

**SERTP 2009 Preliminary Economic Study Results**  
**September 18, 2009**



**Southeastern Regional Transmission  
Planning Process**

**2009 Economic Sensitivity Requests  
Preliminary Results**

**September 18, 2009**



***Georgia to Peninsular Florida<sup>1</sup> (“PF”)***

***650 MW***

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<sup>1</sup> 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
GA to PF	650 MW	Northwest Georgia	PF	2014
<b>Load Flow Cases</b>				
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				

**Table 1. Transmission System Impacts – Southern Control Area**

Limiting Element	Rating (MVA)	Thermal Loadings %		Contingency	Scenario	Project
		Without Request	With Request			
<b>The following constraints have been identified as directly attributable to the above defined transfer</b>						
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	P 7
208 NELSON 230 954 NELSON 115 1	180	99.2	101.3	208 NELSON 230 954 NELSON 115 2	1	OG
<b>The following facilities could become potential constraints in future years or with different queuing assumptions</b>						
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

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**Table 2. Potential Solutions for Identified Constraints – Southern Control Area**

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	<p><b>North Americus – North Tifton 115 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>Upgrade approximately 6.58 miles of 336 ACSR @ 50° C to 100°C operation between Ashburn Junction and Do les Junction</li> </ul>	2014	\$1,350,000
P2	<p><b>Douglas – Kettle Creek Primary 115 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>Upgrade approximately 4.3 miles of 336 ACSR @ 75° C to 100°C operation between Douglas and Oak Park</li> </ul>	2014	\$900,000
P3	<p><b>Thalmann – Duval 500 kV Transmission Line</b></p> <p>The limiting element for this facility is within Peninsular Florida.</p>	2014	N/A
P4	<p><b>Lloyd Shoals – South Griffin 115 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>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</li> </ul>	2014	\$500,000
P5	<p><b>Barneyville – Pine Grove Primary 115 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>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</li> <li>Replace one (1) 600 amp line switch at Adel #1 Junction</li> </ul>	2014	\$250,000
P6	<p><b>Mitchell – Moultrie 115 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>Reconductor approximately 8 miles of 336 ACSR @ 100° C with 795 ACSR @ 100°C between Mitchell and Lester</li> <li>Replace two (2) 600 amp line switches at Mitchell and one (1) 600 amp line switch at Lester</li> </ul>	2014	\$3,000,000

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Item	Potential Solution	Estimated Need Date	Estimated Cost
P7	<b>Jasper – Pine Grove Primary 115 kV Transmission Line</b> <ul style="list-style-type: none"> <li>• Reconductor approximately 30 miles of 2/0 copper @ 50° C with 795 ACSR @ 100° C from Pinegrove to Jasper</li> </ul>	2014	\$11,000,000
<b>TOTAL (\$2014)</b>			<b>\$17,000,000<sup>2</sup></b>

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<sup>2</sup> This cost does not include any potential cost associated with possible interface constraints.

***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
<b>Load Flow Cases</b>				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				

**Table 3. Transmission System Impacts – Southern Control Area**

Limiting Element	Rating (MVA)	Thermal Loadings %		Contingency	Scenario	Project
		Without Request	With Request			
<b>The following constraints have been identified as directly attributable to the above defined transfer</b>						
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
<b>The following facilities could become potential constraints in future years or with different queuing assumptions</b>						
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 – Summer Peak with 2250 MW Interchange to FRCC
- 2 – Bowen Unit 4 – Summer Peak with 2250 MW Interchange to FRCC
- 3 – Athens CT – Summer Peak with 3600 MW Interchange to FRCC

- 4 – Bowen Unit 4 – Summer Peak with 3600 MW Interchange to FRCC
- 5 – Gaston Unit 5 – Summer Peak with 2250 MW Interchange to FRCC

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**Table 4. Potential Solutions for Identified Constraints – Southern Control Area**

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	<b>Avalon Junction – Bio 115 kV Transmission Line</b> <ul style="list-style-type: none"> <li>• Upgrade approximately 8.5 miles of 795 ACSR @ 100° C to 125° C operation between Airline #2 to North Lavonia</li> </ul>	2014	\$3,800,000
P2	<b>Gainesville # 2 115 kV Substation</b> <ul style="list-style-type: none"> <li>• Replace Low-side 1590 AAC Jumpers with 2000 AAC Jumpers</li> <li>• Upgrade the 115 kV #2 main bus from 1590 AAC with bundled (2–1590 AAC) conductors</li> </ul>	2014	\$200,000
<b>TOTAL (\$2014)</b>			<b>\$4,000,000<sup>3</sup></b>

<sup>3</sup> This cost does not include any potential cost associated with possible interface constraints.



