Southeastern Regional Transmission Planning Process

2009 Economic Sensitivity Requests Final Results

December 4, 2009

Georgia to Peninsular Florida[1] ("PF")

650 MW

[1] As defined in Attachment C of Southern Operating Companies' Open Access Transmission Tariff ("Tariff").

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Study Structure and Assumptions

Transfer Sensitivity	Transfer Amount	Transfer Source	Transfer Sink	Study Year
Georgia to PF	650 MW	Northwest Georgia	PF	2014
Load Flow Cases				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to Florida Reliability Coordinating Council ("FRCC"), Summer Peak with 3600 MW Interchange to FRCC, and Shoulder Cases				
Source Modeled				
The source for this transfer was assumed to be a new generator tapping the existing Conasauga – Mostellar Springs 500 kV Transmission Line in northwest Georgia.				

Transmission System Impacts

Table 1 below identifies thermal constraints associated with the requested transfer of power for selected generation-out conditions. Other unit out conditions may also result in constraints to these or other facilities. The loadings listed in Table 1 represent the worst identified contingency and scenario for each limiting facility for the conditions studied. Other contingency and scenario conditions may also result in loadings greater than 100%.

Table 1. Transmission System Impacts – *Southern Balancing Authority*

		Thermal Loadings %				
Limiting Element	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
The following constraints have been identified as directly attributable to the above defined transfer						
1099 N JESUP 115 1100 RAYONIER 115 1	124	88.9	106.5	15 THALMANN 500 2158 MCCALL RD 500 1	5	OG
1507 ASHBURNJ 115 2524 DOLES J 115 1	63	96.7	105.9	24 N TIFTON 500 222 N TIFTON 230 1	3	P1
1044 DOUGLAS 115 1074 OAK PARK 115 1	100	98.1	105.5	223 DOUGLAS 230 1810 WILSONVILLE 230 1	4	P2
15 THALMANN 500 400356 DUVAL 500 1	2598	84.6	105.3	14 HATCH 500 400356 DUVAL 500 1	2	P3
746 SGRIFFIN 115 750 GABRDCR3 115 1	78	99.6	104.9	462 PORTERDALE 115 1917 S COV J 115 1	3	P4
220 PINE GROVE 230 1870 STERL PULP 230 1	497	85.6	104.3	15 THALMANN 500 400356 DUVAL 500 1	2	P7
1883 ADEL 1J 115 1884 S ADEL J 115 1	124	93.3	103.3	220 PINE GROVE 230 222 N TIFTON 230 1	2	P5
681 MITCHELL 115 682 LESTER 115 1	124	97.4	103.0	24 N TIFTON 500 222 N TIFTON 230 1	3	P6
17290 BAYSP J 115 17295 SLOC JCT 115 1	134	99.6	102.3	4601 FARLEY 6 230 5518 COTONWD6 230 1	2	OG
1085 KETTLECK PR 115 1863 MANOR 115 1	97	88.6	101.7	15 THALMANN 500 400356 DUVAL 500 1	2	P7
208 NELSON 230 954 NELSON 115 1	180	99.2	101.3	208 NELSON 230 954 NELSON 115 2	1	OG

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Limiting Element	Rating (MVA)	Thermal Loadings % Without Request	Thermal Loadings % With Request	Contingency	Scenario	Project
The following facilities could become potential constraints in future years or with different queuing assumptions						
24 N TIFTON 500 222 N TIFTON 230 1	1536	95.3	98.1	2500 RACCOON CK 500 2510 RACCOON CK 230 1	2	—
14 HATCH 500 400356 DUVAL 500 1	2598	78.4	97.9	15 THALMANN 500 400356 DUVAL 500 1	5	—
220 PINE GROVE 230 1885 W VALDOSTA 230 1	509	86.9	96.8	220 PINE GROVE 230 222 N TIFTON 230 1	5	—
14 HATCH 500 400356 DUVAL 500 1	2598	75.8	96.6	15 THALMANN 500 400356 DUVAL 500 1	2	—
220 PINE GROVE 230 222 N TIFTON 230 1	509	85.2	92.7	220 PINE GROVE 230 1885 W VALDOSTA 230 1	6	—

Scenario Explanations:

1 – Athens CTs Unit out – Summer Peak with 2250 MW Interchange to FRCC
2 – Smith 3 unit out – Summer Peak with 3600 MW Interchange to FRCC
3 – Hatch 1 unit out – Summer Peak with 3600 MW Interchange to FRCC
4 – Vogtle 2 unit out – Summer Peak with 3600 MW Interchange to FRCC
5 – Hatch 2 unit out – Summer Peak with 3600 MW Interchange to FRCC
6 – Gaston 5 unit out – Summer Peak with 3600 MW Interchange to FRCC

Interface Transfer Capability Impacts

Import and export capability studies were used to evaluate the effect of the requested transfer on interface transfer capability along the Southern Balancing Authority's interfaces.

- The requested transfer does not negatively impact the ability to meet existing firm obligations on the Entergy, Duke Power, South Carolina Gas and Electric, or Santee Cooper interfaces.

- The requested transfer negatively impacts the ability to meet existing firm obligations on the Tennessee Valley Authority and Santee Cooper interfaces. Southern Companies would not be able to accommodate this requested transfer and meet existing firm obligations on the Tennessee Valley Authority and Santee Cooper interfaces without projects listed in Table 3 to alleviate the constraints identified in Table 2 below.

Table 2. Impacts to Interface Transfer Capability – Southern Balancing Authority

Interface	Limiting Facility	Contingency	Scenario	Project
TVA Import	North Tifton 500 / 230 kV	Raccoon Creek 500 / 230 kV	1	I1

Interface	Limiting Facility	Contingency	Scenario	Project
SCPSA Import	Rayonier – North Jesup 115 kV	Thalmann – McCall Road 500 kV	2	OG
TVA Export	Ragsdale Road – Woodstock 230 kV	Bull Sluice – Big Shanty 500 kV	3	I2

Scenario Explanations:
1 – Smith 3 unit out – Summer Peak with 3600 MW Interchange to FRCC
2 – Hatch 1 unit out – Summer Peak with 3600 MW Interchange to FRCC
3 – Barry 5 unit out – Summer Peak with 2250 MW Interchange to FRCC

Stability Impacts

Although this request was limited to identifying constraints within the Southern Balancing Area, it should be noted that previous analyses have identified reactive power limitations within PF as a result of increased power flows (above the existing firm amount of 3600 MW) from the Southern Balancing Authority to PF. However, these analyses have identified that the system enhancements proposed by the utilities within PF should be adequate to support an increase in the transfer capability by the requested 650 MW. No other stability related constraints were identified within the Southern Balancing Authority Area.

Table 3. Potential Solutions for Identified Constraints – *Southern Balancing Authority*
The following projects are potential solutions to address the identified constraints and are based on the assumptions used in this 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 current projected enhancements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission system expansion plans could also impact the results of this study. These potential solutions only address constraints identified within the Southern Balancing Area that are associated with the proposed transfer. Other Balancing Areas were not monitored which could result in additional limitations and required system improvements.

Item	Potential Solution	Estimated Need Date	Estimated Cost
P1	**North Americus – North Tifton 115 kV Transmission Line** • Upgrade approximately 6.58 miles of 336 ACSR @ 50° C to 100°C operation between Ashburn Junction and Do les Junction	2014	$1,350,000
P2	**Douglas – Kettle Creek Primary 115 kV Transmission Line** • Upgrade approximately 4.3 miles of 336 ACSR @ 75° C to 100°C operation between Douglas and Oak Park	2014	$900,000
P3	**Thalmann – Duval 500 kV Transmission Line** • This line is a tie line between the Southern Balancing Authority and PF. The limiting element for this facility is within Peninsular Florida.	2014	N/A
P4	**Lloyd Shoals – South Griffin 115 kV Transmission Line** • Advance the reconductor of approximately 13.14 miles of 3/0 copper @ 75°C with 795 ACSR @100°C between South Griffin and Georgia Board of Corrections from 2015	2014	$500,000
P5	**Barneyville – Pine Grove Primary 115 kV Transmission Line** • Advance the reconductor of approximately 3.8 miles of 336 ACSR @ 100°C with 795 ACSR @ 100°C between Adel #1 Junction and South Adel Junction • Replace one (1) 600 amp line switch at Adel #1 Junction	2014	$250,000
P6	**Mitchell – Moultrie 115 kV Transmission Line** • Reconductor approximately 8 miles of 336 ACSR @ 100° C with 795 ACSR @ 100°C between Mitchell and Leste r • Replace two (2) 600 amp line switches at Mitchell and one (1) 600 amp line switch at Lester	2014	$3,000,000

Item	Potential Solution	Estimated Need Date	Estimated Cost
P7	**Jasper – Pine Grove Primary 115 kV Transmission Line** • Reconductor approximately 30 miles of 2/0 copper @ 50° C with 795 ACSR @ 100°C from Pinegrove to Jasper	2014	$11,000,000
I1	**North Tifton 500 / 230 kV Substation** • Replace existing North Tifton 500 / 230 kV transformer with a 2016 MVA transformer	2014	$36,000,000
I2	**Woodstock 230 kV Substation** • Replace existing 1200 amp line trap at Woodstock 230 kV substation with a 2000 amp line trap.	2014	$100,000
TOTAL (2014$)			**$53,100,000**

South Carolina Electric and Gas ("SCE&G") to Georgia

1000 MW

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Study Structure and Assumptions

Transfer Sensitivity	Transfer Amount	Transfer Source	Transfer Sink	Study Year
SCE&G to GA	1000 MW	SCE&G Load	Georgia Load	2014
Load Flow Cases				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				
Source Modeled				
An explicit source was not utilized for this requested transfer; therefore, a uniform load scale of the entire SCE&G Balancing Authority was utilized as the source for this requested transfer.				

