



SPP *Southwest Power Pool*

Feasibility Study for PID 223 125 MW Wind Generation Green Forest S. to Harrison W. 161kV

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I. Introduction

This Energy Resource Interconnection Service (ERIS) is based on Generation Interconnection request PID-223 request for interconnection on Entergy's transmission system between Green Forest South and Harrison West 161kV substations located approximately 3.3 miles from Green Forest South 161kV substation. The objective of this study is to assess the reliability impact of the new facility on the Entergy transmission system with respect to the steady state and transient stability performance of the 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 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 Report is based on information provided by Generation Interconnection request PID-223 and assumptions made by 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.

II. Load Flow Analysis

A. Model Information

The load flow analysis was performed based on the projected 2011 and 2015 summer peak load flow model. 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 2011 and 2015 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 proposed 125MW wind generation and the 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 requesting generator as the source and adjacent control area as sink. (Note: Refer to NRIS [Section – B] for details of dispatch within Entergy system)

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

Prior transmission service requests that were included in this study:

OASIS #	PSE	MW	Begin	End
1460900	Louisiana Energy & Power Authority	116	1/1/2009	1/1/2030
1478781	Entergy Services, Inc. (EMO)	804	1/1/2008	1/1/2058
1481059	Constellation Energy Group	60	2/1/2011	2/1/2030
1481111	City of Conway	50	2/1/2011	2/1/2046
1481119	Constellation Energy Group	30	2/1/2011	2/1/2030
1481235	Louisiana Energy & Power Authority	50	2/1/2011	2/1/2016
1481438	NRG Power Marketing	20	2/1/2011	2/1/2021
1483241	NRG Power Marketing	103	1/1/2010	1/1/2020
1483243	NRG Power Marketing	206	1/1/2010	1/1/2020
1483244	NRG Power Marketing	309	1/1/2010	1/1/2020

OASIS #	PSE	MW	Begin	End
1520043	Municipal Energy Agency of Miss	20	1/1/2011	1/1/2026
ASA-2008-001	TVA	724	1/1/2009	1/1/2011
ASA-2008-003	Empire District Electric Co.	100	11/1/2008	11/1/2028
1551562	CLECO Power LLC	11	6/1/2009	6/1/2018
1552146	Entergy Services (EMO)	1	1/1/2009	1/1/2014
1552148	Entergy Services (EMO)	1	1/1/2009	1/1/2014
1555717	East Texas Electric Coop	1	1/1/2010	1/1/2015
1555718	Entergy Services (EMO)	158	1/1/2010	1/1/2015
1557602	East Texas Electric Coop	1	1/1/2009	1/1/2017
1558905	NRG Power Marketing	250	7/1/2009	7/1/2014
1558911	NRG Power Marketing	100	1/1/2009	1/1/2014
1559579	NRG Power Marketing	500	5/1/2010	5/1/2015
1559580	NRG Power Marketing	500	5/1/2010	5/1/2015
1559581	NRG Power Marketing	150	5/1/2010	5/1/2015
1562340	Entergy Services (EMO)	1	7/1/2008	7/1/2009
1562529	Constellation Energy Grp	123	1/1/2009	1/1/2010
1563290				
1563291	Muni Energy Agcy of Miss	40	6/1/2013	6/1/2043
1563814	NRG Power Marketing	125	1/1/2011	1/1/2021
1564020	Constellation Energy Grp	123	1/1/2009	1/1/2010

Prior generator interconnection requests that were included for this study:

PID	Substation	MW	In Service Date
208	Fancy Point	1594	1/1/2015
210	Lewis Creek	358	6/1/2010
211	Lewis Creek	570	6/1/2011

The generator step-up transformers, generators, and interconnecting lines were modeled according to the information provided by Generation Interconnection request PID-223. Details of Scenario 1 are presented in **Appendix A-A**. Details of Scenario 2 are presented in **Appendix A-B**. Details of Scenario 3 are presented in **Appendix A-C**. And, details of Scenario 4 are presented in **Appendix A-D**.