***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
<b>Load Flow Cases</b>				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				

It is important to note that the above defined transfer's source is located within the Southwest Quadrant ("SWQ") stability-limited region which has been identified on Southern Companies' OASIS. Wide area stability analysis has identified that the above defined transfer has a negative impact to the SWQ. Enhancements to alleviate the SWQ constraint are listed in table 6 as project P1. The following table contains transmission system impacts resulting from of the above defined transfer and includes the enhancements to address the SWQ limitations.

**Table 5. Transmission System Impacts – Southern Control Area**

Limiting Element	Rating (MVA)	Thermal Loadings %		Contingency	Scenario	Project
		Without Request	With Request			
<b>The following constraints have been identified as directly attributable to the above defined transfer</b>						
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	P10
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	P9
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 RVRFRJTJC 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
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 STWARDJ3 115 1500 CHLORIDE 115 1	124	96.8	101.0	614 BROOKHV3 115 1561 RVRFRJTJC 115 1	9	P8

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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
<b>The following facilities could become potential constraints in future years or with different queuing assumptions</b>														
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 PINEDAILE	115	1	6	—

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#### **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

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**Table 6. Potential Solutions for Identified Constraints – Southern Control Area**

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	<p><b>Daniel – Snowdoun 500 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>• Construct approximately 90 miles of new 500 kV transmission line with 3 – 1033 ACSR @ 100°C from North Brewton to Snowdoun</li> <li>• Convert approximately 60.6 miles of 230 kV transmission line to 500 kV operation between Ellicott and North Brewton</li> <li>• 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</li> <li>• Convert approximately 22.1 miles of 230 kV transmission line to 500 kV operation between Daniel and Big Creek</li> <li>• 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</li> <li>• Reconductor approximately 8.9 miles of the existing Daniel – Wade 230 kV transmission line (1351 ACSR @ 100°C) with 2 – 1351 ACSS @ 160°C</li> </ul>	2014	\$340,000,000
P2	<p><b>Daniel – Bennett 230 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>• Construct approximately 11 miles of new 230 kV transmission line with 1351 ACSR @ 100°C from Daniel to a new 230 / 115 kV substation along the existing Moss Point East – Theodore 230 kV transmission line</li> </ul>	2014	\$23,000,000
P3	<p><b>Barry – Crist 230 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>• Advance the upgrade of approximately 61.5 miles of 1351 ACSR @ 100°C to 125°C operation from 2016</li> </ul>	2014	\$2,200,000
P4	<p><b>South Montgomery – Union Spring 115 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>• Reconductor approximately 4.9 miles of 397 ACSR @ 100°C with 795 ACSR @ 100°C between ECI Halstead Tap and Merry Tap</li> </ul>	2014	\$3,500,000

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Item	Potential Solution	Estimated Need Date	Estimated Cost
P5	<b>Pike County – Snowdown 230 kV Transmission Line</b> <ul style="list-style-type: none"> <li>Upgrade approximately 32.3 miles of 1033 ACSR @ 93° C to 125°C operation</li> </ul>	2014	\$18,300,000
P6	<b>Farley – South Bainbridge 230 kV Transmission Line</b> <ul style="list-style-type: none"> <li>Install a 1% line reactor at South Bainbridge Substation in the South Bainbridge – Farley 230 kV Transmission line</li> </ul>	2014	\$2,500,000
P7	<b>Anniston – Bynum 230 kV Transmission Line</b> <ul style="list-style-type: none"> <li>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</li> </ul>	2014	\$10,000,000
P8	<b>Bull Creek – Victory Drive 115 kV Transmission Line</b> <ul style="list-style-type: none"> <li>Reconductor approximately 2.5 miles of 336 ACSR @ 100 C with 795 ACSR @ 100 C between Victory Drive and Saint Mary's Road Tap</li> </ul>	2014	\$2,500,000
P9	<b>Crooked Creek – Martin Dam 115 kV Transmission Line</b> <ul style="list-style-type: none"> <li>Upgrade approximately 46.5 miles of 397 ACSR @ 50° C to 100°C operation</li> </ul>	2014	\$8,500,000
P10	<b>Madison Park – Thurlow Dam 115 kV Transmission Line</b> <ul style="list-style-type: none"> <li>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</li> </ul>	2014	\$750,000
<b>TOTAL (\$2014)</b>			<b>\$411,250,000<sup>4</sup></b>

