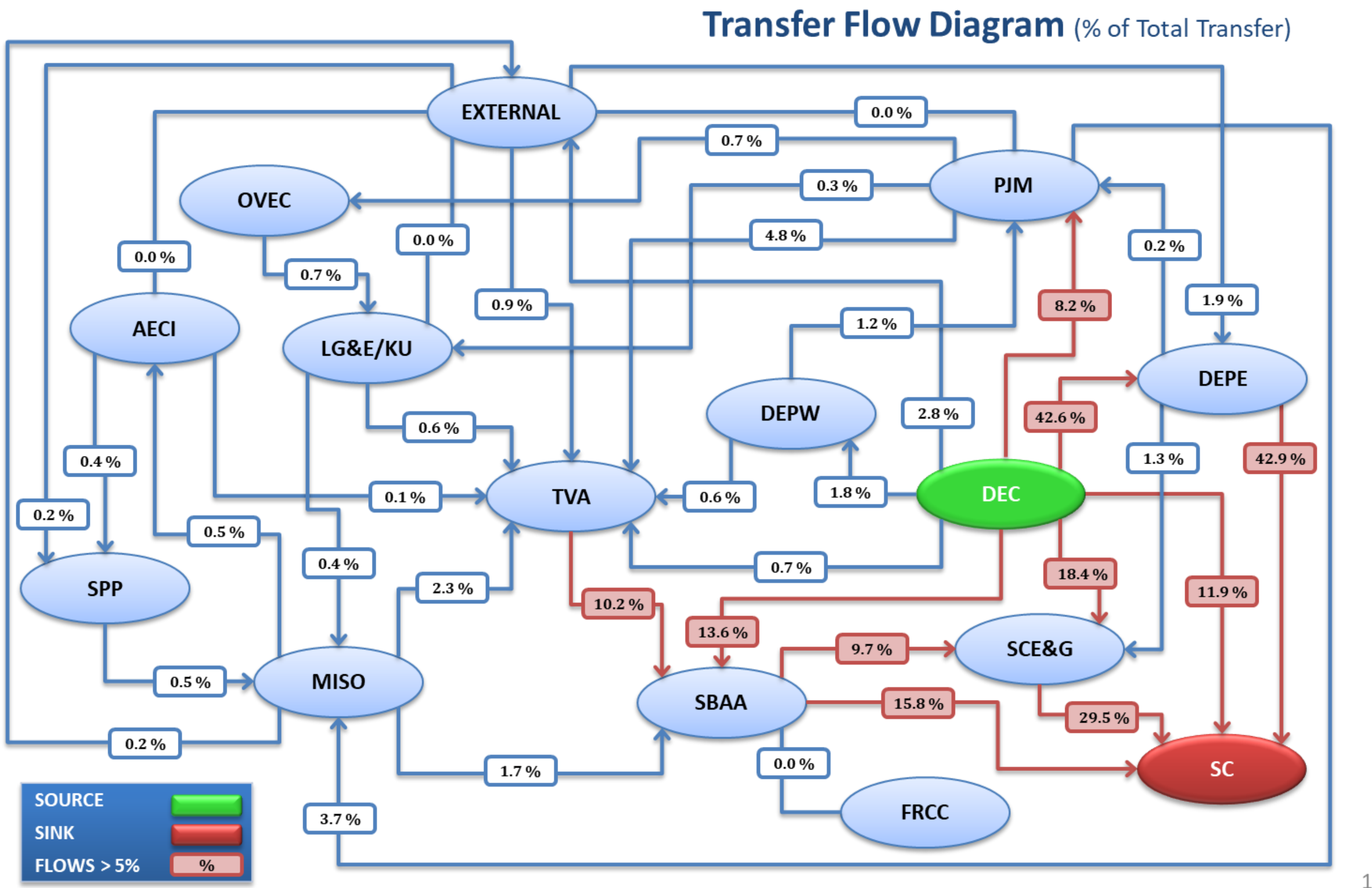


Table V.1.1. Total Cost Identified by the SERTP Sponsors

Balancing Authority Area	Planning Level Cost Estimate
Associated Electric Cooperative (AECI)	$0
Duke Carolinas (DEC)	$0
Duke Progress East (DEPE)	$0
Duke Progress West (DEPW)	$0
Gulf Power (GP)	$0
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$0
Tennessee Valley Authority (TVA)	$0
TOTAL ($2022)	**$0**

Diagram V.1.1. **Transfer Flow Diagram (% of Total Transfer)**



Associated Electric Cooperative Balancing Authority Area (AECI) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.2.1. Pass 0 – Transmission System Impacts with No Enhancements – *AECI*

The following table identifies significant ***AECI*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
AECI	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table V.2.2. Pass 1 – Potential Future Transmission System Impacts – *AECI*

The following table depicts thermal loadings of ***AECI*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
AECI	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.2.3. Potential Solutions for Identified Problems – *AECI*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
AECI TOTAL ($2022)			**$0** (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.