B. Load Flow Analyses

i) Load Flow Analysis:

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.

ii) 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 Rate A.

iii) Power Factor Consideration / Criteria

Entergy, consistent with the FERC Large Generator Interconnection Procedures (LGIP) requires the customer to be capable of supplying at least 0.33 MVAR (*i.e.*, 0.95 lagging power factor) and absorbing at least 0.33 MVAR (*i.e.*, 0.95 leading power factor) for every MW of power injected into the grid. In the event that, under normal operating conditions, the customer facility does not meet the prescribed power factor requirements at the point of interconnection, the customer shall take necessary steps, such as the installation of reactive power compensating devices, to achieve the desired power factor.

C. Analysis Results

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

Table II-C Summary of Results for PID-223 – ERIS Load Flow Study

Interface		2011 FCITC Available for Scenario 1	2015 FCITC Available for Scenario 1	2015 FCITC Available for Scenario 2	2011 FCITC Available for Scenario 3	2015 FCITC Available for Scenario 3	2015 FCITC Available for Scenario 4
AECI	Associated Electric Cooperative, Inc.	125	125	125	125	125	125
AMRN	Ameren Transmission	125	125	125	100	100	125
AEP-W	American Electric Power - West	0	125	0	0	125	0
CLEC	CLECO	0	0	0	0	0	0
EES	Entergy	0	0	0	0	0	0
EMDE	Empire District Electric Co	125	125	125	125	125	125
LAF	Lafayette Utilities Sustum	0	0	0	0	0	0
LAGN	Louisiana Generating, LLC	125	125	125	125	125	0
LEPA	Louisiana Energy & Power Authority	0	0	0	0	0	0
OKGE	Oklahoma Gas & Electric Company	0	0	0	0	0	0
SMEPA	South Mississippi Electric Power Assoc.	0	0	0	0	0	0
SOCO	Southern Company	125	125	125	125	125	125
SPA	Southwest Power Administration	125	0	0	125	0	0
TVA	Tennessee Valley Authority	125	125	125	125	125	125

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

TABLE II-C-1 DETAILS OF SCENARIO 1 RESULTS: (WITHOUT FUTURE PROJECTS AND WITHOUT PENDING TRANSMISSION SERVICE & STUDY REQUEST)

2011 Summer Peak Limiting Element	Cost (\$)	Interface													
		AECI	AEPW	AMRN	CLECO	EES	EMDE	LAFa	LAGN	LEPA	OKGE	SMEPA	SOCO	SWPA	TVA
Acadia - Colonial Academy 138kV	2,092,500							X							
Acadia GSU - Scanlan 138kV	485,000							X							
Addis - Willow Glen 138kV	9,585,000				X			X		X					
Bonin - Cecelia 138kV	4,792,000									X					
Champagne - East Opelousas 138kV	TBD							X							
Champagne - Krotz Spring 138kV	29,239,000				X			X							
Chauvin - Ashland 115kV	4,606,875									X					
Colonial Academy - Richard 138kV	2,652,500							X							
Danville - North Magazine REA 161kV	10,530,000										X				
Fairview - Gypsy 230kV	34,728,000											X			
Gibson - Humphrey 115kV	24,009,000				X			X							
Gibson - Ramos 138kV	TBD				X			X							
Gibson 138/115kV transformer	6,010,000				X			X							
Greenwood - Humphrey 115kV	3,838,000				X			X							
Greenwood - Terrebone 115kV	22,094,000				X			X							
Habetz - Richard 138kV	3,272,500							X		X					
Judice - Meaux 138kV	TBD									X					
Judice - Scott1 138kV	10,000,000									X					
Krotz Spring - Line 642 Tap 138kV	136,701				X			X							
Livonia - Line 642 Tap 138kV	TBD				X			X							
Livonia - Wilbert 138kV	41,123,000				X			X							
'MANSFLD4 138' TO BUS 'IPAPER 4 138'	TBD	X													
Moril - Cecelia 138kV	TBD									X					
North Crowley - Richard 138kV	3,776,625							X							
North Crowley - Scott1 138kV	4,265,000				X			X							
Raceland - Coteau 115kV	3,065,000									X					
Richard - Scott1 138kV	9,531,000							X		X					
Scott1 - Bonin 138kV	1,755,000							X							
Semere - Scott2 138kV	5,477,625							X							
Sterlington 500/115kV transformer 1	19,401,000						X								
Sterlington 500/115kV transformer 2	19,401,000						X								

