



***Feasibility Study  
PID 289  
425MW Plant***

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# Energy Resource Interconnection Service

## 1. Introduction

This Energy Resource Interconnection Service (ERIS) is based on the PID 289 request 425MW interconnection on Entergy's transmission system located at the Jacinto 230kV substation. The proposed commercial operation date of the project is January 1, 2017. The objective of this study is to assess the reliability impact of the new facility on the Entergy transmission system as well as its effects on the system's existing short circuit current capability. It is also intended to determine whether the transmission system meets standards established by NERC Reliability Standards and Entergy's planning guidelines when the plant is connected to Entergy's transmission system. If not, transmission improvements will be identified.

The Feasibility Study process required a load flow analysis to determine if the existing transmission lines are adequate to handle the full output from the plant for simulated transfers to adjacent control areas. A short circuit analysis is performed to determine if the generation would cause the available fault current to surpass the fault duty of existing equipment within the Entergy transmission system.

This ERIS Feasibility Study was based on information provided by the Customer and assumptions made by Entergy's Independent Coordinator of Transmission (ICT) planning group and Entergy's Transmission Technical System Planning group. All supplied information and assumptions are documented in this report. If the actual equipment installed is different from the supplied information or the assumptions made, the results outlined in this report are subject to change.

The load flow results from the ERIS study are for information only. ERIS does not in and of itself convey any transmission service.

## 2. Short circuit Analysis/Breaker Rating Analysis

### 2.1 Model Information

The short circuit analysis was performed on the Entergy system short circuit model using ASPEN software. This model includes all generators interconnected to the Entergy system or interconnected to an adjacent system and having an impact on this interconnection request, IPP's with signed IOAs, and approved future transmission projects on the Entergy transmission system.

### 2.2 Short Circuit Analysis

The method used to determine if any short circuit problems would be caused by the addition of the PID 289 generation is as follows:

Three-phase and single-phase to ground faults were simulated on the Entergy base case short circuit model and the worst case short circuit level was determined at each station. The PID 289 generator was then modeled in the base case to generate a revised short circuit model. The base case short circuit results were then compared with the results from the revised model to identify any breakers that were under-rated as a result of additional short circuit contribution from PID 289 generation. Any breakers identified to be upgraded through this comparison are mandatory upgrades.

## 2.3 Analysis Results

The results of the short circuit analysis indicated that the additional generation due to PID 289 generation caused no increase in short circuit current such that they exceeded the fault interrupting capability of the high voltage circuit breakers within the vicinity of the PID 289 plant **with and without priors**. Priors included are: 247, 250, 266, 268, 287, and 289.

## 2.4 Problem Resolution

As a result of the short circuit analysis findings, no resolution was required.

# 3. Load Flow Analysis

## 3.1 Model Information

The load flow analysis was performed based on the projected 2017 summer peak load flow model. Approved future transmission projects in the 2012 ICT Base Plan were used in the models for scenarios three and four. These upgrades can be found on Entergy's OASIS web page at <http://www.oatioasis.com/EES/EESDocs/Disclaimer.html>.

The loads were scaled based on the forecasted loads for the year. All firm power transactions between Entergy and its neighboring control areas were modeled for the year 2017 excluding short-term firm transactions on the same transmission interface. An economic dispatch was carried out on Entergy generating units after the scaling of load and modeling of transactions. The PID 289 generation interconnection point was modeled at the Jacinto 230kV substation. These associated facilities were then modeled in the case to build a revised case for the load flow analysis. Transfers were simulated between thirteen (13) control areas and Entergy using the requesting generator as the source and adjacent control area as sink.

This study considered the following four scenarios:

Scenario No.	Approved Future Transmission Projects	Pending Transmission Service & Study Requests
1	Not Included	Not Included
2	Not Included	Included
3	Included	Not Included
4	Included	Included

The generator step-up transformers, generators, and interconnecting lines were modeled according to the information provided by the customer.

## 3.2 Load Flow Analysis

### 3.2.1 Load Flow Analysis:

The load flow analysis was performed as a DC analysis using PSS/E and PSS/MUST software by Power Technologies Incorporated (PTI). A Transmission Reliability Margin (TRM) value that effectively reduced line ratings by 5% was used in the model. With the above assumptions implemented, the First Contingency Incremental Transfer Capability (FCITC) values are calculated. The FCITC depends on various factors – the system load, generation dispatch, scheduled maintenance of equipment, and the configuration of the interconnected

system and the power flows in effect among the interconnected systems. The FCITC is also dependent on previously confirmed firm reservations on the interface. The details of each scenario list each limiting element, the contingency for the limiting element, and the Available Transfer Capacity (ATC). The ATC is equal to the FCITC.

### 3.2.2 Performance Criteria

The criteria for overload violations are as follows:

#### A) With All Lines in Service

- The MVA flow in any branch should not exceed Rate A (normal rating).

#### B) Under Contingencies

- The MVA flow through any facility should not exceed 95% Rate A.

### 3.3 Analysis Results

Summary of the analysis results are documented in following table for each scenario.

**Table 3.3.1: Summary of Results for PID 289 – ERIS Load Flow Study**

Interface		Summer Peak Case Used	FCITC Available for Scenario 1	FCITC Available for Scenario 2	FCITC Available for Scenario 3	FCITC Available for Scenario 4
AECI	Associated Electric Cooperative, Inc.	2017	-522	-2094	-502	-2001
AEPW	American Electric Power West	2017	-252	-2076	-242	-393
AMRN	Ameren Transmission	2017	58	-1755	57	-1735
CLEC	CLECO	2017	63	-55	62	-84
EAI	Entergy Arkansas	2017	58	-78	57	-119
EES	Entergy LA., TX., and N.O.	2017	62 *	-81 *	61 *	-123 *
EESLoad	Entergy System Load	2017	52 *	4421 *	51 *	-797 *
EMI	Entergy Mississippi	2017	61 *	-4366	60 *	-1359
EMDE	Empire District Electric Co	2017	-441	-1260	-423	-458
LAFSA	Lafayette Utilities System	2017	-996	-274 *	-995	-267 *
LAGN	Louisiana Generating, LLC	2017	68 *	-3687 *	67 *	-3516 *
LEPA	Louisiana Energy & Power Authority	2017	-1602	-8897 *	-1655	-2571 *
OKGE	Oklahoma Gas & Electric Company	2017	-372	-1359	-357	-256
SMEPA	South Mississippi Electric Power Assoc.	2017	-695 *	-3297 *	61 *	-1131 *
SOCO	Southern Company	2017	60 *	-2115 *	59 *	-2088 *
SPA	Southwest Power Administration	2017	-475	-1147	-457	-248
TVA	Tennessee Valley Authority	2017	59 *	-1744 *	58 *	-1721 *

\*FCITC value excludes values calculated on supplemental upgrades.