Transmission System Impacts

Table 4 below identifies thermal constraints associated with the requested transfer of power for selected generation-out conditions. Other unit out conditions may also result in constraints to these or other facilities. The loadings listed in Table 4 represent the worst identified contingency and scenario for each limiting facility for the conditions studied. Other contingency and scenario conditions may also result in loadings greater than 100%.

Table 4. Transmission System Impacts – *Southern Balancing Authority*

Limiting Element	Rating (MVA)	Thermal Loadings % Without Request	Thermal Loadings % With Request	Contingency	Scenario	Project
The following constraints have been identified as directly attributable to the above defined transfer						
471 NLAVONIA 115 2003 AIRLINE2 115 1	216	93.4	103.1	94 BIO 230 105 VANNA 230 1	2	P1
92 GAINSVL#2-2 230 2002 GVIL#2-2 115 1	298	97.4	100.1	89 GAINSVL#2-1 230 420 GVIL#2-1 115 1	5	P2
The following facilities could become potential constraints in future years or with different queueing assumptions						
1379 GUMLOG J 115 2406 TNS JN 115 1	188	91.4	99.5	94 BIO 230 105 VANNA 230 1	3	--
472 AIRLINE1 115 473 BIO 115 1	255	89.0	98.2	94 BIO 230 105 VANNA 230 1	2	--
491 E ATHENS 115 492 EWATKNSV 115 1	124	82.9	95.0	122 E WATKNSV 2 230 1785 BARNETT SHL 230 1	4	--
469 AVALON 115 1379 GUMLOG J 115 1	188	85.4	93.5	94 BIO 230 105 VANNA 230 1	3	--
471 NLAVONIA 115 2405 TNS JS 115 1	216	86.3	93.3	94 BIO 230 105 VANNA 230 1	3	--
102 E WATKNSV 1 230 492 EWATKNSV 115 1	332	81.4	90.9	102 E WATKNSV 1 230 122 E WATKNSV 2 230 1	1	--

Unit Out Scenario Explanations:

1 – Athens CT units out – Summer Peak with 2250 MW Interchange to FRCC

4 – Bowen Unit 4 out – Summer Peak with 3600 MW Interchange to FRCC

2 – Bowen Unit 4 out – Summer Peak with 2250 MW Interchange to FRCC
3 – Athens CT units out – Summer Peak with 3600 MW Interchange to FRCC
5 – Gaston Unit 5 out – Summer Peak with 3600 MW Interchange to FRCC

Interface Transfer Capability Impacts

Import and export capability studies were used to evaluate the effect of the requested transfer on interface transfer capability along the Southern Balancing Authority's interfaces.

- The requested transfer does not negatively impact the ability to meet existing firm obligations on the Entergy interface.
- The requested transfer negatively impacts the ability to meet existing firm obligations on the Duke Power, South Carolina Gas and Electric, Santee Cooper, and Tennessee Valley Authority interfaces. Southern Companies would not be able to accommodate this requested transfer and meet existing firm obligations on the above referenced interfaces without projects listed in Table 6 to alleviate the constraints identified in Table 5 below.

Table 5. Impacts to Interface Transfer Capability

Interface	Limiting Facility	Contingency	Scenario	Project
Duke Import	North Lavonia – TNS Junction 115 kV	Bio – Vanna 230 kV	1	I1
	Gumlog Junction – Avalon 115 kV	Bio – Vanna 230 kV	1	I1
	TNS Junction – Gumlog Junction 115 kV	Vanna Reactor – Vanna 230 kV	1	I1
	Bio – Airline 115 kV	Vanna Reactor – Vanna 230 kV	1	I1
	Russell – Lexington 230 kV	South Hall – Oconee 500 kV	2	I1
	East Watkinsville 230 / 115 kV	East Watkinsville Bus Tie 230 kV	2	I1
	Norcross 500 / 230 kV	Norcross 500 / 230 kV	2	I1
	Athena – Center 230 kV	South Hall – Oconee 500 kV	4	I2

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Interface	Limiting Facility	Contingency	Scenario	Project
SCEG Import	Rayonier – North Jesup 115 kV	Thalmann – McCall Road 500 kV	3	OG
SCPSA Import	Rayonier – North Jesup 115 kV	Thalmann – McCall Road 500 kV	3	OG
TVA Import	Russell – Lexington 230 kV	South Hall – Oconee 500 kV	2	I1
	Athena – Center 230 kV	South Hall – Oconee 500 kV	4	I2

Unit Out Scenario Explanations:

1 – Bowen Unit 1 out – Summer Peak with 2250 MW Interchange to FRCC
2 – McDonough 5 unit out – Summer Peak with 2250 MW Interchange to FRCC
3 – Hatch Unit 1 out – Summer Peak with 3600 MW Interchange to FRCC
4 – Bowen Unit 4 out – Summer Peak with 2250 MW Interchange to FRCC

Stability Impacts

None identified.

Table 6. Potential Solutions for Identified Constraints – *Southern Balancing Authority*

The following projects are potential solutions to address the identified constraints and are based on the assumptions used in this 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 current projected enhancements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission system expansion plans could also impact the results of this study. These potential solutions only address constraints identified within the Southern Balancing Area that are associated with the proposed transfer. Other Balancing Areas were not monitored which could result in additional limitations and required system improvements.

Item	Potential Solution	Estimated Need Date	Estimated Cost
P1	**Avalon Junction – Bio 115 kV Transmission Line** • Upgrade approximately 8.5 miles of 795 ACSR @ 100° C to 125°C operation between Airline #2 to North Lav onia	2014	$3,800,000
P2	**Gainesville # 2 115 kV Substation** • Replace Low-side 1590 AAC Jumpers with 2000 AAC Jumpers • Upgrade the 115 kV #2 main bus from 1590 AAC with bundled (2-1590 AAC) conductors	2014	$200,000
I1	**Athena – Hartwell 230 kV Transmission Line** Construct approximately 40 miles of new 230 kV transmission line with 2 – 1351 ACSR @ 100 C from Athena to Hartwell Energy.	2014	$44,000,000
I2	**Center Primary 230 kV Substation** • Bundle 1590 AAC Transfer Bus **Athena 230 kV Substation** • Upgrade the main bus from 1590 AAC with bundled • (2 – 1590 AAC) conductors • Upgrade the transfer bus from 1590 AAC with bundled • (2 – 1590 AAC) conductors • Upgrade the jumpers from 1590 AAC with bundled • (2 – 1590 AAC) conductors	2014	$300,000
TOTAL (2014$)			**$48,300,000**

Gulfport, MS to Georgia

1000 MW

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Study Structure and Assumptions

Transfer Sensitivity	Transfer Amount	Transfer Source	Transfer Sink	Study Year
Gulfport, MS to GA	1000 MW	Daniel 500-kV	Georgia Load	2014
Load Flow Cases				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				
Source Modeled				
The source utilized for this transfer was assumed to be a new 1000 MW generator interconnected along the Daniel – McKnight 500 kV transmission line in the Gulfport Mississippi area.				

Transmission System Impacts

Table 7 below identifies thermal constraints associated with the requested transfer of power for selected generation-out conditions. Other unit out conditions may also result in constraints to these or other facilities. The loadings listed in Table 7 represent the worst identified contingency and scenario for each limiting facility for the conditions studied. Other contingency and scenario conditions may also result in loadings greater than 100%. Additionally, the transmission system impacts contained in Table 7 result from the above defined transfer and includes the enhancements to address the stability limitations detailed in the stability section below.