2015 Summer Peak	Interface														
Limiting Element	Cost (\$)	AECI	AEPW	AMRN	CLECO	EES	EMDE	Lafa	LAGN	LEPA	OKGE	SMEPA	SOCO	SWPA	TVA
Addis - Wilbert 138kV	TBD							X							
Addis - Willow Glen 138kV	9,585,000				X			X		X					
Champagne - East Opelousas 138kV	TBD							X							
Champagne - Krotz Spring 138kV	29,239,000				X			X							
Chauvin - Ashland 115kV	4,606,875									X					
Colonial Academy - Richard 138kV	2,652,500							X							
Danville - North Magazine REA 161kV	10,530,000										X				
Fairview - Gypsy 230kV	34,728,000											X			
French Settlement - Sorrento 230kV	3,345,300											X			
Gibson - Humphrey 115kV	24,009,000				X			X							
Gibson - Ramos 138kV	TBD				X			X							
Gibson 138/115kV transformer	6,010,000				X			X							
Greenwood - Humphrey 115kV	3,838,000				X			X							
Greenwood - Terrebone 115kV	22,094,000				X			X							
Hartburg - Inland Orange 230kV	2,985,000					X									
Jonesboro - Jonesboro North (AECC) 161kV	10,575,000													X	
Judice - Scott1 138kV	10,000,000				X										
Krotz Spring - Line 642 Tap 138kV	136,701				X			X							
Livonia - Line 642 Tap 138kV	TBD				X			X							
Livonia - Wilbert 138kV	41,123,000				X			X							
North Crowley - Scott1 138kV	4,265,000							X							
Raceland - Coteau 115kV	3,065,000									X					
Richard - Scott1 138kV	9,531,000							X							
Scott1 - Bonin 138kV	1,755,000							X							
Semere - Scott2 138kV	5,477,625							X							
Sterlington 500/115kV transformer 1	19,401,000					X									
Sterlington 500/115kV transformer 2	19,401,000					X									

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

2015 Summer Peak	Interface														
Limiting Element	Cost (\$)	AECI	AEPW	AMRN	CLECO	EES	EMDE	LAFa	LAGN	LEPA	OKGE	SMEPA	SOCO	SWPA	TVA
A.A.C. - Licar 230kV	4,02,500									X		X			
A.A.C. - Polsky Carville 230kV	3,750,000									X		X			
Acadia - Colonial Academy 138kV	2,092,500							X							
Acadia GSU - Scanlan 138kV	485,000							X							
Addis - Big Cajun 1 230kV	37,175,000									X					
Belle Helene - Licar 230kV	3,187,500									X		X			
Belle Helene - Woodstock 230kV	1,775,000									X		X			
Chauvin - Ashland 115kV	4,606,875									X					
Colonial Academy - Richard 138kV	2,652,500				X			X							
Coly - Vignes 230kV	13,350,000									X					
Danville - North Magazine REA 161kV	10,530,000										X				
Fairview - Gypsy 230kV	34,728,000											X			
French Settlement - Sorrento 230kV	3,345,300											X			
Habetz - Richard 138kV	3,272,500				X			X							
Jonesboro - Jonesboro North (AECC) 161kV	10,575,000													X	
Judice - Meaux 138kV	TBD				X										
Judice - Scott1 138kV	10,000,000				X										
'MANSFLD4 138' TO BUS 'IPAPER 4 138'	TBD		X												
North Crowley - Richard 138kV	3,776,625							X							
North Crowley - Scott1 138kV	4,265,000				X			X							
Richard - Scott1 138kV	9,531,000				X			X							
Scott1 - Bonin 138kV	1,755,000							X							
Semere - Scott2 138kV	5,477,625				X			X							
Sorrento - Vignes 230kV	8,120,000									X					
Sterlington 500/115kV transformer 1	19,401,000					X									
Sterlington 500/115kV transformer 2	19,401,000					X									
Vulchlor - Woodstock 230kV	950,000									X		X			