**TABLE 3.3.2: DETAILS OF SCENARIO 1 RESULTS: (WITHOUT FUTURE PROJECTS AND WITHOUT PENDING TRANSMISSION SERVICE & STUDY REQUEST)**

Limiting Elements	Est. Cost	AECI	AEPW	AMRN	CLECO	EAI	EES	EESLoad	EMDE	EMI	LAFa	LAGN	LEPA	OKGE	SMEPA	SOCO	SPA	TVA
Caney Creek - Lewis Creek SES 138kV	6,900,000	X		X	X	X		X	X	X		X			X	X	X	X
Champagne - Plaisance (CLECO) 138kV	Included in 2012 ICT BP										X		X					
Cleveland - Tarking 138kV	11,500,000	X		X	X	X	X	X		X		X			X	X		X
Conway West - Lake Conway 115kV	8,100,000																X	
Conway West 161/115kV transformer	TBD																X	
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Other Ownership										X							
Eldorado EHV 500/115kV transformer	TBD					X				X								
Florence - South Jackson 115kV - Supplemental Upgrade	Committed to by Others														X			
Greenwood - Terrebone 115kV	12,700,000												X					
Jackson Miami - Jackson Monument Street 115kV	2,850,000														X			
Jackson Miami - Rex Brown-W 115kV	2,800,000														X			
Keo - West Memphis EHV 500kV	570,000	X		X						X		X	X		X	X		X
Keo - White Bluff 500kV	2,935,000	X	X	X				X	X	X		X	X	X	X	X	X	X
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Included in 2012 ICT BP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lake Conway - Mayflower 115kV	3,900,000																X	
Mabelvale - Sheridan 500kV	Included in 2012 ICT BP	X	X	X				X	X	X			X	X	X	X	X	X
North Crowley - Scott1 138kV	21,375,000	X		X		X		X	X	X	X	X		X	X	X	X	X
Pleasant Hill 500/161kV transformer	Included in 2012 ICT BP								X								X	
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Committed to by Others						X	X			X	X	X		X	X		X
Ray Braswell - West Jackson 115kV	5,250,000														X			
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Committed to by Others									X					X			

Limiting Elements	Est. Cost	AECI	AEPW	AMRN	CLECO	EAI	EES	EESLoad	EMDE	EMI	Lafa	LAGN	LEPA	OKGE	SMEPA	SOCO	SPA	TVA
Semere - Scott2 138kV	Included in 2012 ICT BP										X							
South Jackson - West Jackson 115kV	6,200,000														X			
Terrebone - Coteau 115kV	5,000,000												X					
Vacherie - Waterford 230kV	25,488,540												X					
Vatican - Scott1 138kV	Included in 2012 ICT BP												X					
West Memphis 500/161kV transformer	8,890,000	X		X												X		X

**TABLE 3.3.3: DETAILS OF SCENARIO 2 RESULTS: (WITHOUT FUTURE PROJECTS AND WITH PENDING TRANSMISSION SERVICE & STUDY REQUEST)**

Limiting Elements	Est. Cost	AECI	AEPW	AMRN	CLECO	EAI	EES	EESLoad	EMDE	EMI	LAFA	LAGN	LEPA	OKGE	SMEPA	SOCO	SPA	TVA
Caney Creek - Lewis Creek SES 138kV	6,900,000	X		X	X	X		X	X	X		X			X	X	X	X
Champagne - Plaisance (CLECO) 138kV	Included in 2012 ICT BP										X		X					
Cleveland - Tarking 138kV	11,500,000				X		X	X		X		X			X	X		X
Conway West - Lake Conway 115kV	8,100,000																X	
Conway West 161/115kV transformer	TBD																X	
Florence - South Jackson 115kV - Supplemental Upgrade	Committed to by Others														X			
Greenwood - Terrebone 115kV	12,700,000												X					
Jackson Miami - Jackson Monument Street 115kV	2,850,000														X			
Jackson Miami - Rex Brown-W 115kV	2,800,000														X			
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Included in 2012 ICT BP	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Lake Conway - Mayflower 115kV	3,900,000																X	
Mabelvale - Sheridan 500kV	Included in 2012 ICT BP	X	X	X				X	X	X				X	X	X	X	X
North Crowley - Scott1 138kV	21,375,000	X		X		X		X	X	X	X	X		X	X	X	X	X
Pleasant Hill 500/161kV transformer	Included in 2012 ICT BP								X								X	
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Committed to by Others						X	X			X	X	X		X	X		X
Ray Braswell - West Jackson 115kV	5,250,000														X			
Semere - Scott2 138kV	Included in 2012 ICT BP										X							
South Jackson - West Jackson 115kV	6,200,000														X			
Terrebone - Coteau 115kV	5,000,000												X					
Vacherie - Waterford 230kV	25,488,540												X					
Vatican - Scott1 138kV	Included in 2012 ICT BP												X					
West Memphis 500/161kV transformer	8,890,00	X		X												X		X



**TABLE 3.3.4: DETAILS OF SCENARIO 3 RESULTS: (WITH FUTURE PROJECTS AND WITHOUT PENDING TRANSMISSION SERVICE & STUDY REQUEST)**