Duke Carolinas Balancing Authority Area (DEC) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.3.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEC*

The following table identifies significant ***DEC*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEC	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.3.2. Pass 1 – Potential Future Transmission System Impacts – *DEC*

The following table depicts thermal loadings of ***DEC*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEC	Oakboro Tie – Harrisburg Tie 230 kV TL	464	86.6	94.8	Loss of Parallel Oakboro Tie – Harrisburg Tie 230 kV TL	1	A1*

Scenario Explanations:

1. VACAR Reserve Share Cases

*Solutions are presented in Appendix I

Table V.3.3. Potential Solutions for Identified Problems – *DEC*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEC TOTAL ($2022)			**$0** (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.

Duke Progress East Balancing Authority Area (DEPE) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.4.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPE*

The following table identifies significant ***DEPE*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	With Request	Contingency	Scenario	Project
DEPE	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table V.4.2. **Pass 1 – Potential Future Transmission System Impacts – *DEPE***

The following table depicts thermal loadings of ***DEPE*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPE	304435 3MAXTON 115 304440 3IND 304440 115 1	120	98.94	98.98	304047 3WSPOON115 T 115 305099 3E10-WESTLUM 115 1	--	NA[1]

Scenario Explanations:

1. DEP project to reconductor section by 2022

Table V.4.3. Potential Solutions for Identified Problems – *DEPE*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEPE TOTAL ($2022)			**$0** (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.

Duke Progress West (DEPW) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.5.1. Pass 0 – Transmission System Impacts with No Enhancements – *DEPW*

The following table identifies significant ***DEPW*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
DEPW	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

Table V.5.2. Pass 1 – Potential Future Transmission System Impacts – *DEPW*

The following table depicts thermal loadings of ***DEPW*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
DEPW	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.5.3. Potential Solutions for Identified Problems – *DEPW*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
DEPW TOTAL ($2022)			**$0** (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.

Gulf Power (GP) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.6.1. Pass 0 – Transmission System Impacts with No Enhancements – *GP*

The following table identifies significant ***GP*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.6.2. **Pass 1 – Potential Future Transmission System Impacts – *GP***

The following table depicts thermal loadings of ***GP*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
GP	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.6.3. **Potential Solutions for Identified Problems – *GP***

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
GP TOTAL ($2022)			**$0** (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.

Louisville Gas & Electric and Kentucky Utilities Balancing Authority Area (LG&E/KU) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.7.1. Pass 0 – Transmission System Impacts with No Enhancements – *LG&E/KU*

The following table identifies significant ***LG&E/KU*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.7.2. Pass 1 – Potential Future Transmission System Impacts – *LG&E/KU*

The following table depicts thermal loadings of ***LG&E/KU*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
LG&E/KU	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.7.3. Potential Solutions for Identified Problems – *LGE/KU*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
LGE/KU TOTAL ($2022)			**$0** (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.

PowerSouth (PS) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.8.1. Pass 0 – Transmission System Impacts with No Enhancements – *PS*

The following table identifies significant ***PS*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
PS	None Identified	–	–	–	–	–	–

Scenario Explanations:

1. N/A

<u>Table V.8.2.</u> Pass 1 – Potential Future Transmission System Impacts – *PS*

The following table depicts thermal loadings of ***PS*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
PS	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.8.3. Potential Solutions for Identified Problems – *PS*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
AECI TOTAL ($2022)			**$0** (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.

Southern Balancing Authority Area (SBAA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.9.1. Pass 0 – Transmission System Impacts with No Enhancements – *SBAA*

The following table identifies significant ***SBAA*** thermal constraints without any enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%) Without Request	Thermal Loadings (%) With Request	Contingency	Scenario	Project
SBAA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.9.2. **Pass 1 – Potential Future Transmission System Impacts – *SBAA***

The following table depicts thermal loadings of ***SBAA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
SBAA							--

Scenario Explanations:

1. N/A

Table V.9.3. Potential Solutions for Identified Problems – *SBAA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	None Required	--	--
SBAA TOTAL ($2022)			**$0** (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.

Tennessee Valley Authority Balancing Authority Area (TVA) Results

Study Structure and Assumptions

Transfer Sensitivity	Amount	Source	Sink	Year
DEC to SC	600 MW	DEC	SC	2027
Load Flow Cases				
2022 Series Version 1 SERTP Models: Winter Peak				

Transmission System Impacts

The following tables below identify any constraints attributable to the requested transfer for the contingency and scenario that resulted in the most significant loadings for the conditions studied. Other unit out scenarios or contingencies may also result in constraints to these or other facilities.

Table V.10.1. Pass 0 – Transmission System Impacts with No Enhancements – *TVA*

The following table identifies significant ***TVA*** thermal constraints without any enhancements to the transmission system.