Table 7. Transmission System Impacts – *Southern Balancing Authority*

		Thermal Loadings %				
Limiting Element	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
The following constraints have been identified as directly attributable to the above defined transfer						
4511 SNOWDN6 230 5138 PIKE CO6 230 1	478	93.0	110.8	4512 SNOWDN8 500 4600 FARLEY 8 500 1	2	P5
4534 AUM MONT 115 5515 AUM TAP2 115 1	216	93.1	107.2	2500 RACCOON CK 500 3021 LONGLEAF 500 1	8	P12
8702 DANIEL 230 8705 MSPT EFR 230 1	828	68.8	107.1	8702 DANIEL 230 8815 WADE SS 230 1	1	P2
8705 MSPT EFR 230 8710 MOSSPT E 230 1	828	65.6	103.9	8702 DANIEL 230 8815 WADE SS 230 1	1	P2
4548 ECI HALS 115 4549 MERRY TP 115 1	138	88.8	103.4	4512 SNOWDN8 500 4600 FARLEY 8 500 1	2	P4
4418 MART DAM 115 4421 DADVL #2 115 1	71	89.3	103.4	4304 ANISTON3 115 4396 GOLD SPR 115 1	6	P10
218 S BAINBRDGE 230 4601 FARLEY 6 230 1	693	92.0	103.3	2500 RACCOON CK 500 3021 LONGLEAF 500 1	2	P6
615 VICTORY3 115 1500 CHLORIDE 115 1	124	98.9	103.1	612 FIRST AVE 115 1561 RVRFRTJC 115 1	9	P8
603 WPOINT#2 115 605 PITMNRD3 115 1	188	98.1	102.8	125 FORTSON 230 1579 MULBERRY GR 230 1	7	OG
4700 BARRY 6 230 7057 SPAN MIL 230 1	602	95.2	102.7	4638 CHICK 6 230 4700 BARRY 6 230 1	3	P3

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5219 BYNUM3 115 5223 PPLSILTP 115 1	454	97.4	102.3	4305 ANISTON6 230 5220 BYNUM6 230 1	5	P7
7057 SPAN MIL 230 7060 CRIST 230 1	602	94.3	101.9	4638 CHICK 6 230 4700 BARRY 6 230 1	3	P3
5153 FLATBRTP 115 5223 PPLSILTP 115 1	454	97.0	101.9	4305 ANISTON6 230 5220 BYNUM6 230 1	5	P7
4403 CROOK CK 115 4421 DADVL #2 115 1	72	87.7	101.7	4304 ANISTON3 115 4396 GOLD SPR 115 1	6	P9
655 STMARDJ3 115 1500 CHLORIDE 115 1	124	96.8	101.0	614 BROOKHV3 115 1561 RVRFRTJC 115 1	9	P11
4458 HUGULEY 115 4985 NORBORD 115 1	212	96.9	100.6	607 BARTLFY3 115 4665 BKWTRTAP 115 1	4	OG
208 NELSON 230 954 NELSON 115 1	180	99.2	100.6	208 NELSON 230 954 NELSON 115 2	4	OG
5214 ELMORETP 115 17280 SPGNTAP 115 1	216	86.2	100.1	4529 FORBESRD 115 5067 WET DSTP 115 1	6	OG
4655 N MOBILE 115 5270 CHUNTAP2 115 1	112	88.6	100.1	4700 BARRY 6 230 5148 IPSCO 230 1	10	OG
4303 COLDWATR 115 5153 FLATBRTP 115 1	454	95.1	100.0	4305 ANISTON6 230 5220 BYNUM6 230 1	5	P7
The following facilities could become potential constraints in future years or with different queueing assumptions						
4801 WDCRSTTP 115 4846 WELLRDTP 115 1	138	92.7	99.9	4511 SNOWDN6 230 4558 GREENVL6 230 1	16	--
4399 DELTA 115 5199 FRIENDSH 115 1	113	92.5	99.1	4305 ANISTON6 230 5297 GOSHENTP 230 1	6	--
4200 BESSEMER 115 4202 BESSGRCO 230 1	392	90.8	98.8	4374 S.BESS 6 230 5036 S BESS 3 115 1	19	--
4700 BARRY 6 230 5148 IPSCO 230 1	693	79.6	98.5	4638 CHICK 6 230 4700 BARRY 6 230 1	3	--
4510 W MONTG3 115 4846 WELLRDTP 115 1	135	91.8	98.0	4511 SNOWDN6 230 4558 GREENVL6 230 1	18	--
4554 LAMAR RD 115 4801 WDCRSTTP 115 1	138	90.0	97.8	4511 SNOWDN6 230 4558 GREENVL6 230 1	1	--
4213 HOLT 3 115 4346 COTNDALE 115 1	212	91.6	96.7	4348 S.TUSC 3 115 4349 KAULGMTP 115 1	17	--
125 FORTSON 230 130 GOAT ROCK 230 1	1192	89.8	96.6	130 GOAT ROCK 230 1530 CAMP MCKENZ 230 1	11	--
4701 BARRY 3 115 5270 CHUNTAP2 115 1	112	88.5	96.6	4638 CHICK 6 230 4700 BARRY 6 230 1	16	--
4534 AUM MONT 115 4606 MCLEMORE 115 1	216	82.4	96.4	2500 RACCOON CK 500 3021 LONGLEAF 500 1	8	--
4399 DELTA 115 4401 LINEVILL 115 1	113	89.1	95.6	4305 ANISTON6 230 5297 GOSHENTP 230 1	6	--
4418 MART DAM 115 5149 TURNERRD 115 1	112	86.2	95.1	4304 ANISTON3 115 4396 GOLD SPR 115 1	6	--
848 PINEGROV 115 1464 HAZLETAP 115 1	114	84.3	94.6	160 HATCH 230 2102 HATCH SS 2 230 1	15	--
4518 ELMORE 115 17280 SPGNTAP 115 1	213	80.3	94.5	4529 FORBESRD 115 5067 WET DSTP 115 1	6	--
681 MITCHELL 115 682 LESTER 115 1	124	83.5	94.3	24 N TIFTON 500 2500 RACCOON CK 500 1	14	--
4424 WALSBORO 115 4425 JORDN DM 115 1	140	74.8	94.3	4534 AUM MONT 115 5515 AUM TAP2 115 1	6	--
4403 CROOK CK 115 5200 SWAGG 115 1	140	85.9	94.0	184 BREMEN 230 969 BREMEN 115 1	4	--
5898 CO LINE3 115 17279 MILBRK 115 1	269	82.4	93.6	4529 FORBESRD 115 5067 WET DSTP 115 1	6	--
4425 JORDN DM 115 4954 RUSEL TP 115 1	138	73.2	93.0	4534 AUM MONT 115 5515 AUM TAP2 115 1	6	--
4404 MORR XRD 115 5200 SWAGG 115 1	140	84.4	92.4	184 BREMEN 230 969 BREMEN 115 1	4	--
4430 BOULDDAM 115 4518 ELMORE 115 1	212	78.2	92.4	4529 FORBESRD 115 5067 WET DSTP 115 1	6	--
4535 MTMEIGTP 115 4606 MCLEMORE 115 1	216	77.6	91.6	2500 RACCOON CK 500 3021 LONGLEAF 500 1	8	--
4423 HALLCHAP 115 4424 WALSBORO 115 1	140	71.9	91.4	4534 AUM MONT 115 5515 AUM TAP2 115 1	6	--
4419 RED RDGE 115 5149 TURNERRD 115 1	112	82.2	91.2	4304 ANISTON3 115 4396 GOLD SPR 115 1	6	--
130 GOAT ROCK 230 1530 CAMP MCKENZ 230 1	1204	84.7	91.1	125 FORTSON 230 130 GOAT ROCK 230 1	11	--
4593 HEADLAND 115 4594 WEBB 3 115 1	107	79.0	90.8	2500 RACCOON CK 500 3021 LONGLEAF 500 1	8	--
2500 RACCOON CK 500 2510 RACCOON CK 230 1	1350	78.5	90.8	24 N TIFTON 500 2500 RACCOON CK 500 1	13	--
8725 BAYOU CA 115 8728 DESTINPL 115 1	107	73.1	90.6	8711 MOSSPT E 115 8713 MSPT E T 115 1	12	--

125 FORTSON 230 1530 CAMP MCKENZ 230 1	1192	83.9	90.4	125 FORTSON 230 130 GOAT ROCK 230 1	11	--
4552 UNION SP 115 5139 PIKE CO3 115 1	138	78.0	90.3	4514 S MONTG3 115 4547 PINEDALE 115 1	6	--

Unit Out Scenario Explanations:

1 - Barry Unit 5 – Summer Peak with 3600 MW interchange to FRCC
2 - Smith Unit 3 – Summer Peak with 3600 MW interchange to FRCC
3 - Crist Unit 7 – Summer Peak with 3600 MW interchange to FRCC
4 - Athens CT – Summer Peak with 2250 MW interchange to FRCC
5 - Bowen Unit 1 – Shoulder
6 - McDonough Unit 5 – Shoulder
7 - Yates Unit 7 – Summer Peak with 2250 MW interchange to FRCC
8 - Scherer Unit 4 – Shoulder
9 - Wansley Unit 1 – Summer Peak with 2250 MW interchange to FRCC
10- Daniel CC1 – Shoulder
11- Wansley Unit 1 – Summer Peak with 3600 MW interchange to FRCC
12 – Kemper IGCC – Summer Peak with 2250 MW interchange to FRCC
13 - Hatch Unit 2 – Summer Peak with 3600 MW interchange to FRCC
14 - Hatch Unit 1 – Summer Peak with 3600 MW interchange to FRCC
15 - Vogtle Unit 1 – Summer Peak with 2250 MW interchange to FRCC
16- Barry Unit 5 – Summer Peak with 2250 MW interchange to FRCC
17 - Gorgas Unit 10 – Shoulder
18 – Daniel CC – Summer Peak with 2250 MW interchange to FRCC
19 - Gaston Unit 5 – Shoulder

Interface Transfer Capability Impacts

Import and export capability studies were used to evaluate the effect of the requested transfer on interface transfer capability along the Southern Balancing Authority's interfaces.

- The requested transfer does not negatively impact the ability to meet existing firm obligations on the South Carolina Gas and Electric or the Santee Cooper interfaces.