Limiting Elements	Est. Cost	AECI	AEPW	AMRN	CLECO	EAI	EES	EESLoad	EMDE	EMI	LAFA	LAGN	LEPA	OKGE	SMEPA	SOCO	SPA	TVA
Champagne - Plaisance (CLECO) 138kV	Included in 2012 ICT BP										X		X					
Cleveland - Jacinto 138kV	5,800,000		X					X						X				
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Other Ownership										X		X					
Fancy Point - Port Hudson 230kV ckt 1	210,000												X					
Fancy Point - Port Hudson 230kV ckt 2													X					
Florence - South Jackson 115kV - Supplemental Upgrade	Committed to by Others														X			
Greenwood - Terrebone 115kV	12,700,000												X					
International Paper - Mansfield 138kV (CLECO)	Other Ownership	X	X						X					X			X	
International Paper - Wallake 138kV (CLECO)	Other Ownership	X	X						X					X			X	
Jacinto - Splendora 138kV	15,800,000	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Jackson Miami - Rex Brown-W 115kV	2,800,000														X			
Plantation - Cedar Hill 138kV	TBD		X											X				
Port Hudson 230/138 transformer 2	210,000												X					
Quitman - Hamlet 161kV	TBD																X	
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Committed to by Others						X	X			X	X	X		X	X		X
Ray Braswell 500/115kV transformer 1	TBD														X			
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Committed to by Others									X					X			
South Jackson - West Jackson 115kV	6,200,000														X			
Terrebone - Coteau 115kV	5,000,000												X					
Vatican - Scott1 138kV	Included in 2012 ICT BP												X					
Winnfield 230/115kV transformer	6,560,000	X	X	X		X			X					X			X	X

**TABLE 3.3.5: DETAILS OF SCENARIO 4 RESULTS: (WITH FUTURE PROJECTS AND WITH PENDING TRANSMISSION SERVICE & STUDY REQUEST)**

Limiting Elements	Est. Cost	AECI	AEPW	AMRN	CLECO	EAI	EESLoad	EES	EMDE	EMI	LAFa	LAGN	LEPA	OKGE	SMEPA	SOCO	SPA	TVA
Caney Creek - Lewis Creek SES 138kV	6,900,000	X		X	X	X		X	X	X		X			X	X	X	X
Champagne - Plaisance (CLECO) 138kV	Included in 2012 ICT BP										X	X	X					
Cleveland - Tarking 138kV	11,500,000				X		X	X		X		X			X	X		X
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Other Ownership										X							
Eldorado EHV 500/115kV transformer	TBD					X				X								
Florence - South Jackson 115kV - Supplemental Upgrade	Committed to by Others														X			
Greenwood - Terrebone 115kV	12,700,000												X					
Jackson Miami - Rex Brown-W 115kV	2,800,000														X			
Keo - West Memphis EHV 500kV	570,000	X		X						X		X	X		X	X		X
Keo - White Bluff 500kV	2,935,000	X	X	X				X	X	X		X	X	X	X	X	X	X
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Included in 2012 ICT BP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Quitman - Hamlet 161kV	TBD								X								X	
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Committed to by Others						X	X			X	X	X		X	X		X
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Committed to by Others														X			
Roy S. Nelson 500/230kV transformer	TBD														X			
South Jackson - West Jackson 115kV	6,200,000														X			
Vacherie - Waterford 230kV	25,488,540												X					
Vatican - Scott1 138kV	Included in 2012 ICT BP												X					
West Memphis 500/161kV transformer	8,890,000	X		X												X		X

## APPENDIX A: Approved Projects and Transactions in Study Mode

Prior Generation Interconnection NRIS requests that were included in this study:

PID	Substation	MW	In Service Date
PID 247	Stowell 138kV	180	10/1/2010
PID 287	Lewis Creek 138kV	340	12/1/2009

Prior transmission service requests that were included in this study:

OASIS #		PSE	MW	Begin	End
74846159		AEPM	65	1/1/2015	1/1/2020
75206836		ETEC	125	1/1/2015	2/1/2020
SPP 75108838		Tenaska Power Services	6	8/1/2011	6/1/2014
SPP 75108845		Tenaska Power Services	44	8/1/2011	6/1/2014
SPP 75191922		AEP	70-73	8/1/2011	6/1/2014
SPP 75197442		AECC	170	8/1/2011	6/1/2014
SPP 75113025		Tenaska Power Services	12	8/1/2011	1/1/2017
76234876		Entergy Services (SPO)	1	6/1/2012	6/1/2042
76234879		Entergy Services (SPO)	194	6/1/2012	6/1/2042
76234904		Entergy Services (SPO)	1	6/1/2012	6/1/2042
76234916		Entergy Services (SPO)	140	6/1/2012	6/1/2042
76234922		Entergy Services (SPO)	1	5/1/2013	5/1/2042
76234951		Entergy Services (SPO)	5	5/1/2013	5/1/2042
76234980		Entergy Services (SPO)	1	1/1/2014	1/1/2043
76234993		Entergy Services (SPO)	475	1/1/2014	1/1/2043
76235000					
76235003					
76235101		NRG Power Marketing	450	1/1/2014	1/1/2024
76238089		Entergy Services (SPO)	20	1/1/2014	1/1/2043
76360751		NRG Power Marketing	1	1/1/2014	1/1/2020
76360754		NRG Power Marketing	103	1/1/2014	1/1/2020
76360758		NRG Power Marketing	1	1/1/2014	1/1/2020
76360762		NRG Power Marketing	206	1/1/2014	1/1/2020
76523750		SRMP	180	6/1/2012	6/1/2018
76523753		SRMP	30	6/1/2012	6/1/2018
76523754		EWOM	45	6/1/2012	6/1/2016
76525269		Entegra Power (PUPP)	515	5/1/2013	5/1/2018
76525276		Entegra Power (PUPP)	515	5/1/2015	5/1/2020
76572960		Cargill Power Markets	101	7/1/2013	7/1/2023
76572966		Cargill Power Markets	200	1/1/2014	1/1/2024
76572967		Cargill Power Markets	200	1/1/2014	1/1/2024
76572969		Cargill Power Markets	100	1/1/2014	1/1/2024
76582319		Cargill Power Markets	200	6/1/2013	6/1/2033
76583976		Arkansas Electric Cooperative Corp (AECC)	660	9/1/2012	9/1/2017
76583995		Arkansas Electric Cooperative Corp (AECC)	200	9/1/2012	9/1/2017
76600643		Horizon Wind	100	3/1/2014	3/1/2019
76611184		NRG Power Marketing	1	6/1/2012	6/1/2019
76611182		NRG Power Marketing	25	6/1/2012	6/1/2019
76617645		Entegra Power (PUPP)	515	1/1/2016	1/1/2021
76617646		Entegra Power (PUPP)	515	1/1/2016	1/1/2021