			Thermal Loadings (%)				
Area	**Limiting Element**	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
TVA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

Table V.10.2. **Pass 1 – Potential Future Transmission System Impacts – *TVA***

The following table depicts thermal loadings of ***TVA*** transmission facilities that could become potential constraints in future years or with different queuing assumptions but are not overloaded in the study year with all proposed enhancements to the transmission system.

Area	Limiting Element	Rating (MVA)	Thermal Loadings (%)		Contingency	Scenario	Project
			Without Request	With Request			
TVA	None Identified	--	--	--	--	--	--

Scenario Explanations:

1. N/A

<u>Table V.10.3.</u> Potential Solutions for Identified Problems – *TVA*

The following table lists any potential solutions that were identified to address the significant thermal constraints in order to meet the request and assumptions used in the study. It must be noted that changes to the load forecast, and/or changes in the expansion plan could occur and would impact the results of this study. In addition, the currently projected improvements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission expansion plans could also impact the results of this study.

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
--	**None Required**	--	--
TVA TOTAL ($2022)			**$0** (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.

6. Appendix I

The additional solution information below is provided for the DEC balancing authority only, for each of the stakeholder requested transfers included in the Economic Planning Studies performed in 2022. While this optional information is not required by the tariff, it illustrates the potential issues that may be present in future years if large transfers of this nature are requested.

These potential solutions and estimated need dates represent the extrapolation beyond the traditional 10-year study timeframe of DEC facilities that were identified as 90% or greater of the thermal rating in the 2022 studies. It is important to note that there may be additional constraints that could be identified in models for years beyond the specific study year used for these evaluations.

The solutions listed are provided as information only and do not represent any commitment to build.

Table A.1. Solutions for Identified Potential Problems for Study 1: 1000 MW SOCO - DEC

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
A1	**Lee Combustion – Belton Tie 100 kV TL** Rebuild the Lee Combustion – Belton Tie 100 kV TL with 1272 ACSR rated at 120 °C (6.4 miles)	2039	$26,000,000
A2	**Clark Hill 115/100 kV Transformer** Upgrade the lowside terminal of the 115/100 kV Transformer to improve rating of transformer	2035	$3,000,000
A3	**Central Tie – Shady Grove Tie 230 kV TL** Reconductor the Central Tie – Shady Grove Tie 230 kV TL with 1158 ACSS/TW rated at 200°C (17.8 Miles)	2038	$89,000,000
A4	**Lee Combustion – Toxaway Tie 100 kV TL** Rebuild the Lee Combustion – Toxaway Tie 100kV TL with 1272 ACSR rated at 120 °C (13.5 miles)	2034	$54,000,000
A5	**Riverbend Switching – Dixon School Rd Switching 230 kV TL** Upgrade the terminal at Riverbend Switching Station of the Riverbend Switching – Dixon School Rd Switching 230 kV TL to increase the rating of the line	2040	$5,000,000
DEC TOTAL ($2022)			**$177,000,000** (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.

Table A.2 Solutions for Identified Potential Problems for Study 2: 1000 MW DESC(SCEG) - DEC

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
A1	**Lee Combustion – Belton Tie 100 kV TL** Rebuild the Lee Combustion – Belton Tie 100 kV TL with 1272 ACSR rated at 120 °C (6.4 miles)	2039	$26,000,000
A2	**Clark Hill – Thurmond Hydro 115 kV TL** Rebuild the Clark Hill – Thurmond Hydro 115 kV TL with 954 ACSR rated at 120 °C (36 miles)	2038	$144,000,000
A3	**Central Tie – Shady Grove Tie 230 kV TL** Reconductor the Central Tie – Shady Grove Tie 230 kV TL with 1158 ACSS/TW rated at 200°C (17.8 Miles)	2038	$89,000,000
A4	**Lee Combustion – Toxaway Tie 100 kV TL** Rebuild the Lee Combustion – Toxaway Tie 100kV TL with 1272 ACSR rated at 120 °C (13.5 miles)	2038	$54,000,000
A5	**Bush River Tie – Saluda Hydro (DESC) 115 kV TL** Rebuild the Bush River Tie – Saluda Hydro (DESC) 115 kV TL with 954 ACSR rated at 120 °C (11.35 Miles)	2041	$42,000,000
A6	**Lee Combustion – Belton Tie 100 kV TL** Rebuild the Lee Combustion – Belton Tie 100 kV TL with 1272 ACSR rated at 120 °C (6.4 miles)	2039	$26,000,000
DEC TOTAL ($2022)			**$381,000,000** (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.

Table A.3 Solutions for Identified Potential Problems for Study 5: 600 MW DEC - SC

Item	Potential Solution	Estimated Need Date	Planning Level Cost Estimate
A1	**Oakboro Tie – Harrisburg Tie 230 kV TL** Rebuild the Oakboro Tie – Harrisburg Tie 230 kV TL with bundled 1272 ACSR conductor rated at 120 °C (21.6 miles)	2039	$108,000,000
DEC TOTAL ($2022)			**$108,000,000** (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.