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

2011 Summer Peak Limiting Element	Cost (\$)	Interface													
		AECI	AEPW	AMRN	CLECO	EES	EMDE	Lafa	LAGN	LEPA	OKGE	SMEPA	SOCO	SWPA	TVA
Acadia - Colonial Academy 138kV	2,092,500							X							
Acadia GSU - Scanlan 138kV	485,000							X							
Addis - Willow Glen 138kV	9,585,000				X			X		X					
Bonin - Cecelia 138kV	4,792,500									X					
Champagne - East Opelousas 138kV	TBD							X							
Champagne - Krotz Spring 138kV	29,239,000				X			X							
Chauvin - Ashland 115kV	4,606,875									X					
Colonial Academy - Richard 138kV	2,652,500							X							
Danville - North Magazine REA 161kV	10,530,000										X				
Fairview - Gypsy 230kV	34,728,000											X			
Gibson - Humphrey 115kV	24,009,000				X			X							
Gibson - Ramos 138kV	TBD				X			X							
Gibson 138/115kV transformer	TBD				X			X							
Greenwood - Humphrey 115kV	3,838,000				X			X							
Greenwood - Terrebone 115kV	22,094,000				X			X							
Habetz - Richard 138kV	3,272,500							X		X					
Judice - Meaux 138kV	TBD									X					
Judice - Scott1 138kV	10,000,000									X					
Krotz Spring - Line 642 Tap 138kV	45,000				X			X							
Livonia - Line 642 Tap 138kV	27,728,000				X			X							
Livonia - Wilbert 138kV	41,123,000				X			X							
'MANSFLD4 138' TO BUS 'IPAPER 4 138'	TBD		X												
Moril - Cecelia 138kV	TBD									X					
North Crowley - Richard 138kV	3,776,625							X							
North Crowley - Scott1 138kV	4,265,000							X							
Raceland - Coteau 115kV	3,065,000									X					
Richard - Scott1 138kV	9,531,000							X		X					
Scott1 - Bonin 138kV	1,755,000							X							
Semere - Scott2 138kV	5,477,625							X							
Sterlington 500/115kV transformer 1	19,401,000						X								
Sterlington 500/115kV transformer 2	19,401,000						X								

2015 Summer Peak	Interface														
Limiting Element	Cost (\$)	AECI	AEPW	AMRN	CLECO	EES	EMDE	Lafa	LAGN	LEPA	OKGE	SMEPA	SOCO	SWPA	TVA
A.A.C. - Licar 230kV	4,062,500											X			
A.A.C. - Polsky Carville 230kV	3,750,000											X			
Addis - Wilbert 138kV	TBD							X							
Addis - Willow Glen 138kV	9,585,000				X			X		X					
Belle Helene - Licar 230kV	3,187,500											X			
Champagne - East Opelousas 138kV	TBD							X							
Champagne - Krotz Spring 138kV	29,239,000				X			X							
Chauvin - Ashland 115kV	4,606,875									X					
Colonial Academy - Richard 138kV	2,652,500							X							
Danville - North Magazine REA 161kV	10,530,000										X				
Fairview - Gypsy 230kV	34,728,000											X			
French Settlement - Sorrento 230kV	3,345,000											X			
Gibson - Humphrey 115kV	24,009,000				X			X							
Gibson - Ramos 138kV	TBD				X			X							
Gibson 138/115kV transformer	TBD							X							
Greenwood - Humphrey 115kV	3,838,000				X			X							
Greenwood - Terrebone 115kV	22,094,000				X			X							
Hartburg - Inland Orange 230kV	2,985,000					X									
Jonesboro - Jonesboro North (AECC) 161kV	10,575,000													X	
Judice - Scott1 138kV	10,000,000				X										
Krotz Spring - Line 642 Tap 138kV	45,000				X			X							
Livonia - Line 642 Tap 138kV	27,728,000				X			X							
Livonia - Wilbert 138kV	41,123,000				X			X							
North Crowley - Scott1 138kV	4,265,000							X							
Raceland - Coteau 115kV	3,065,000							X							
Richard - Scott1 138kV	9,531,000							X							
Scott1 - Bonin 138kV	1,755,000							X							
Semere - Scott2 138kV	5,477,625							X							
Sterlington 500/115kV transformer 1	19,401,000					X									
Sterlington 500/115kV transformer 2	19,401,000					X									

TABLE II-C-4 DETAILS OF SCENARIO 4 RESULTS: (WITH FUTURE PROJECTS AND WITH PENDING TRANSMISSION SERVICE & STUDY REQUEST)