<sup>4</sup> This cost does not include any potential cost associated with possible interface constraints.

***Washington Co. to Georgia***

***5000 MW***

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**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
<b>Load Flow Cases</b>				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				

**Table 7. Transmission System Impacts – Southern Control Area**

Limiting Element	Rating (MVA)	Thermal Loadings %		Contingency	Scenario	Project
		Without Request	With Request			
<b>The following constraints have been identified as directly attributable to the above defined transfer</b>						
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	P1
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



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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	P8
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 LVLEJCT 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

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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
<b>The following facilities could become potential constraints in future years or with different queuing assumptions</b>						
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 SNAPPFINGER 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	--

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311650 6PEEDEE 230 312729 6MARION 230 1	797	87.0	94.7	311381 6DALZELL 230 312710 6CROSS 230 1	33	--
71 SNAPPINGER 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  
 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

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  
 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

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**Table 8. Potential Solutions for Identified Constraints – Southern Control Area**

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	<p><b>One Year Advancement of the Bethabara 230 / 115 kV Project from 2015</b></p> <ul style="list-style-type: none"> <li>• Construct a new Clarksboro 230 kV Switching Station along Center – Winder 230 kV transmission line</li> <li>• Construct a new Bethabara 230 / 115 kV substation</li> <li>• Construct approximately 14.4 miles of new 230 kV transmission line from Clarksboro to Bethabara</li> </ul>	2014	\$3,200,000
	<p><b>One Year Advancement of the East Walton 500 / 230 kV Project from 2015</b></p> <ul style="list-style-type: none"> <li>• Construct a new Rockville 500 kV Switching Station along Scherer – Warthen 500 kV transmission line</li> <li>• Construct a new East Walton 500 / 230 kV substation</li> <li>• Construct approximately 47 miles of new 500 kV transmission line from East Walton to Rockville</li> <li>• Construct a new Bostwick 230 kV Switching Station along the East Watkinville – East Social Circle 230 kV transmission line</li> <li>• Construct approximately 5, 45 miles of new 230 kV transmission line from East Walton to Bostwick</li> <li>• Construct approximately 13.3 miles of new double circuit 230 kV transmission line from East Walton to Bethabara</li> <li>• Construct approximately 13 miles of new 230 kV transmission line from East Walton to Jacks Creek</li> </ul>	2014	\$13,300,000
P2	<p><b>East Walton – South Hall 500 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Replace the two (2) existing 300 MVA 230 / 115 kV transformers at the Gainesville 230 / 115 kV substation</li> <li>• 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</li> </ul>	2014	\$54,500,000

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P3	<b>Rockville – ECO2 500 kV Transmission Line</b> 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	<b>Middlefork – Thomson 500 kV Transmission Line</b> <ul style="list-style-type: none"> <li>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</li> </ul>	2014	\$47,300,000
P5	<b>Wilson 230 kV Substation</b> <ul style="list-style-type: none"> <li>Replace two (2) 1600 amp line switches at Wilson along the Waynesboro – Wilson – Vogtle 230 kV transmission line with 2000 amp line switches</li> </ul>	2014	\$300,000
P6	<b>Vogtle 500 / 230 kV Substation</b> <ul style="list-style-type: none"> <li>Replace the existing 1344 MVA 500 / 230 kV transformer with a new 2016 MVA transformer</li> </ul>	2014	\$35,300,000
P7	<b>Waynesboro 230 / 115 kV Substation</b> <ul style="list-style-type: none"> <li>Request to re-rate the existing 280 MVA transformer to match the 115 kV bus rating of 298 MVA</li> </ul>	2014	\$0
P8	<b>Jesup – Ludowici Primary 115 kV Transmission Line</b> <ul style="list-style-type: none"> <li>Reconductor approximately 4.9 miles of 336 ACSR @ 100° C with 795 ACSR @ 100° C between North Jesup and Rayonier.</li> </ul>	2014	\$1,750,000
<b>TOTAL (\$2014)</b>			<b>\$237,350,000<sup>5</sup></b>