- The requested transfer negatively impacts the ability to meet existing firm obligations on the Duke Power, Entergy, and Tennessee Valley Authority interfaces. Southern Companies would not be able to accommodate this requested transfer and meet existing firm obligations on the above referenced interfaces without projects listed in Table 9 to alleviate the constraints identified in Table 8 below.

Table 8. Impacts to Interface Transfer Capability

Interface	Limiting Facility	Contingency	Scenario	Project
Duke Import	North Lavonia – TNS Junction 115 kV	Bio – Vanna 230 kV	1	OG
	Airline – North Lavonia 115 kV	Bio – Vanna 230 kV	1	OG

Interface	Limiting Facility	Contingency	Scenario	Project
Duke Import	Bio – Airline 115 kV	Bio – Vanna 230 kV	1	OG
	TNS Junction – Gumlog Junction 115 kV	Bio – Vanna 230 kV	1	OG
TVA Import	Bennett – North Theodore 230 kV	Daniel – Wade SS 230 kV	2	I1
DUKE Export	Goat Rock – Fortson 230 kV	Goat Rock – Camp McKenzie 230 kV	3	I2
TVA Export	Gulf States Steel – Attalla 115 kV	Gadsden – Lookout Mountain 115 kV	4	OG
EES Import	Bennett – North Theodore 230 kV	Daniel – Wade 230 kV	2	I1
	Goat Rock – Fortson 230 kV	Fortson – Camp McKenzie 230 kV	5	I2

Scenario Explanations:
1 – No unit out – Summer Peak with 2250 MW interchange to FRCC
2 – Barry 5 unit out – Summer Peak with 3600 MW interchange to FRCC
3 – Athens CTs unit out – Summer Peak with 3600 MW interchange to FRCC
4 – Vogtle 1 unit out – Summer Peak with 2250 MW interchange to FRCC
5 – Athens CTs unit out – Summer Peak with 2250 MW interchange to FRCC

Stability Impacts

1000 MW transfer from Gulfport, MS to the Georgia ITS, 1000 MW of generation was added at Daniel 500 kV substation near Gulfport. The generation was assumed to be combined cycle generation with typical dynamic characteristics. No other new generation was assumed in the area. Generation in Georgia was reduced accordingly to create the transfer.

With the addition of this generation at Daniel, a fault at Daniel on the Daniel – McKnight 500 kV transmission line resulted in all of the units in the area pulling out of synchronism with the rest of the Eastern Interconnection. The resulting impedance swings extended far into the system away from the units. Transmission line relaying would interpret the impedance swings as a fault and would open the transmission lines. This would cause the area to separate from the rest of the Eastern Interconnection. With this additional 1000 MW of generation, a 500 kV line originating from Daniel is needed to address the stability constraint and to transport the power to the Georgia ITS. Details of the projects required to construct this line can be found in project P1 listed in Table 9.

Additionally, a fault at Farley on the Raccoon Creek 500 kV line creates unacceptable voltage security margins in the southwest Georgia area. In order to maintain a 5% Voltage Security Margin, the Donalsonville – West Donalsonville 115 kV line must be networked (project P13 listed in Table 9) and a 150 MVAR Static VAR Compensator ("SVC") placed at South Bainbridge 230 kV substation (project P12 listed in Table 9).

Table 9. Potential Solutions for Identified Constraints – *Southern Balancing Authority*

The following projects are potential solutions to address the identified constraints and are based on the assumptions used in this 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 current projected enhancements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission system expansion plans could also impact the results of this study. These potential solutions only address constraints identified within the Southern Balancing Area that are associated with the proposed transfer. Other Balancing Areas were not monitored which could result in additional limitations and required system improvements.

Item	Potential Solution	Estimated Need Date	Estimated Cost
P1	**Daniel – Snowdoun 500 kV Transmission Line** • Construct approximately 90 miles of new 500 kV transmission line with 3 – 1033 ACSR @ 100°C from North Brewton to Snowdoun • Convert approximately 60.6 miles of 230 kV transmission line to 500 kV operation between Ellicott and North Brewton • Rebuild approximately 30.4 miles of the existing Big Creek – Ellicott 230 kV transmission line with 3 – 1033 ACSR @ 100°C and convert to 500 kV operation • Convert approximately 22.1 miles of 230 kV transmission line to 500 kV operation between Daniel and Big Creek • Rebuild approximately 18.5 miles between the existing Wade – Big Creek 115 kV transmission with 2 – 1351 ACSS @ 160°C and convert to 230 kV operation • Reconductor approximately 8.9 miles of the existing Daniel – Wade 230 kV transmission line (1351 ACSR @ 100°C) with 2 – 1351 ACSS @ 160°C	2014	$340,000,000
P2	**Daniel – Bennett 230 kV Transmission Line** • Construct approximately 11 miles of new 230 kV transmission line with 1351 ACSR @ 100°C from Dani el to a new 230 / 115 kV substation along the existing Moss Point East – Theodore 230 kV transmission line	2014	$23,000,000
P3	**Barry – Crist 230 kV Transmission Line** • Advance the upgrade of approximately 61.5 miles of 1351 ACSR @ 100°C to 125°C operation from 2016	2014	$2,200,000

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Item	Potential Solution	Estimated Need Date	Estimated Cost
P4	**South Montgomery – Union Spring 115 kV Transmission Line** • Reconductor approximately 4.9 miles of 397 ACSR @ 100°C with 795 ACSR @ 100°C between ECI Halstead Tap and Merry Tap	2014	$3,500,000
P5	**Pike County – Snowdoun 230 kV Transmission Line** • Upgrade approximately 32.3 miles of 1033 ACSR @ 93° C to 125°C operation	2014	$18,300,000
P6	**Farley – South Bainbridge 230 kV Transmission Line** • Install a 1% line reactor at South Bainbridge Substation in the South Bainbridge – Farley 230 kV Transmission line	2014	$2,500,000
P7	**Anniston – Bynum 230 kV Transmission Line** • Construct approximately 10 miles of new 230 kV transmission line from the existing Bynum 230 kV substation to the existing Anniston 230 kV substation with 1351 ACSR @ 100°C	2014	$10,000,000
P8	**Bull Creek – Victory Drive 115 kV Transmission Line** • Reconductor approximately 2.5 miles of 336 ACSR @ 100 C with 795 ACSR @ 100 C between Victory Drive and Saint Marys Road Tap	2014	$2,500,000
P9	**Crooked Creek – Martin Dam 115 kV Transmission Line** • Upgrade approximately 46.5 miles of 397 ACSR @ 50° C to 100°C operation	2014	$8,500,000
P11	**Madison Park – Thurlow Dam 115 kV Transmission Line** • Reconductor approximately 2 miles of 795 ACSR @ 100° C with 795 ACSS @ 160°C between Auburn University at Montgomery #2 and Auburn University of Montgomery Tap	2014	$750,000
P12	**South Bainbridge 230 kV Substation** • Install 1 – 150 MVAR SVCs at or electrically near the existing South Bainbridge 230 kV substation	2014	$20,000,000
P13	**Bainbridge Area 115 kV Network Enhancements** • Construct a new 115 kV switching station near the existing Donalsonville 115 kV substation and upgrade approximately 0.6 miles of 4/0 ACSR @ 50°C to 100° C	2014	$5,000,000
I1	**Bennett – North Theodore 230 kV Transmission Line** • Upgrade approximately 21.5 miles of 1351 ACSR @ 93.3°C to 100℃ operation	2014	$760,000

Item	Potential Solution	Estimated Need Date	Estimated Cost
I2	**Goat Rock – Fortson 230 kV Transmission Line** • Construct a third line of approximately 10 miles with 2 – 1351 ACSR @ 100℃	2014	$20,000,000
TOTAL (2014$)			**$457,010,000**

Washington Co. to Georgia

5000 MW

Study Structure and Assumptions

Transfer Sensitivity	Transfer Amount	Transfer Source	Transfer Sink	Study Year
Washington Co. to GA	5000 MW	Washington Co., GA	Georgia Load	2014
Load Flow Cases				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				
Source Modeled				
The source for this transfer was assumed to be four (4) 1250 MW different generators connected to the 500 kV System in the Washington County Georgia Area. One (1) of the generators interconnected along the Scherer – Warthen 500 kV Transmission Line. The second generator was interconnected along the Warthen – Thomson 500 kV Transmission Line. The last two generators were connected along the Warthen – Vogtle 500 kV Transmission Line at two separate locations.				

Transmission System Impacts

Table 10 below identifies thermal constraints associated with the requested transfer of power for selected generation-out conditions. Other unit out conditions may also result in constraints to these or other facilities. The loadings listed in Table 10 represent the worst identified contingency and scenario for each limiting facility for the conditions studied. Other contingency and scenario conditions may also result in loadings greater than 100%.