2015 Summer Peak	Interface														
Limiting Element	Cost (\$)	AECI	AEPW	AMRN	CLECO	EES	EMDE	LAFa	LAGN	LEPA	OKGE	SMEPA	SOCO	SWPA	TVA
A.A.C. - Licar 230kV	4,062,500									X		X			
A.A.C. - Polsky Carville 230kV	3,750,000									X		X			
Acadia - Colonial Academy 138kV	2,092,500							X							
Acadia GSU - Scanlan 138kV	485,000							X							
Addis - Big Cajun 1 230kV	31,175,000									X					
Belle Helene - Licar 230kV	3,187,500									X		X			
Belle Helene - Woodstock 230kV	1,775,000									X		X			
Chauvin - Ashland 115kV	4,606,875									X					
Chauvin - Valentine 115kV	TBD									X					
Colonial Academy - Richard 138kV	2,652,500							X							
Danville - North Magazine REA 161kV	10,530,000										X				
Fairview - Gypsy 230kV	34,728,000											X			
French Settlement - Sorrento 230kV	3,345,300											X			
Habetz - Richard 138kV	3,272,500				X			X							
Jonesboro - Jonesboro North (AECC) 161kV	10,575,000													X	
Judice - Meaux 138kV	TBD				X										
Judice - Scott1 138kV	10,000,000				X										
'MANSFLD4 138' TO BUS 'IPAPER 4 138'	TBD		1												
North Crowley - Richard 138kV	3,776,625							X							
North Crowley - Scott1 138kV	4,265,000				X			X							
Raceland - Coteau 115kV	3,065,000									X					
Richard - Scott1 138kV	9,531,000				X			X							
Scott1 - Bonin 138kV	1,755,000							X							
Semere - Scott2 138kV	5,477,625				X			X							
Sorrento - Vignes 230kV	8,120,000									X					

2015 Summer Peak	Interface														
Limiting Element	Cost (\$)	AECI	AEPW	AMRN	CLECO	EES	EMDE	Lafa	LAGN	LEPA	OKGE	SMEPA	SOCO	SWPA	TVA
Sterlington 500/115kV transformer 1	19,401,000					X									
Sterlington 500/115kV transformer 2	19,401,000					X									
Vulchlor - Woodstock 230kV	950,000									X		X			

III. Short Circuit Analysis / Breaker Rating Analysis

A. 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.

B. Short Circuit Analysis

The method used to determine if any short circuit problems would be caused by the addition of the PID-223 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-223 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-223 generation. Any breakers identified to be upgraded through this comparison are mandatory upgrades.

C. Analysis Results

There were no breakers that were found to be under-rated as a result of the additional short circuit current due to PID-223 generator.

APPENDIX A-A: DETAILS OF SCENARIO 1

AECI 2011

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

AEP-W 2011

Limiting Element	Contingency Element	ATC
'MANSFLD4 138' TO BUS 'IPAPER 4 138'	Contingency of FlowGate 5029 DOLHILL7 345 TO SW SHV 7 345	0

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

AMRN 2011

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

CLECO 2011

Limiting Element	Contingency Element	ATC
Greenwood - Terrebone 115kV	Webre - Wells 500kV	0
Greenwood - Humphrey 115kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Richard - Wells 500kV	0

Gibson - Humphrey 115kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Bonin - Labbe 230kV (LAFA)	0
Livonia - Wilbert 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Point Des Mouton - Wells 230kV	0
Greenwood - Terrebone 115kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Gibson - Ramos 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Livonia - Line 642 Tap 138kV	Webre - Wells 500kV	0
Champagne - Krotz Spring 138kV	Webre - Wells 500kV	104
North Crowley - Scott1 138kV	Wells 500/230kV transformer	144

CLECO 2015

Limiting Element	Contingency Element	ATC
Livonia - Wilbert 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Webre - Wells 500kV	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Livonia - Line 642 Tap 138kV	Webre - Wells 500kV	0
Krotz Spring - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Humphrey 115kV	Webre - Wells 500kV	0
Gibson - Humphrey 115kV	Webre - Wells 500kV	0
Champagne - Krotz Spring 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Richard - Wells 500kV	0
Judice - Scott1 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Livonia - Wilbert 138kV	Richard - Wells 500kV	0
Judice - Scott1 138kV	Greenwood - Terrebone 115kV	0
Gibson - Ramos 138kV	Webre - Wells 500kV	0
Judice - Scott1 138kV	Greenwood - Humphrey 115kV	0
Judice - Scott1 138kV	Gibson - Humphrey 115kV	0
Judice - Scott1 138kV	Gibson 138/115kV transformer	84
Judice - Scott1 138kV	Gibson - Ramos 138kV	84
Gibson 138/115kV transformer	Webre - Wells 500kV	121