## APPENDIX B: Details of Scenario 1 - 2017

### AECI

Limiting Element	Contingency Element	ATC
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-522
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-42
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	57
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	57
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	100
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	102
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	250

### AEPW

Limiting Element	Contingency Element	ATC
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-252
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-21
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	51
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	51
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	89
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	90
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	224
Plantation - Cedar Hill 138kV	Oak Ridge - Porter 138kV	265
Cleveland - Jacinto 138kV	Jacinto - Peach Creek 230kV	410

### AMRN

Limiting Element	Contingency Element	ATC
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	58
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	58
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	101
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	103
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	259

### CLECO

Limiting Element	Contingency Element	ATC
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	63

Limiting Element	Contingency Element	ATC
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	63
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	110
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	112

#### EAI

Limiting Element	Contingency Element	ATC
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	58
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	58
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	102
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	104
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	223

#### EESSLoad

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-824
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	52
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	52
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	92
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	93
Cleveland - Jacinto 138kV	Jacinto - Peach Creek 230kV	409

#### EES

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-812
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	62
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	62
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	109
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	111

**EMDE**

<b>Limiting Element</b>	<b>Contingency Element</b>	<b>ATC</b>
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-441
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-36
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	56
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	56
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	98
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	100
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	242

**EMI**

<b>Limiting Element</b>	<b>Contingency Element</b>	<b>ATC</b>
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams - Pickens 230kV	-9065
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Duke Hinds-1 - Lakeover 230kV	-9063
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton - Pickens 230kV	-9052
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton South - Canton 230kV	-8779
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Webre - Wells 500kV	-8621
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Bogalusa - Adams Creek 500/230kV transformer	-8500
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Bogalusa - Franklin 500kV	-8500
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton - Yandell Road 230kV	-8397
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Vicksburg - Waterways 115kV	-8321
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	East Vicksburg - Waterways 115kV	-8279
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Base Case	-7649
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	61
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	61
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	107
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	109

**Lafa**

Limiting Element	Contingency Element	ATC
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-996
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-988
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-829
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-826
Champagne - Plaisance (CLECO) 138kV	West Fork - Wells 230kV	-738
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-665
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-604
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-559
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-446
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-389
Coughlin (CLECO) - Plaisance 138kV (CLECO)	West Fork - Wells 230kV	-301
Champagne - Plaisance (CLECO) 138kV	Colfax (CLECO) - Rodemacher 230kV	15
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	68
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	68
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	120
Champagne - Plaisance (CLECO) 138kV	Colfax (CLECO) - Montgomery 230kV	122
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	122

**LAGN**

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-479
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	68
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	68
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	120
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	122

**LEPA**

Limiting Element	Contingency Element	ATC
Vatican - Scott1 138kV	Coughlin (CLECO) - Plaisance 138kV (CLECO)	-1602

Limiting Element	Contingency Element	ATC
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-1338
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-1208
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-1124
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-1002
Champagne - Plaisance (CLECO) 138kV	West Fork - Wells 230kV	-895
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-818
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-678
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-604
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-472
Coughlin (CLECO) - Plaisance 138kV (CLECO)	West Fork - Wells 230kV	-365
Champagne - Plaisance (CLECO) 138kV	Vatican - Scott1 138kV	-365
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-347
Fancy Point - Port Hudson 230kV ckt 1	Fancy Point - Port Hudson 230kV ckt 2	-71
Champagne - Plaisance (CLECO) 138kV	Colfax (CLECO) - Rodemacher 230kV	11
Fancy Point - Port Hudson 230kV ckt 2	Fancy Point - Port Hudson 230kV ckt 1	25
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	66
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	66
Champagne - Plaisance (CLECO) 138kV	Colfax (CLECO) - Montgomery 230kV	96
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	116
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	118
Port Hudson 230/138 transformer 2	Port Hudson 230/138 transformer 1	127
Terrebone - Coteau 115kV	Raceland - Coteau 115kV	144
Port Hudson 230/138 transformer 1	Port Hudson 230/138 transformer 2	150
Greenwood - Terrebone 115kV	Bayou Sales (CLECO) - Teche 138kV (CLECO)	158

## OKGE

Limiting Element	Contingency Element	ATC
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-372
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-30
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	55
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	55
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series	96



Limiting Element	Contingency Element	ATC
	Compensation	
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	97
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	234
Plantation - Cedar Hill 138kV	Oak Ridge - Porter 138kV	351
Cleveland - Jacinto 138kV	Jacinto - Peach Creek 230kV	424

## SMEPA

Limiting Element	Contingency Element	ATC
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Duke Hinds-1 - Lakeover 230kV	-10244
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams - Pickens 230kV	-9679
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton - Pickens 230kV	-9092
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Laurel East (SOCO) - Hatisburg Southwest (SOCO) 230kV	-8971
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams 500/230kV transformer 2	-8966
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Baxter Wilson 500/115kV transformer 1	-8963
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams 500/230kV transformer 1	-8913
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Lakeover 500/115kV transformer	-8912
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Attala - McAdams 230kV	-8890
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Attala 230/115kV transformer	-8890
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Base Case	-8646
Ray Braswell - West Jackson 115kV	South Jackson 230/115kV transformer 1	-695
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-278
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	62
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	62
Jackson Miami - Rex Brown-W 115kV	South Jackson 230/115kV transformer 1	95
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	109
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	111
Florence - South Jackson 115kV - Supplemental Upgrade	Bogalusa - Franklin 500kV	233
Florence - South Jackson 115kV - Supplemental Upgrade	Bogalusa - Adams Creek 500/230kV transformer	233
South Jackson - West Jackson 115kV	South Jackson 230/115kV transformer 1	305
Florence - South Jackson 115kV - Supplemental Upgrade	South Jackson - Poplar Spring 115kV	345

Limiting Element	Contingency Element	ATC
Florence - South Jackson 115kV - Supplemental Upgrade	Angie - Adams Creek 230kV	363
Florence - South Jackson 115kV - Supplemental Upgrade	Georgetown - Poplar Spring 115kV	368
Florence - South Jackson 115kV - Supplemental Upgrade	Georgetown - Silver Creek 115kV	374
Florence - South Jackson 115kV - Supplemental Upgrade	Angie (SOCO) - Hattisburg SW (SOCO) 230kV	379
Florence - South Jackson 115kV - Supplemental Upgrade	CHATOM (PS) - EWAYNE (SMEPA) 230kV	381
Florence - South Jackson 115kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	385
Jackson Miami - Jackson Monument Street 115kV	South Jackson 230/115kV transformer 1	390
Florence - South Jackson 115kV - Supplemental Upgrade	Sturgis MS (TVA) - NW Louisville (TVA) 161kV	392