Table 10. Transmission System Impacts – *Southern Balancing Authority*

Limiting Element	Rating (MVA)	Thermal Loadings %		Contingency	Scenario	Project
		Without Request	With Request			
The following constraints have been identified as directly attributable to the above defined transfer						
107 WARRENTON 230 1413 THOMSON 230 1	539	13.8	164.4	18 SCHERER 500 9901 ECO1 500 1	20	P3
1413 THOMSON 230 1490 THOMSON 500 1	1344	51.6	161.4	8 VOGTLE 500 9904 ECO4 500 1	12	P4
525 DUM JON 115 534 WESTAUG 115 1	249	48.8	153.2	8 VOGTLE 500 9904 ECO4 500 1	12	P4
107 WARRENTON 230 147 BRANCH 230 1	497	10.6	151.7	18 SCHERER 500 9901 ECO1 500 1	20	P3
489 UNION PT 115 2440 MAXEYS 115 1	124	85.4	150.2	489 UNION PT 115 1374 GREENBRO 115 1	17	P2
2022 WOLFSKIN 115 2440 MAXEYS 115 1	124	82.1	146.7	489 UNION PT 115 1374 GREENBRO 115 1	17	P2
2019 CHEROKRD 115 2022 WOLFSKIN 115 1	124	80.1	144.5	489 UNION PT 115 1374 GREENBRO 115 1	17	P2
520 EVANS 115 1455 FURYSTAP 115 1	135	65.4	142.8	8 VOGTLE 500 9904 ECO4 500 1	12	P4

117 WAYNESBORO 230 118 WADLEY PRI 230 1	556	30.6	140.0	18 SCHERER 500 9901 ECO1 500 1	19	P3
514 WARRENTON 115 515 THOMSON 115 1	124	26.8	139.8	107 WARRENTON 230 1413 THOMSON 230 1	3	P3
488 ATHENA 115 2019 CHEROKRD 115 1	124	36.7	137.2	18 SCHERER 500 9901 ECO1 500 1	20	P3
110 EVANS 230 1413 THOMSON 230 1	497	59.4	135.8	8 VOGTLE 500 9904 ECO4 500 1	12	P2
115 VOGTLE 230 116 WILSON 230 1	718	63.8	133.9	8 VOGTLE 500 9 W MCINTOSH 500 1	11	P5
116 WILSON 230 117 WAYNESBORO 230 1	718	63.8	133.9	8 VOGTLE 500 9 W MCINTOSH 500 1	11	P5
530 STEVNSCK 115 1455 FURYSTAP 115 1	124	46.7	132.7	8 VOGTLE 500 9904 ECO4 500 1	12	P2
571 SYLVANIA 115 581 KINGMFG3 115 1	63	62.4	127.7	8 VOGTLE 500 9 W MCINTOSH 500 1	11	P4
513 WASHINGJ 115 514 WARRENTON 115 1	301	52.7	126.7	18 SCHERER 500 9901 ECO1 500 1	20	P2
8 VOGTLE 500 9904 ECO4 500 1	2701	7.5	124.8	18 SCHERER 500 9901 ECO1 500 1	13	P3
8 VOGTLE 500 115 VOGTLE 230 2	1344	77.0	124.5	8 VOGTLE 500 115 VOGTLE 230 1	23	P6
18 SCHERER 500 9901 ECO1 500 1	2701	5.4	123.6	8 VOGTLE 500 9904 ECO4 500 1	21	P1
515 THOMSON 115 1413 THOMSON 230 1	300	61.0	123.4	107 WARRENTON 230 1413 THOMSON 230 1	18	P3
489 UNION PT 115 513 WASHINGJ 115 1	301	49.9	123.2	18 SCHERER 500 9901 ECO1 500 1	11	P3
581 KINGMFG3 115 1483 DOVER TP 115 1	63	56.3	123.2	8 VOGTLE 500 9 W MCINTOSH 500 1	20	P4
1378 BOGGS RD 230 2031 PURCELL RD 230 1	509	94.0	121.4	11 S HALL 500 2035 S HALL 230 1	8	P1
8 VOGTLE 500 9904 ECO4 500 1	2701	7.5	121.1	18 SCHERER 500 9901 ECO1 500 1	13	P1
1099 N JESUP 115 1100 RAYONIER 115 1	124	89.6	120.6	15 THALMANN 500 2158 MCCALL RD 500 1	11	OG
530 STEVNSCK 115 538 15TH ST 115 1	124	32.9	119.3	8 VOGTLE 500 9904 ECO4 500 1	12	P1
100 E SOCIALCIR 230 2326 R_EATSW E-E 230 1	602	82.5	118.1	147 BRANCH 230 1689 FOREST LAKE 230 1	10	P2
401 DULUTH 115 1306 SUGRLFTP 115 1	181	96.6	116.7	11 S HALL 500 2035 S HALL 230 1	23	P1
115 VOGTLE 230 370015 6SRS 230 1	1020	57.8	115.9	8 VOGTLE 500 9 W MCINTOSH 500 1	9	P2
153 ROBINS SP 115 828 DEEPSTEP 115 1	63	44.7	115.5	18 SCHERER 500 9901 ECO1 500 1	20	P4
1 KLONDIKE 500 18 SCHERER 500 1	3429	68.5	114.8	16 OHARA 500 18 SCHERER 500 1	24	P1
111 DUM JON 230 112 BARTON CHPL 230 1	497	21.6	114.6	8 VOGTLE 500 9904 ECO4 500 1	12	P1
147 BRANCH 230 152 EATONTON SW 230 1	602	81.0	114.4	147 BRANCH 230 1689 FOREST LAKE 230 1	22	P2
147 BRANCH 230 1689 FOREST LAKE 230 1	596	83.8	114.3	100 E SOCIALCIR 230 2326 R_EATSW E-E 230 1	17	P1
117 WAYNESBORO 230 562 WAYNESBORO 115 1	280	74.0	114.0	117 WAYNESBORO 230 118 WADLEY PRI 230 1	5	P7
580 CLITO 115 1483 DOVER TP 115 1	63	44.3	113.5	8 VOGTLE 500 9 W MCINTOSH 500 1	11	P1
269 JACKSON LK 230 365 PORTERDALE 230 1	497	62.4	113.1	18 SCHERER 500 9901 ECO1 500 1	20	P3
515 THOMSON 115 517 KIOKEE J 115 1	124	62.3	112.4	8 VOGTLE 500 9904 ECO4 500 1	23	P1
159 EATONTON AB 230 1689 FOREST LAKE 230 1	596	81.6	112.2	100 E SOCIALCIR 230 2326 R_EATSW E-E 230 1	6	P1
1424 W MCINTOSH2 230 9001 MCINTOSH 230 1	1614	75.8	112.2	1421 W MCINTOSH1 230 9001 MCINTOSH 230 1	17	OG
1421 W MCINTOSH1 230 9001 MCINTOSH 230 1	1614	82.4	112.0	1424 W MCINTOSH2 230 9001 MCINTOSH 230 1	4	OG
1413 THOMSON 230 2164 HARLEM 230 1	602	46.6	112.0	8 VOGTLE 500 9904 ECO4 500 1	12	P1
560 LVLLEJCT 115 562 WAYNESBORO 115 1	124	35.1	111.9	117 WAYNESBORO 230 118 WADLEY PRI 230 1	3	P1
8 VOGTLE 500 9 W MCINTOSH 500 1	2439	30.6	111.9	8 SCHERER 500 9901 ECO1 500 1	29	P2
147 BRANCH 230 2054 EATONTON C 230 1	596	68.3	111.2	18 SCHERER 500 9901 ECO1 500 1	20	P2
2164 HARLEM 230 2165 BERZELIA 230 1	602	45.3	110.6	8 VOGTLE 500 9904 ECO4 500 1	12	P1