EES 2011

Limiting Element	Contingency Element	ATC
Sterlington 500/115kV transformer 2	Sterlington 500/115kV transformer 1	0
Sterlington 500/115kV transformer 1	Sterlington 500/115kV transformer 2	0

2015

Limiting Element	Contingency Element	ATC
Sterlington 500/115kV transformer 2	Sterlington 500/115kV transformer 1	0
Sterlington 500/115kV transformer 1	Sterlington 500/115kV transformer 2	0
Hartburg - Inland Orange 230kV	Cypress - Hartburg 500kV	0

EMDE 2011

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

LAFa 2011

Limiting Element	Contingency Element	ATC
Greenwood - Terrebone 115kV	Webre - Wells 500kV	0
Semere - Scott2 138kV	Bonin - Labbe 230kV (LAFa)	0
Greenwood - Humphrey 115kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Richard - Wells 500kV	0
Gibson - Humphrey 115kV	Webre - Wells 500kV	0
Livonia - Wilbert 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Bonin - Labbe 230kV (LAFa)	0
North Crowley - Scott1 138kV	Bonin - Labbe 230kV (LAFa)	0
Greenwood - Terrebone 115kV	Flander - Hopkins 138kV (CLECO/LAFa)	0
Colonial Academy - Richard 138kV	Bonin - Labbe 230kV (LAFa)	0
Semere - Scott2 138kV	Point Des Mouton - Wells 230kV	0
Semere - Scott2 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	0
Gibson - Ramos 138kV	Webre - Wells 500kV	0
Semere - Scott2 138kV	Bonin - Cecelia 138kV	0
Livonia - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Point Des Mouton - Wells 230kV	0
Krotz Spring - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	0
Greenwood - Humphrey 115kV	Richard - Wells 500kV	0
North Crowley - Scott1 138kV	Point Des Mouton - Wells 230kV	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
North Crowley - Scott1 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	0
Acadia - Colonial Academy 138kV	Bonin - Labbe 230kV (LAFa)	0
Semere - Scott2 138kV	Greenwood - Terrebone 115kV	0
Scott1 - Bonin 138kV	Bonin - Labbe 230kV (LAFa)	0
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFa)	0
Colonial Academy - Richard 138kV	Point Des Mouton - Wells 230kV	0
Gibson - Humphrey 115kV	Richard - Wells 500kV	0
Habetz - Richard 138kV	Bonin - Labbe 230kV (LAFa)	0
Colonial Academy - Richard 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	0
North Crowley - Scott1 138kV	Richard - Scott1 138kV	0

Gibson 138/115kV transformer	Webre - Wells 500kV	0
Acadia GSU - Scanlan 138kV	Bonin - Labbe 230kV (LAFA)	0
Acadia - Colonial Academy 138kV	Point Des Mouton - Wells 230kV	0
Scott1 - Bonin 138kV	Point Des Mouton - Wells 230kV	0
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	9
Champagne - East Opelousas 138kV	Webre - Wells 500kV	10
Scott1 - Bonin 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	27
Acadia - Colonial Academy 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	28
Habetz - Richard 138kV	Point Des Mouton - Wells 230kV	35
Richard - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	37
North Crowley - Scott1 138kV	Wells 500/230kV transformer	41
Acadia GSU - Scanlan 138kV	Point Des Mouton - Wells 230kV	56
North Crowley - Richard 138kV	Bonin - Labbe 230kV (LAFA)	64
Habetz - Richard 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	65
Champagne - Krotz Spring 138kV	Webre - Wells 500kV	71
Acadia GSU - Scanlan 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	85
North Crowley - Richard 138kV	Point Des Mouton - Wells 230kV	99