### SOCO

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-515
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	60
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	60
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	105
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	107

### SPA

Limiting Element	Contingency Element	ATC
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-475
Lake Conway - Mayflower 115kV	Pleasant Hill 500/161kV transformer	-210
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-39
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	57
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	57
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	99
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	101
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	240
Conway West 161/115kV transformer	Pleasant Hill 500/161kV transformer	288

### TVA

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV -	Franklin - Grand Gulf 500kV	-842

<b>Limiting Element</b>	<b>Contingency Element</b>	<b>ATC</b>
Supplemental Upgrade		
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	59
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	59
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	104
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	106
Winfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	281

## APPENDIX C: Details of Scenario 2 – 2017

### AECI

Limiting Element	Contingency Element	ATC
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-2094
West Memphis 500/161kV transformer	Birmingham Steel (TVA) - West Memphis EHV 500kV	-1822
West Memphis 500/161kV transformer	Freeport TN (TVA) - Birmingham Steel (TVA) 500kV	-1611
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-1227
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-208
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-73
North Crowley - Scott1 138kV	Richard - Wells 500kV	90
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	347
Cleveland - Tarking 138kV	Porter - New Caney 138kV	425

### AEPW

Limiting Element	Contingency Element	ATC
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-2076
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-383
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-83

### AMRN

Limiting Element	Contingency Element	ATC
West Memphis 500/161kV transformer	Birmingham Steel (TVA) - West Memphis EHV 500kV	- 1755
West Memphis 500/161kV transformer	Freeport TN (TVA) - Birmingham Steel (TVA) 500kV	- 1551
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	- 1298
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	- 1075
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-218
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-71
North Crowley - Scott1 138kV	Richard - Wells 500kV	88
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	345
Cleveland - Tarking 138kV	Porter - New Caney 138kV	422

### CLECO

Limiting Element	Contingency Element	ATC
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-55
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	332
Cleveland - Tarking 138kV	Porter - New Caney 138kV	393

**EAI**

Limiting Element	Contingency Element	ATC
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-78
North Crowley - Scott1 138kV	Richard - Wells 500kV	97
Eldorado EHV 500/115kV transformer	McNeil 500/115kV transformer	316
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	345
Cleveland - Tarking 138kV	Porter - New Caney 138kV	422

**EESSLoad**

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-10055
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-4421
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-770
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-73
North Crowley - Scott1 138kV	Richard - Wells 500kV	87
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	278
Cleveland - Tarking 138kV	Porter - New Caney 138kV	377

**EES**

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-10289
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-81
Cleveland - Tarking 138kV	Porter - New Caney 138kV	387

**EMDE**

Limiting Element	Contingency Element	ATC
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-1260
Pleasant Hill 500/161kV transformer	ANO 500/161kV transformer	-497
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-225
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-75
North Crowley - Scott1 138kV	Richard - Wells 500kV	93
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	350

**EMI**

Limiting Element	Contingency Element	ATC
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Duke Hinds-1 - Lakeover 230kV	-8879
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams - Pickens 230kV	-8712
Ray Braswell 500/230kV transformer ckt2 -	Canton - Pickens 230kV	-8639

Limiting Element	Contingency Element	ATC
Supplemental Upgrade		
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Bogalusa - Franklin 500kV	-8387
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Bogalusa - Adams Creek 500/230kV transformer	-8387
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton South - Canton 230kV	-8360
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Northside - Rex Brown 230kV	-8320
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Webre - Wells 500kV	-8277
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Northside - Ray Braswell 230kV	-8156
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Vicksburg - Waterways 115kV	-8126
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Base Case	-7449
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-4366
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-1419
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-708
Eldorado EHV 500/115kV transformer	Eldorado EHV - Sterlington 500kV	-78
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-63
North Crowley - Scott1 138kV	Richard - Wells 500kV	76
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	337
Cleveland - Tarking 138kV	Porter - New Caney 138kV	410

#### LAF A

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-8111
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-274
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-151
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-113
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-41
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	21
North Crowley - Scott1 138kV	Richard - Wells 500kV	32
Semere - Scott2 138kV	Richard - Wells 500kV	66
North Crowley - Scott1 138kV	Richard - Scott1 138kV	73
Semere - Scott2 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	100
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	102
Champagne - Plaisance (CLECO) 138kV	West Fork - Wells 230kV	111
Semere - Scott2 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	137

## LAGN

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-5846
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-3687
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-2183
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-58
North Crowley - Scott1 138kV	Richard - Wells 500kV	92
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	325
Cleveland - Tarking 138kV	Porter - New Caney 138kV	394

## LEPA

Limiting Element	Contingency Element	ATC
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-8897
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-4222
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-2702
Vatican - Scott1 138kV	Coughlin (CLECO) - Plaisance 138kV (CLECO)	-1918
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-1415
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-386
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-191
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-160
Champagne - Plaisance (CLECO) 138kV	Vatican - Scott1 138kV	-56
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-47
Vacherie - Waterford 230kV	Raceland - Waterford 230kV	7
Greenwood - Terrebone 115kV	Bayou Sales (CLECO) - Teche 138kV (CLECO)	14
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	27
Terrebone - Coteau 115kV	Raceland - Coteau 115kV	29

## OKGE

Limiting Element	Contingency Element	ATC
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-1359
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-249
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-77
North Crowley - Scott1 138kV	Richard - Wells 500kV	96

## SMEPA

Limiting Element	Contingency Element	ATC
Ray Braswell 500/230kV transformer ckt2 -	Duke Hinds-1 - Lakeover 230kV	-9919