18 SCHERER 500 9901 ECO1 500 1	2701	10.6	110.5	8 VOGTLE 500 9 W MCINTOSH 500 1	21	P1
90 LAWRENCEVL 230 2031 PURCELL RD 230 1	509	86.2	110.4	11 S HALL 500 2035 S HALL 230 1	3	P1
16 OHARA 500 18 SCHERER 500 1	3429	64.6	109.7	1 KLONDIKE 500 18 SCHERER 500 1	17	P1
8 VOGTLE 500 115 VOGTLE 230 1	1527	67.7	109.5	8 VOGTLE 500 115 VOGTLE 230 2	23	P1
1331 SIGMAN RD 115 1914 CORNISH MTN 115 1	188	82.1	109.0	73 KLONDIKE 230 97 HONEY CRK 230 1	17	P1
111 DUM JON 230 2165 BERZELIA 230 1	602	43.4	108.6	8 VOGTLE 500 9904 ECO4 500 1	12	P1
588 LUDOWICI 115 1417 HORSECRK 115 1	155	84.3	108.3	15 THALMANN 500 2158 MCCALL RD 500 1	11	OG
1095 JESUP 115 1099 N JESUP 115 1	124	76.5	108.1	15 THALMANN 500 2158 MCCALL RD 500 1	11	OG
100 E SOCIALCIR 230 2370 R_ESC B-ESC 230 1	602	77.4	107.6	100 E SOCIALCIR 230 2326 R_EATSW E-E 230 1	17	P1
159 EATONTON AB 230 2370 R_ESC B-ESC 230 1	602	77.5	107.6	100 E SOCIALCIR 230 2326 R_EATSW E-E 230 1	17	P1
1 KLONDIKE 500 3 NORCROSS 500 1	2759	88.6	107.5	1 KLONDIKE 500 1919 R_KLONDIKE 230 1	17	P1
96 CONYERS 230 1314 STONECREST 230 1	596	78.6	107.3	1 KLONDIKE 500 3 NORCROSS 500 1	18	P1
152 EATONTON SW 230 2326 R_EATSW E-E 230 1	664	74.8	107.1	147 BRANCH 230 1689 FOREST LAKE 230 1	10	P1
8 VOGTLE 500 9 W MCINTOSH 500 1	2439	21.3	106.4	18 SCHERER 500 9901 ECO1 500 1	20	P1
111 DUM JON 230 525 DUM JON 115 1	280	59.7	105.1	8 VOGTLE 500 9904 ECO4 500 1	12	P1
73 KLONDIKE 230 97 HONEY CRK 230 1	662	78.3	104.4	1 KLONDIKE 500 3 NORCROSS 500 1	18	P1
1 KLONDIKE 500 1919 R_KLONDIKE 230 1	1644	86.4	104.1	1 KLONDIKE 500 3 NORCROSS 500 1	16	P1
828 DEEPSTEP 115 2312 STEMBRDG 115 1	63	31.1	103.8	18 SCHERER 500 9901 ECO1 500 1	20	P2
113 PEACH ORCHD 230 114 GOSHEN 230 1	497	76.3	103.7	1413 THOMSON 230 1490 THOMSON 500 1	18	P1
484 ATHENS 1 115 488 ATHENA 115 1	124	87.6	103.4	488 ATHENA 115 503 CERTANTD 115 1	4	P1
73 KLONDIKE 230 1919 R_KLONDIKE 230 1	1658	85.7	103.2	1 KLONDIKE 500 3 NORCROSS 500 1	16	P1
370015 6SRS 230 370406 6CANADYS 230 1	509.9	55.1	102.4	8 VOGTLE 500 9 W MCINTOSH 500 1	11	P1
73 KLONDIKE 230 74 MORROW 230 1	539	95.6	102.1	1 KLONDIKE 500 1919 R_KLONDIKE 230 1	3	P1
1 KLONDIKE 500 16 OHARA 500 1	2439	90.4	101.8	1 KLONDIKE 500 18 SCHERER 500 1	17	P1
96 CONYERS 230 106 ROCKDALE 230 1	433	99.8	101.5	1 KLONDIKE 500 3 NORCROSS 500 1	15	P1
490 UNIV GA 115 504 N ATHENS 115 1	188	94.0	101.0	102 E WATKNSV 1 230 492 EWATKNSV 115 1	7	P1
92 GAINSVL#2-2 230 2002 GVIL#2-2 115 1	298	96.2	100.9	89 GAINSVL#2-1 230 2035 S HALL 230 1	2	P2
335 DAWSON CROS 230 2032 DAWSON CROS 115 1	344	99.2	100.8	11 S HALL 500 2035 S HALL 230 1	1	P1
149 S MACON 230 767 S MACON 115 2	330	83.2	100.8	149 S MACON 230 767 S MACON 115 1	14	P2
97 HONEY CRK 230 1314 STONECREST 230 1	664	74.3	100.2	1 KLONDIKE 500 3 NORCROSS 500 1	18	P1
The following facilities could become potential constraints in future years or with different queueing assumptions						
1398 WILLARD 230 2054 EATONTON C 230 1	596	57.1	99.6	18 SCHERER 500 9901 ECO1 500 1	20	--
149 S MACON 230 767 S MACON 115 1	332	82.2	99.5	149 S MACON 230 767 S MACON 115 2	14	--
334 INTL PAPER 115 2312 STEMBRDG 115 1	63	26.5	99.1	18 SCHERER 500 9901 ECO1 500 1	20	--
596 RICEBORO 115 2142 CAY CRK 115 1	188	87.2	99.0	15 THALMANN 500 2158 MCCALL RD 500 1	11	--
102 E WATKNSV 1 230 492 EWATKNSV 115 1	332	87.1	98.1	122 E WATKNSV 2 230 1785 BARNETT SHL 230 1	4	--
1398 WILLARD 230 2315 N MONTICELO 230 1	596	55.7	98.1	18 SCHERER 500 9901 ECO1 500 1	20	--
334 INTL PAPER 115 824 GORDON 115 1	63	25.5	98.1	18 SCHERER 500 9901 ECO1 500 1	20	--
3 NORCROSS 500 65 NORCROSS 230 2	2016	89.7	98.0	3 NORCROSS 500 65 NORCROSS 230 1	26	--

843 VIDALIA 115 1476 W LYONS J2 115 1	135	89.1	98.0	160 HATCH 230 162 S HAZLEHRST 230 1	31	--
329 NORCROSS 115 372 NORCROS2 115 1	269	84.5	97.9	11 S HALL 500 2035 S HALL 230 1	2	--
517 KIOKEE J 115 1460 PATRTSPK 115 1	124	47.9	97.5	8 VOGTLE 500 9904 ECO4 500 1	23	--
559 GOSHEN 115 1425 CLARK RD 115 1	255	40.3	97.4	115 VOGTLE 230 116 WILSON 230 1	5	--
520 EVANS 115 1460 PATRTSPK 115 1	124	58.1	96.9	515 THOMSON 115 1413 THOMSON 230 1	3	--
588 LUDOWICI 115 2397 TOWNSEND 115 1	124	74.2	96.8	15 THALMANN 500 2158 MCCALL RD 500 1	29	--
863 ZUTA 115 2397 TOWNSEND 115 1	124	74.0	96.6	15 THALMANN 500 2158 MCCALL RD 500 1	29	--
65 NORCROSS 230 1350 SWEETBOTTOM 230 1	596	84.1	96.4	65 NORCROSS 230 1349 LIDELL RD 230 1	3	--
289 MURYLAKJ 115 297 MORROW1 115 1	135	86.5	95.6	1 KLONDIKE 500 3 NORCROSS 500 1	30	--
508 LANGSTON 115 575 STATESBORO 115 1	124	88.5	95.0	594 RIVER 115 9029 MELDRIM 115 1	11	--
70 AUSTIN DR 230 71 SNAPFINGER 230 1	497	82.8	95.0	1 KLONDIKE 500 3 NORCROSS 500 1	16	--
1966 HALLMAN RD 230 2315 N MONTICELO 230 1	602	52.9	94.8	18 SCHERER 500 9901 ECO1 500 1	20	--
311650 6PEEDEE 230 312729 6MARION 230 1	797	87.0	94.7	311381 6DALZELL 230 312710 6CROSS 230 1	33	--
71 SNAPFINGER 230 72 MINOLA DR 230 1	539	83.0	94.2	1 KLONDIKE 500 3 NORCROSS 500 1	16	--
598 GRNCUTJC 115 1425 CLARK RD 115 1	255	36.8	93.8	115 VOGTLE 230 116 WILSON 230 1	5	--
72 MINOLA DR 230 73 KLONDIKE 230 1	602	83.7	93.5	1 KLONDIKE 500 3 NORCROSS 500 1	16	--
2140 DORCHESTER 115 2142 CAY CRK 115 1	216	83.1	93.4	15 THALMANN 500 2158 MCCALL RD 500 1	11	--
269 JACKSON LK 230 1966 HALLMAN RD 230 1	602	51.5	93.4	18 SCHERER 500 9901 ECO1 500 1	20	--
5 UNION CITY 500 26 UNION CITY 230 1	1545	86.6	93.2	16 OHARA 500 171 OHARA 230 1	26	--
730 SCHR PUMP 115 756 ARKWRIGHT 115 1	100	76.5	93.1	1 KLONDIKE 500 18 SCHERER 500 1	32	--
730 SCHR PUMP 115 754 BIBB MFG 115 1	100	76.4	93.0	1 KLONDIKE 500 18 SCHERER 500 1	32	--
863 ZUTA 115 864 W BRUNSWICK 115 1	124	70.3	92.9	15 THALMANN 500 2158 MCCALL RD 500 1	29	--
171 OHARA 230 1912 JONESBORO 230 1	596	83.7	92.6	5 UNION CITY 500 26 UNION CITY 230 1	26	--
112 BARTON CHPL 230 1437 TOBACCO RD 230 1	596	15.0	92.6	8 VOGTLE 500 9904 ECO4 500 1	12	--
3052 WARTHEN 500 9903 ECO3 500 1	2701	3.8	92.3	8 VOGTLE 500 9904 ECO4 500 1	1	--
288 FAYTVL RD J 115 289 MURYLAKJ 115 1	140	83.4	92.2	1 KLONDIKE 500 3 NORCROSS 500 1	30	--
370227 3PELION2 115 370324 3OWENS C 115 1	138.8	68.5	91.9	370301 6WARD 230 370302 6GRANITE 230 1	33	--
365 PORTERDALE 230 462 PORTERDALE 115 1	314	79.6	91.6	365 PORTERDALE 230 1965 CORNISH MTN 230 1	28	--
223 DOUGLAS 230 1044 DOUGLAS 115 2	160	82.4	91.3	223 DOUGLAS 230 1044 DOUGLAS 115 1	27	--
956 HOLLY SP 115 1956 BLANKETS CK 115 1	298	84.0	91.1	11 S HALL 500 2035 S HALL 230 1	25	--
752 LLOYDSH3 115 754 BIBB MFG 115 1	100	74.2	90.7	1 KLONDIKE 500 18 SCHERER 500 1	32	--

Unit Out Scenario Explanations:

1 – Athens CTs unit out – Summer Peak with 2250 MW Interchange to FRCC
2 – Bowen 1 unit out – Summer Peak with 2250 MW Interchange to FRCC
3 – Branch 3 unit out – Summer Peak with 2250 MW Interchange to FRCC
4 – Green Co. 1 unit out – Summer Peak with 2250 MW Interchange to FRCC
5 – Hatch 1 unit out – Summer Peak with 2250 MW Interchange to FRCC
6 – Kemper unit out – Summer Peak with 2250 MW Interchange to FRCC
18 – Branch 3 unit out – Shoulder
19 – Hatch 1 unit out – Shoulder
20 – Hatch 2 unit out – Shoulder
21 – Scherer 4 unit out – Shoulder
22 – Smith 3 unit out – Shoulder
23 – Vogtle 1 unit out – Shoulder

7 – Wansley 1 unit out – Summer Peak with 2250 MW Interchange to FRCC
8 – Yates 7 unit out – Summer Peak with 2250 MW Interchange to FRCC
9 – Barry 5 unit out – Summer Peak with 3600 MW Interchange to FRCC
10 – Bowen 4 unit out – Summer Peak with 3600 MW Interchange to FRCC
11 – Hatch 1 unit out – Summer Peak with 3600 MW Interchange to FRCC
12 – Vogtle 1 unit out – Summer Peak with 3600 MW Interchange to FRCC
13 – Vogtle 2 unit out – Summer Peak with 3600 MW Interchange to FRCC
14 – Yates 7 unit out – Summer Peak with 3600 MW Interchange to FRCC
15 – Athens CTs unit out – Shoulder
16 – Bowen 1 unit out – Shoulder
17 – Bowen 4 unit out – Shoulder
24 – Yates 7 unit out – Shoulder
25 – Bowen 4 unit out – Summer Peak with 2250 MW Interchange to FRCC
26 – McDonough 5 unit out – Summer Peak with 2250 MW Interchange to FRCC
27 – Smith 3 unit out – Summer Peak with 2250 MW Interchange to FRCC
28 – Bowen 1 unit out – Summer Peak with 3600 MW Interchange to FRCC
29 – Hatch 2 unit out – Summer Peak with 3600 MW Interchange to FRCC
30 – McDonough 5 unit out – Summer Peak with 3600 MW Interchange to FRCC
31 – Smith 3 unit out – Summer Peak with 3600 MW Interchange to FRCC
32 – McDonough 5 unit out – Shoulder
33 – Miller 2 unit out – Shoulder

Interface Transfer Capability Impacts

Import and export capability studies were used to evaluate the effect of the requested transfer on interface transfer capability along the Southern Balancing Authority's interfaces.

- The requested transfer does not negatively impact the ability to meet existing firm obligations on the Entergy or the Tennessee Valley Authority interfaces.

- The requested transfer negatively impacts the ability to meet existing firm obligations on the Duke Power, South Carolina Gas and Electric, and the Santee Cooper interfaces. Southern Companies would not be able to accommodate this requested transfer and meet existing firm obligations on the above referenced interfaces without projects listed in Table 12 to alleviate the constraints identified in Table 11 below.

Table 11. Impacts to Interface Transfer Capability

Interface	Limiting Facility	Contingency	Scenario	Project
DUKE Import	Waynesboro – Wadley Primary 230 kV	Vogtle – W McIntosh 500 kV	1	I1
SCEG Import	Waynesboro – Wadley Primary 230 kV	Warthen – ECO3 500 kV	2	I1
	Goshen – Peach Orchard 230 kV	Warthen – ECO3 500 kV	3	I2
	Horsecreek – Ludowici 115 kV	Thalmann – McCall Road 500 kV	1	OG
	North Jesup – Jesup 115 kV	Thalmann – McCall Road 500 kV	1	OG
SCPSA Import	Waynesboro – Wadley Primary 230 kV	Vogtle – West McIntosh 500 kV	1	I1
	Goshen – Peach Orchard 230 kV	Warthen – ECO3 500 kV	3	I2
	Horsecreek – Ludowici 115 kV	Thalmann – McCall Road 500 kV	1	OG
	North Jesup – Jesup 115 kV	Thalmann – McCall Road 500 kV	1	OG
DUKE Export	Goat Rock – Fortson 230 kV	Goat Rock – Camp McKenzie 230 kV	5	I3

Unit Out Scenario Explanations:

1 – Hatch 1unit out – Summer Peak with 3600 MW Interchange to FRCC – Import Case
2 – Branch 3 unit out – Shoulder – Import Case
3 – Scherer 4 unit out – Shoulder – Import Case
4 – Miller 2 unit out – Summer Peak with 3600 MW Interchange to FRCC – Export Case
5 – Wansley 1 unit out – Summer Peak with 3600 MW Interchange to FRCC – Export Case

Stability Impacts

None Identified.

Table 12. Potential Solutions for Identified Constraints – *Southern Balancing Authority*

The following projects are potential solutions to address the identified constraints and are based on the assumptions used in this 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 current projected enhancements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission system expansion plans could also impact the results of this study. These potential solutions only address constraints identified within the Southern Balancing Area that are associated with the proposed transfer. Other Balancing Areas were not monitored which could result in additional limitations and required system improvements.

Item	Potential Solution	Estimated Need Date	Estimated Cost
P1	**One Year Advancement of the Bethabara 230 / 115 kV Project from 2015** • Construct a new Clarksboro 230 kV Switching Station along Center – Winder 230 kV transmission line • Construct a new Bethabara 230 / 115 kV substation • Construct approximately 14.4 miles of new 230 kV transmission line from Clarksboro to Bethabara **One Year Advancement of the East Walton 500 / 230 kV Project from 2015** • Construct a new Rockville 500 kV Switching Station along Scherer – Warthen 500 kV transmission line • Construct a new East Walton 500 / 230 kV substation • Construct approximately 47 miles of new 500 kV transmission line from East Walton to Rockville • Construct a new Bostwick 230 kV Switching Station along the East Watkinsville – East Social Circle 230 kV transmission line • Construct approximately 5, 45 miles of new 230 kV transmission line from East Walton to Bostwick • Construct approximately 13.3 miles of new double circuit 230 kV transmission line from East Walton to Bethabara • Construct approximately 13 miles of new 230 kV transmission line from East Walton to Jacks Creek	2014 2014	$3,200,000 $13,300,000
P2	**East Walton – South Hall 500 kV Transmission Line** • Advance the construction of approximately 35 miles of a new 500 kV transmission line with 3 – 1113 ACSR @ 100° C between East Walton and South Hall from 2018 • Replace the two (2) existing 300 MVA 230 / 115 kV transformers at the Gainsville 230 / 115 kV substation • Reconductor approximately 3 miles of 636 ACSR @ 100 C with 1351 ACSR @ 100 C between Lawrenceville and Lawrenceville #3 along the Lawrenceville – Moon Road 115 kV transmission line	2014	$54,500,000

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Item	Potential Solution	Estimated Need Date	Estimated Cost
P3	**Rockville – ECO2 500 kV Transmission Line** Construct approximately 35 miles of new 500 kV transmission line with 3 – 1113 ACSR @ 100 C from Rockville to a point along the Thompson – Warthen 500 kV transmission line where the generation assumption of ECO2 was located	2014	$81,700,000
P4	**Middlefork – Thomson 500 kV Transmission Line** • Advance the construction of approximately 90 miles of a new 500 kV transmission line with 3 – 1113 ACSR @ 100° C between Middlefork and Thompson from 2017	2014	$47,300,000
P5	**Wilson 230 kV Substation** • Replace two (2) 1600 amp line switches at Wilson along the Waynesboro – Wilson – Vogtle 230 kV transmission line with 2000 amp line switches	2014	$300,000
P6	**Vogtle 500 / 230 kV Substation** • Replace the existing 1344 MVA 500 / 230 kV transformer with a new 2016 MVA transformer	2014	$35,300,000
P7	**Waynesboro 230 / 115 kV Substation** • Upgrade the 115 kV #2 main bus from 1590 AAC with bundled (2-1590 AAC) conductors	2014	$50,000
I1	**Wadley Primary - Waynesboro Primary 230 kV Transmission Line** • Upgrade the transfer bus at Waynesboro Primary from 1590 AAC with bundled (2-1590 AAC) conductors • Upgrade the transfer and main buses at Wadley Primary from 1000 Copper with bundled (2-1590 AAC) conductors	2014	$500,000
I2	**Dum Jon – Goshen 230 kV Transmission Line** • Upgrade line trap, bypass and (2) switches from 1200 Amp to 1600 Amp at Goshen.	2014	$500,000
I3	**Goat Rock – Fortson 230 kV Transmission Line** • Construct a third line of approximately 10 miles with 2 – 1351 ACSR @ 100℃	2014	$20,000,000
TOTAL (2014$)			**$256,650,000**

Savannah, GA to Southern

400 MW – Summer Peak

1000 MW – Off Peak

Study Structure and Assumptions

Transfer Sensitivity	Transfer Amount	Transfer Source	Transfer Sink	Study Year
Savannah, GA to Southern (Summer Peak)	400 MW	Savannah, GA	Southern Load	2014
Load Flow Cases				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				
Source Modeled				
The source utilized for this transfer was assumed to be a new 400 MW generator interconnected into the Little Ogeechee 230 kV Bus in the Savannah Georgia area.				