<sup>5</sup> This cost does not include any potential cost associated with possible interface constraints.

***Savannah, GA to Southern***

***400 MW – Summer Peak***

***1000 MW – Off Peak***

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**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
<b>Load Flow Cases</b>				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				

**Table 9. Transmission System Impacts – Southern Control Area**

Limiting Element	Rating (MVA)	Thermal Loadings %		Contingency	Scenario	Project
		Without Request	With Request			
<b>The following constraints have been identified as directly attributable to the above defined transfer</b>						
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
<b>The following facilities could become potential constraints in future years or with different queuing assumptions</b>						
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	—

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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	—

**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



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**Table 10. Potential Solutions for Identified Constraints – Southern Control Area**

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	<p><b>One Year Advancement of the Bethabara 230 / 115 kV Project from 2015</b></p> <ul style="list-style-type: none"> <li>• Construct a new Clarksboro 230 kV Switching Station along Center – Winder 230 kV transmission line</li> <li>• Construct a new Bethabara 230 / 115 kV substation</li> <li>• Construct approximately 14.4 miles of new 230 kV transmission line from Clarksboro to Bethabara</li> </ul> <p><b>One Year Advancement of the East Walton 500 / 230 kV Project from 2015</b></p> <ul style="list-style-type: none"> <li>• Construct a new Rockville 500 kV Switching Station along Scherer – Warthen 500 kV transmission line</li> <li>• Construct a new East Walton 500 / 230 kV substation</li> <li>• Construct approximately 47 miles of new 500 kV transmission line from East Walton to Rockville</li> <li>• Construct a new Bostwick 230 kV Switching Station along the East Watkinsville – East Social Circle 230 kV transmission line</li> <li>• Construct approximately 5, 45 miles of new 230 kV transmission line from East Walton to Bostwick</li> <li>• Construct approximately 13.3 miles of new double circuit 230 kV transmission line from East Walton to Bethabara</li> <li>• Construct approximately 13 miles of new 230 kV transmission line from East Walton to Jacks Creek</li> </ul>	2014	\$3,200,000
			2014
P2	<p><b>Athena – Union Point 115 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>• Reconductor approximately 31.2 miles of 336 ACSR @ 100°C with 795 ACSR @ 100°C</li> </ul>	2014	\$11,300,000
<b>TOTAL (\$2014)</b>			<b>\$27,800,000<sup>6</sup></b>

<sup>6</sup> This cost does not include any potential cost associated with possible interface constraints.

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**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
<b>Load Flow Cases</b>				
2009 Series Version 2A: Summer Peak with 2250 MW Interchange to FRCC, Summer Peak with 3600 MW Interchange to FRCC, and Shoulder				

**Table 11. Transmission System Impacts – Southern Control Area**

Limiting Element	Rating (MVA)	Thermal Loadings %		Contingency	Scenario	Project
		Without Request	With Request			
<b>The following constraints have been identified as directly attributable to the above defined transfer</b>						
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

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**Table 12. Potential Solutions for Identified Constraints – Southern Control Area**

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
<b>P1</b>	<p><b>McIntosh – Yemassee 115 kV Transmission Line</b></p> <ul style="list-style-type: none"> <li>• Upgrade approximately 2.0 miles of 1272 ACSR @ 75° C to 100° C operation between McIntosh and Jasper</li> </ul>	2014	\$675,000
<b>TOTAL (\$2014)</b>			<b>\$675,000<sup>7</sup></b>

<sup>7</sup> This cost does not include any potential cost associated with possible interface constraints.