Limiting Element	Contingency Element	ATC
Supplemental Upgrade		
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams - Pickens 230kV	-9102
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Baxter Wilson 500/115kV transformer 1	-8748
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Laurel East (SOCO) - Hatisburg Southwest (SOCO) 230kV	-8646
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Ray Braswell 500/115kV transformer 1	-8606
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams 500/230kV transformer 2	-8590
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Attala - McAdams 230kV	-8553
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Attala 230/115kV transformer	-8553
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Coly - McKnight 500kV	-8547
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams 500/230kV transformer 1	-8546
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Base Case	-8321
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-3393
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-3297
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-1186
Ray Braswell - West Jackson 115kV	South Jackson 230/115kV transformer 1	-1044
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-534
Jackson Miami - Rex Brown-W 115kV	South Jackson 230/115kV transformer 1	-152
Florence - South Jackson 115kV - Supplemental Upgrade	Bogalusa - Adams Creek 500/230kV transformer	-71
Florence - South Jackson 115kV - Supplemental Upgrade	Bogalusa - Franklin 500kV	-71
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-58
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Nelson - Richard 500kV + WRCT	-48
South Jackson - West Jackson 115kV	South Jackson 230/115kV transformer 1	-44
Florence - South Jackson 115kV - Supplemental Upgrade	South Jackson - Poplar Spring 115kV	68
North Crowley - Scott1 138kV	Richard - Wells 500kV	69
Florence - South Jackson 115kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	72
Florence - South Jackson 115kV - Supplemental Upgrade	McAdams - Wolf Creek 500kV	76
Florence - South Jackson 115kV - Supplemental Upgrade	French Camp (TVA) - Choctaw (TVA) 500kV	76
Florence - South Jackson 115kV - Supplemental Upgrade	Choctaw MS (TVA) - Clay (TVA) 500kV	77
Florence - South Jackson 115kV - Supplemental Upgrade	Georgetown - Poplar Spring 115kV	90
Florence - South Jackson 115kV - Supplemental Upgrade	Angie - Adams Creek 230kV	94



Limiting Element	Contingency Element	ATC
Florence - South Jackson 115kV - Supplemental Upgrade	Georgetown - Silver Creek 115kV	96
North Crowley - Scott1 138kV	Richard - Wells 500kV and Wells Reactor	139
Jackson Miami - Jackson Monument Street 115kV	South Jackson 230/115kV transformer 1	143
Florence - South Jackson 115kV - Supplemental Upgrade	Base Case	235
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	335
Cleveland - Tarking 138kV	Porter - New Caney 138kV	407

### SOCO

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-6286
West Memphis 500/161kV transformer	Birmingham Steel (TVA) - West Memphis EHV 500kV	-2115
West Memphis 500/161kV transformer	Freeport TN (TVA) - Birmingham Steel (TVA) 500kV	-1870
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-1764
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-724
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-288
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-64
North Crowley - Scott1 138kV	Richard - Wells 500kV	78
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	340
Cleveland - Tarking 138kV	Porter - New Caney 138kV	414

### SPA

Limiting Element	Contingency Element	ATC
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-1147
Lake Conway - Mayflower 115kV	Pleasant Hill 500/161kV transformer	-866
Conway West 161/115kV transformer	Pleasant Hill 500/161kV transformer	-368
Pleasant Hill 500/161kV transformer	ANO 500/161kV transformer	-226
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-207
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-75
North Crowley - Scott1 138kV	Richard - Wells 500kV	93
Conway West - Lake Conway 115kV	Pleasant Hill 500/161kV transformer	97
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	349

### TVA

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-10288
West Memphis 500/161kV transformer	Birmingham Steel (TVA) - West Memphis EHV 500kV	-1744
West Memphis 500/161kV transformer	Freeport TN (TVA) - Birmingham Steel (TVA) 500kV	-1541
Mabelvale - Sheridan 500kV	Keo - White Bluff 500kV	-1443

<b>Limiting Element</b>	<b>Contingency Element</b>	<b>ATC</b>
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-579
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-235
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-68
North Crowley - Scott1 138kV	Richard - Wells 500kV	83
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	342
Cleveland - Tarking 138kV	Porter - New Caney 138kV	417

## APPENDIX D: Details of Scenario 3 – 2017

### AECI

Limiting Element	Contingency Element	ATC
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-502
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-21
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	56
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	56
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	99
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	101
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	290

### AEPW

Limiting Element	Contingency Element	ATC
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-242
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-10
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	50
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	50
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	88
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	89
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	259
Plantation - Cedar Hill 138kV	Oak Ridge - Porter 138kV	261
Cleveland - Jacinto 138kV	Jacinto - Peach Creek 230kV	410

### AMRN

Limiting Element	Contingency Element	ATC
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	57
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	57
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	100
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	102
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	301

## CLECO

Limiting Element	Contingency Element	ATC
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	62
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	62
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	109
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	111

## EAI

Limiting Element	Contingency Element	ATC
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	57
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	57
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	101
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	103
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	258

## EESLoad

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-497
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	51
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	51
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	90
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	92
Cleveland - Jacinto 138kV	Jacinto - Peach Creek 230kV	409

## EES

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-480
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	61
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	61
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	108
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	110

**EMDE**

<b>Limiting Element</b>	<b>Contingency Element</b>	<b>ATC</b>
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-423
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-18
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	55
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	55
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	97
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	99
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	280

**EMI**

<b>Limiting Element</b>	<b>Contingency Element</b>	<b>ATC</b>
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams - Pickens 230kV	-9662
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton - Pickens 230kV	-9609
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Duke Hinds-1 - Lakeover 230kV	-9576
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton South - Canton 230kV	-9316
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Bogalusa - Adams Creek 500/230kV transformer	-8998
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Bogalusa - Franklin 500kV	-8998
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton - Yandell Road 230kV	-8907
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Ray Braswell 500/115kV transformer 1	-8793
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Nelson - Richard 500kV + WRCT	-8793
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Roy S. Nelson - Richard 500kV	-8743
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Base Case	-8072
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	60
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	60
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	106
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	108

**Lafa**

Limiting Element	Contingency Element	ATC
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-995
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-980
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-819
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-816
Champagne - Plaisance (CLECO) 138kV	West Fork - Wells 230kV	-724
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-587
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-527
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-425
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-376
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-348
Coughlin (CLECO) - Plaisance 138kV (CLECO)	West Fork - Wells 230kV	-257
Champagne - Plaisance (CLECO) 138kV	Colfax (CLECO) - Rodemacher 230kV	10
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	67
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	67
Champagne - Plaisance (CLECO) 138kV	Colfax (CLECO) - Montgomery 230kV	107
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	119
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	121