Transmission System Impacts

Table 13 below identifies thermal constraints associated with the requested transfer of power for selected generation-out conditions. Other unit out conditions may also result in constraints to these or other facilities. The loadings listed in Table 13 represent the worst identified contingency and scenario for each limiting facility for the conditions studied. Other contingency and scenario conditions may also result in loadings greater than 100%.

Table 13. Transmission System Impacts – *Southern Balancing Authority*

		Thermal Loadings %				
Limiting Element	**Rating (MVA)**	**Without Request**	**With Request**	**Contingency**	**Scenario**	**Project**
The following constraints have been identified as directly attributable to the above defined transfer						
588 LUDOWICI 115 1417 HORSECRK 115 1	155	94.7	113.8	15 THALMANN 500 2158 MCCALL RD 500 1	2	OG
1099 N JESUP 115 1100 RAYONIER 115 1	124	89.6	110.3	15 THALMANN 500 2158 MCCALL RD 500 1	1	OG
1095 JESUP 115 1099 N JESUP 115 1	124	87.5	109.8	15 THALMANN 500 2158 MCCALL RD 500 1	1	OG
591 HINSVLE3 115 2140 DORCHESTER 115 1	216	96.4	104.3	9052 LTOGEECH 115 9144 RCHL–TAP 115 1	1	OG
596 RICEBORO 115 2142 CAY CRK 115 1	188	92.1	102.0	15 THALMANN 500 2158 MCCALL RD 500 1	2	OG
147 BRANCH 230 152 EATONTON SW 230 1	602	99.6	101.4	147 BRANCH 230 1689 FOREST LAKE 230 1	3	P1
100 E SOCIALCIR 230 2326 R_EATSW E–E 230 1	602	98.2	100.9	147 BRANCH 230 1689 FOREST LAKE 230 1	3	P1
489 UNION PT 115 2440 MAXEYS 115 1	124	97.8	100.5	489 UNION PT 115 1374 GREENBRO 115 1	3	P2
5235 E PELHM6 230 5281 12 OAKS 230 1	404	97.6	100.2	4374 S.BESS 6 230 4375 S.BESS 8 500 1	5	OG

The following facilities could become potential constraints in future years or with different queuing assumptions						
588 LUDOWICI 115 2397 TOWNSEND 115 1	124	82.4	97.8	15 THALMANN 500 2158 MCCALL RD 500 1	2	—
863 ZUTA 115 2397 TOWNSEND 115 1	124	82.2	97.7	15 THALMANN 500 2158 MCCALL RD 500 1	2	—
2140 DORCHESTER 115 2142 CAY CRK 115 1	216	87.4	96.1	15 THALMANN 500 2158 MCCALL RD 500 1	2	—
9021 MCINTOSH 115 370014 3JASPER2 115 1	230	84.4	94.3	9001 MCINTOSH 230 312721 6PURRYSB 230 1	6	—
863 ZUTA 115 864 W BRUNSWICK 115 1	124	78.5	93.9	15 THALMANN 500 2158 MCCALL RD 500 1	2	—
1422 GP J 115 1453 ELLABELL 115 1	155	82.2	93.0	15 THALMANN 500 2158 MCCALL RD 500 1	1	—
2140 DORCHESTER 115 2152 DORCHESTER 230	400	84.6	92.7	9052 LTOGEECH 115 9144 RCHL–TAP 115 1	1	—
153 ROBINS SP 115 828 DEEPSTEP 115 1	63	87.3	92.3	147 BRANCH 230 172 W MILLEDGVL 230 1	4	—
592 DANIELSD 115 2161 SAV_SAND 115 1	255	83.0	92.2	2140 DORCHESTER 115 2152 DORCHESTER 230	1	—
1433 FTSTEWJC 115 2161 SAV_SAND 115 1	255	82.1	91.2	2140 DORCHESTER 115 2152 DORCHESTER 230	1	—
591 HINSVLE3 115 1433 FTSTEWJC 115 1	255	82.0	91.2	2140 DORCHESTER 115 2152 DORCHESTER 230	1	—
591 HINSVLE3 115 1417 HORSECRK 115 1	216	76.4	90.4	15 THALMANN 500 2158 MCCALL RD 500 1	2	—

Unit Out Scenario Explanations:

1 – Hatch Unit 1 – Summer Peak with 3600 MW Interchange to FRCC
2 – Hatch Unit 2 – Summer Peak with 360 MW Interchange to FRCC
3 – Athens CT – Shoulder
4 – Scherer Unit 4 – Summer Peak with 2250 MW Interchange to FRCC
5 – Greene Co. Unit 2 – Summer Peak with 2250 MW Interchange to FRCC
6 – Bower Unit 4 – Summer Peak with 2250 MW Interchange to FRCC

Impacts to Interface Transfer Capability

None identified.

Stability Impacts

None identified.

Table 14. Potential Solutions for Identified Constraints – *Southern Balancing Authority*

The following projects are potential solutions to address the identified constraints and are based on the assumptions used in this 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 current projected enhancements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission system expansion plans could also impact the results of this study. These potential solutions are to only address constraints identified within the Southern Balancing Area that are associated with the proposed transfer. Other Balancing Areas were not monitored which could result in additional limitations and required system improvements.

Item	Potential Solution	Estimated Need Date	Estimated Cost
P1	**One Year Advancement of the Bethabara 230 / 115 kV Project from 2015** • Construct a new Clarksboro 230 kV Switching Station along Center – Winder 230 kV transmission line • Construct a new Bethabara 230 / 115 kV substation • Construct approximately 14.4 miles of new 230 kV transmission line from Clarksboro to Bethabara	2014	$3,200,000
	One Year Advancement of the East Walton 500 / 230 kV Project from 2015 • Construct a new Rockville 500 kV Switching Station along Scherer – Warthen 500 kV transmission line • Construct a new East Walton 500 / 230 kV substation • Construct approximately 47 miles of new 500 kV transmission line from East Walton to Rockville • Construct a new Bostwick 230 kV Switching Station along the East Watkinsville – East Social Circle 230 kV transmission line • Construct approximately 5, 45 miles of new 230 kV transmission line from East Walton to Bostwick • Construct approximately 13.3 miles of new double circuit 230 kV transmission line from East Walton to Bethabara • Construct approximately 13 miles of new 230 kV transmission line from East Walton to Jacks Creek	2014	$13,300,000
P2	**Athena – Union Point 115 kV Transmission Line** • Reconductor approximately 31.2 miles of 336 ACSR @ 100°C with 795 ACSR @ 100°C	2014	$11,300,000
TOTAL (2014$)			**$27,800,000**

Study Structure and Assumptions

Transfer Sensitivity	Transfer Amount	Transfer Source	Transfer Sink	Study Year
Savannah, GA to Southern (75% of Summer Peak)	1000 MW	Savannah, GA	Southern Load	2014
Load Flow Cases				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				
Source Modeled				
The source utilized for this transfer was assumed to be a new 400 MW generator interconnected into the Little Ogeechee 230 kV Bus in the Savannah Georgia area.				

Transmission System Impacts

Table 15 below identifies thermal constraints associated with the requested transfer of power for selected generation-out conditions. Other unit out conditions may also result in constraints to these or other facilities. The loadings listed in Table 15 represent the worst identified contingency and scenario for each limiting facility for the conditions studied. Other contingency and scenario conditions may also result in loadings greater than 100%.

Table 15. Transmission System Impacts – *Southern Balancing Authority*

		Thermal Loadings %				
Limiting Element	Rating (MVA)	Without Request	With Request	Contingency	Scenario	Project
The following constraints have been identified as directly attributable to the above defined transfer						
1099 N JESUP 115 1100 RAYONIER 115 1	124	64.1	113.2	15 THALMANN 500 2158 MCCALL RD 500 1	1	OG
1095 JESUP 115 1099 N JESUP 115 1	124	55.5	104.4	15 THALMANN 500 2158 MCCALL RD 500 1	1	OG
588 LUDOWICI 115 1417 HORSECRK 115 1	155	58.4	103.1	15 THALMANN 500 2158 MCCALL RD 500 1	1	OG
9021 MCINTOSH 115 370014 JASPER2 115 1	230	77.3	101.0	9001 MCINTOSH 230 312721 6PURRYSB 230 1	2	P1

Unit Out Scenario Explanations:

1 – Hatch Unit 1 – Summer Peak with 2250 MW interchange to FRCC
2 – Bowen Unit 4 – Summer Peak with 2250 MW Interchange to FRCC

Impacts to Interface Transfer Capability

None identified.

Stability Impacts

None Identified.

Table 16. Potential Solutions for Identified Constraints – *Southern Balancing Authority*
The following projects are potential solutions to address the identified constraints and are based on the assumptions used in this 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 current projected enhancements to the transmission system were modeled in the cases. Changes to system conditions and/or the transmission system expansion plans could also impact the results of this study. These potential solutions only address constraints identified within the Southern Balancing Area that are associated with the proposed transfer. Other Balancing Areas were not monitored which could result in additional limitations and required system improvements.

Item	Potential Solution	Estimated Need Date	Estimated Cost
P1	**McIntosh – Yemassee 115 kV Transmission Line** • Upgrade approximately 2.0 miles of 1272 ACSR @ 75º C to 100º C operation between McIntosh and Jasper	2014	$675,000
TOTAL (2014$)			**$675,000**