**LAGN**

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-280
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	67
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	67
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	118
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	120

**LEPA**

Limiting Element	Contingency Element	ATC
Vatican - Scott1 138kV	Coughlin (CLECO) - Plaisance 138kV (CLECO)	-1655

Limiting Element	Contingency Element	ATC
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-1301
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-1137
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-1087
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-932
Champagne - Plaisance (CLECO) 138kV	West Fork - Wells 230kV	-828
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-779
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-603
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-565
Champagne - Plaisance (CLECO) 138kV	Vatican - Scott1 138kV	-406
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-398
Coughlin (CLECO) - Plaisance 138kV (CLECO)	West Fork - Wells 230kV	-293
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-202
Fancy Point - Port Hudson 230kV ckt 1	Fancy Point - Port Hudson 230kV ckt 2	-20
Champagne - Plaisance (CLECO) 138kV	Colfax (CLECO) - Rodemacher 230kV	8
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	64
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	64
Fancy Point - Port Hudson 230kV ckt 2	Fancy Point - Port Hudson 230kV ckt 1	78
Champagne - Plaisance (CLECO) 138kV	Colfax (CLECO) - Montgomery 230kV	91
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	114
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	116
Port Hudson 230/138 transformer 2	Port Hudson 230/138 transformer 1	148
Terrebone - Coteau 115kV	Raceland - Coteau 115kV	149
Greenwood - Terrebone 115kV	Bayou Sales (CLECO) - Teche 138kV (CLECO)	158

#### OKGE

Limiting Element	Contingency Element	ATC
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-357
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-15
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	53
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	53
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	95

Limiting Element	Contingency Element	ATC
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	96
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	271
Plantation - Cedar Hill 138kV	Oak Ridge - Porter 138kV	346
Cleveland - Jacinto 138kV	Jacinto - Peach Creek 230kV	424

## SMEPA

Limiting Element	Contingency Element	ATC
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Duke Hinds-1 - Lakeover 230kV	-10182
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams - Pickens 230kV	-9605
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Canton - Pickens 230kV	-9040
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Laurel East (SOCO) - Hatisburg Southwest (SOCO) 230kV	-8901
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams 500/230kV transformer 2	-8895
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Lakeover 500/115kV transformer	-8860
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams 500/230kV transformer 1	-8843
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Ray Braswell 500/115kV transformer 1	-8816
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Attala - McAdams 230kV	-8805
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Base Case	-8583
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-163
Jacinto - Splendora 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	61
Jacinto - Splendora 138kV	China - China/Porter 230kV Series Compensation	61
Jacinto - Splendora 138kV	Porter - China/Porter 230kV Series Compensation	108
Jacinto - Splendora 138kV	Porter 230/138/13.8kV 3 Winding Transformer	110
Florence - South Jackson 115kV - Supplemental Upgrade	Bogalusa - Franklin 500kV	218
Florence - South Jackson 115kV - Supplemental Upgrade	Bogalusa - Adams Creek 500/230kV transformer	218
Ray Braswell 500/115kV transformer 1	Ray Braswell 500/230kV transformer ckt1 and ckt2 Test Contingency	245
Florence - South Jackson 115kV - Supplemental Upgrade	South Jackson - Poplar Spring 115kV	329
Florence - South Jackson 115kV - Supplemental Upgrade	Angie - Adams Creek 230kV	349
Florence - South Jackson 115kV - Supplemental Upgrade	Georgetown - Poplar Spring 115kV	352
Florence - South Jackson 115kV - Supplemental Upgrade	Georgetown - Silver Creek 115kV	357
Florence - South Jackson 115kV - Supplemental Upgrade	Angie (SOCO) - Hattisburg SW (SOCO)	365



Limiting Element	Contingency Element	ATC
Supplemental Upgrade	230kV	
Florence - South Jackson 115kV - Supplemental Upgrade	CHATOM (PS) - EWAYNE (SMEPA) 230kV	366
Florence - South Jackson 115kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	368
Jackson Miami - Rex Brown-W 115kV	South Jackson 230/115kV transformer 1	375
Florence - South Jackson 115kV - Supplemental Upgrade	Sturgis MS (TVA) - NW Louisville (TVA) 161kV	376
South Jackson - West Jackson 115kV	South Jackson 230/115kV transformer 1	421

### SOCO

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-302
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	59
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	59
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	104
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	106
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-302

### SPA

Limiting Element	Contingency Element	ATC
International Paper - Mansfield 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-457
International Paper - Wallake 138kV (CLECO)	Dolet Hills (CLECO) - S.W. Shreevport 345kV (CLECO)	-19
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	55
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	55
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	98
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	100
Quitman - Hamlet 161kV	Greenbrier - Pleasant Hill 161kV	234
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	278

### TVA

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-497
Jacinto - Splendor 138kV	China/Porter - China/Porter 230kV Series Compensation ckt 2	58
Jacinto - Splendor 138kV	China - China/Porter 230kV Series Compensation	58

<b>Limiting Element</b>	<b>Contingency Element</b>	<b>ATC</b>
Jacinto - Splendor 138kV	Porter - China/Porter 230kV Series Compensation	103
Jacinto - Splendor 138kV	Porter 230/138/13.8kV 3 Winding Transformer	105
Winnfield 230/115kV transformer	Clarence (CLECO) - Montgomery 230kV	327

## APPENDIX E: Details of Scenario 4 – 2017

### AECI

Limiting Element	Contingency Element	ATC
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-2001
West Memphis 500/161kV transformer	Birmingham Steel (TVA) - West Memphis EHV 500kV	-1802
West Memphis 500/161kV transformer	Freeport TN (TVA) - Birmingham Steel (TVA) 500kV	-1591
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-214
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-111
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	348

### AEPW

Limiting Element	Contingency Element	ATC
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-393
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-126

### AMRN

Limiting Element	Contingency Element	ATC
West Memphis 500/161kV transformer	Birmingham Steel (TVA) - West Memphis EHV 500kV	-1735
West Memphis 500/161kV transformer	Freeport TN (TVA) - Birmingham Steel (TVA) 500kV	-1531
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-1027
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-225
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-109
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	347

### CLECO

Limiting Element	Contingency Element	ATC
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-84
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	333
Cleveland - Tarking 138kV	Porter - New Caney 138kV	398

### EAI

Limiting Element	Contingency Element	ATC
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-119
Eldorado EHV 500/115kV transformer	McNeil 500/115kV transformer	334
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	346

## EESLoad

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-9986
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-797
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-111
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	279
Cleveland - Tarking 138kV	Porter - New Caney 138kV	381

## EES

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-10016
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-123
Cleveland - Tarking 138kV	Porter - New Caney 138kV	390

## EMDE

Limiting Element	Contingency Element	ATC
Quitman - Hamlet 161kV	Greenbrier - Pleasant Hill 161kV	-458
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-231
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-114
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	351
Quitman - Hamlet 161kV	Greenbrier - Quitman 161kV	415

## EMI

Limiting Element	Contingency Element	ATC
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-1359
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-736
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-96
Eldorado EHV 500/115kV transformer	Eldorado EHV - Sterlington 500kV	-65
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	338
Cleveland - Tarking 138kV	Porter - New Caney 138kV	414

## LAFa

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-7558
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-267
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-107
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-103

Limiting Element	Contingency Element	ATC
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-60
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	74
Coughlin (CLECO) - Plaisance 138kV (CLECO)	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	118

#### LAGN

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-5634
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-3516
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-2261
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-224
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-89
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	156
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	326
Champagne - Plaisance (CLECO) 138kV	West Fork - Wells 230kV	351
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Lake Charles Bulk - Roy S Nelson 138kV ckt 2	374
Cleveland - Tarking 138kV	Porter - New Caney 138kV	398

#### LEPA

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-4055
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-2571
Vatican - Scott1 138kV	Coughlin (CLECO) - Plaisance 138kV (CLECO)	-2098
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-1461
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-368
Champagne - Plaisance (CLECO) 138kV	Vatican - Scott1 138kV	-180
Champagne - Plaisance (CLECO) 138kV	Vil Plat (CLECO) - West Fork (CLECO) 230kV	-143
Champagne - Plaisance (CLECO) 138kV	Cocodrie (CLECO) - Vil Plat (CLECO) 230kV	-127
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-71
Vacherie - Waterford 230kV	Raceland - Waterford 230kV	-34
Greenwood - Terrebone 115kV	Bayou Sales (CLECO) - Teche 138kV (CLECO)	14

#### OKGE

Limiting Element	Contingency Element	ATC
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-256
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-118

**SMEPA**

<b>Limiting Element</b>	<b>Contingency Element</b>	<b>ATC</b>
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Duke Hinds-1 - Lakeover 230kV	-9836
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams - Pickens 230kV	-9006
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Laurel East (SOCO) - Hatisburg Southwest (SOCO) 230kV	-8554
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Ray Braswell 500/115kV transformer 1	-8538
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams 500/230kV transformer 2	-8499
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Coly - McKnight 500kV	-8460
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	McAdams 500/230kV transformer 1	-8455
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Sterlington 500/115kV transformer 2	-8448
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Attala - McAdams 230kV	-8448
Ray Braswell 500/230kV transformer ckt2 - Supplemental Upgrade	Base Case	-8237
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-3276
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-1131
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-552
Florence - South Jackson 115kV - Supplemental Upgrade	Bogalusa - Adams Creek 500/230kV transformer	-89
Florence - South Jackson 115kV - Supplemental Upgrade	Bogalusa - Franklin 500kV	-89
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-88
Florence - South Jackson 115kV - Supplemental Upgrade	South Jackson - Poplar Spring 115kV	49
Florence - South Jackson 115kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	53
Florence - South Jackson 115kV - Supplemental Upgrade	McAdams - Wolf Creek 500kV	58
Florence - South Jackson 115kV - Supplemental Upgrade	French Camp (TVA) - Choctaw (TVA) 500kV	58
Florence - South Jackson 115kV - Supplemental Upgrade	Choctaw MS (TVA) - Clay (TVA) 500kV	58
Florence - South Jackson 115kV - Supplemental Upgrade	Georgetown - Poplar Spring 115kV	72
South Jackson - West Jackson 115kV	South Jackson 230/115kV transformer 1	75
Florence - South Jackson 115kV - Supplemental Upgrade	Georgetown - Silver Creek 115kV	78
Florence - South Jackson 115kV - Supplemental Upgrade	Angie - Adams Creek 230kV	78
Jackson Miami - Rex Brown-W 115kV	South Jackson 230/115kV transformer 1	133
Florence - South Jackson 115kV - Supplemental Upgrade	Base Case	216

Limiting Element	Contingency Element	ATC
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	336
Cleveland - Tarking 138kV	Porter - New Caney 138kV	411
Roy S. Nelson 500/230kV transformer	Hartburg - Roy S. Nelson 500kV	414

### SOCO

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-6085
West Memphis 500/161kV transformer	Birmingham Steel (TVA) - West Memphis EHV 500kV	-2088
West Memphis 500/161kV transformer	Freeport TN (TVA) - Birmingham Steel (TVA) 500kV	-1842
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-691
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-298
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-98
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	341
Cleveland - Tarking 138kV	Porter - New Caney 138kV	418

### SPA

Limiting Element	Contingency Element	ATC
Quitman - Hamlet 161kV	Greenbrier - Pleasant Hill 161kV	-248
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-211
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-114
Quitman - Hamlet 161kV	Greenbrier - Quitman 161kV	225
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	350

### TVA

Limiting Element	Contingency Element	ATC
Ray Braswell - Baxter Wilson 500kV - Supplemental Upgrade	Franklin - Grand Gulf 500kV	-10010
West Memphis 500/161kV transformer	Birmingham Steel (TVA) - West Memphis EHV 500kV	-1721
West Memphis 500/161kV transformer	Freeport TN (TVA) - Birmingham Steel (TVA) 500kV	-1518
Keo - West Memphis EHV 500kV	Sansouci - Shelby TN (TVA) 500kV	-552
Keo - White Bluff 500kV	Mabelvale - Sheridan 500kV	-243
Lake Charles Bulk - Roy S Nelson 138kV ckt 1	Roy S. Nelson - Richard 500kV	-104
Caney Creek - Lewis Creek SES 138kV	Alden - Lewis Creek SES 138kV	343
Cleveland - Tarking 138kV	Porter - New Caney 138kV	421