2015

Limiting Element	Contingency Element	ATC
Greenwood - Terrebone 115kV	Webre - Wells 500kV	0
Livonia - Wilbert 138kV	Webre - Wells 500kV	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Livonia - Line 642 Tap 138kV	Webre - Wells 500kV	0
Krotz Spring - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Humphrey 115kV	Webre - Wells 500kV	0
Gibson - Humphrey 115kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Richard - Wells 500kV	0
Champagne - Krotz Spring 138kV	Webre - Wells 500kV	0
Semere - Scott2 138kV	Bonin - Labbe 230kV (LAFA)	0
Livonia - Wilbert 138kV	Richard - Wells 500kV	0
North Crowley - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
Champagne - East Opelousas 138kV	Webre - Wells 500kV	0
Gibson - Ramos 138kV	Webre - Wells 500kV	0
Semere - Scott2 138kV	Point Des Mouton - Wells 230kV	0
Semere - Scott2 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
North Crowley - Scott1 138kV	Point Des Mouton - Wells 230kV	0
North Crowley - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Colonial Academy - Richard 138kV	Bonin - Labbe 230kV (LAFA)	8
Scott1 - Bonin 138kV	Bonin - Labbe 230kV (LAFA)	50
Colonial Academy - Richard 138kV	Point Des Mouton - Wells 230kV	64
Scott1 - Bonin 138kV	Point Des Mouton - Wells 230kV	87
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	87
Colonial Academy - Richard 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	99
Gibson 138/115kV transformer	Webre - Wells 500kV	101
Addis - Wilbert 138kV	Webre - Wells 500kV	105
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	110

Limiting Element	Contingency Element	ATC
Scott1 - Bonin 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	120
North Crowley - Scott1 138kV	Richard - Scott1 138kV	120
Greenwood - Humphrey 115kV	Richard - Wells 500kV	121

LAGN 2011

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

LEPA 2011

Limiting Element	Contingency Element	ATC
Judice - Scott1 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
Judice - Meaux 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Habetz - Richard 138kV	Bonin - Labbe 230kV (LAFA)	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Judice - Scott1 138kV	Moril - Cecelia 138kV	0
Moril - Cecelia 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	59
Raceland - Coteau 115kV	Terrebone 230/115kV transformer	63
Addis - Willow Glen 138kV	Louisiana Station - Wilbert 138kV	95
Chauvin - Ashland 115kV	Coteau - Houma 115kV	100
Bonin - Cecelia 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	103

2015

Limiting Element	Contingency Element	ATC
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Addis - Willow Glen 138kV	Louisiana Station - Wilbert 138kV	26
Chauvin - Ashland 115kV	Coteau - Houma 115kV	91
Raceland - Coteau 115kV	Terrebone 230/115kV transformer	118

**OKGE
2010**

Limiting Element	Contingency Element	ATC
Danville - North Magazine REA 161kV	ANO - Fort Smith 500kV	0

2015

Limiting Element	Contingency Element	ATC
Danville - North Magazine REA 161kV	ANO - Fort Smith 500kV	0

**SMEPA
2011**

Limiting Element	Contingency Element	ATC
Fairview - Gypsy 230kV	French Settlement - Sorrento 230kV	0

**SMEPA
2015**

Limiting Element	Contingency Element	ATC
Fairview - Gypsy 230kV	French Settlement - Sorrento 230kV	0
Fairview - Gypsy 230kV	Front Street - Slidell 230kV	0
Fairview - Gypsy 230kV	French Settlement - Springfield 230kV	0
French Settlement - Sorrento 230kV	Fairview - Gypsy 230kV	0
French Settlement - Sorrento 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
French Settlement - Sorrento 230kV	Bogalusa - Franklin 500kV	0

**SOCO
2011**

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

**SWPA
2011**

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
Jonesboro - Jonesboro North (AECC) 161kV	Heber Springs South - Quitman 161 kV	0
Jonesboro - Jonesboro North (AECC) 161kV	Heber Springs South - Heber Industrial 161kV	39

**TVA
2011**

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

APPENDIX A-B: DETAILS OF SCENARIO 2

2015

AECI

Limiting Element	Contingency Element	ATC
NONE	NONE	125

AEP-W

Limiting Element	Contingency Element	ATC
'MANSFLD4 138' TO BUS 'IPAPER 4 138'	Contingency of FlowGate 5029 DOLHILL7 345 TO SW SHV 7 345	0

AMRN

Limiting Element	Contingency Element	ATC
NONE	NONE	125

CLECO

Limiting Element	Contingency Element	ATC
North Crowley - Scott1 138kV	Richard - Scott1 138kV	0
Judice - Scott1 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
Semere - Scott2 138kV	North Crowley - Richard 138kV	0
Semere - Scott2 138kV	Habetz - Richard 138kV	0
Richard - Scott1 138kV	North Crowley - Richard 138kV	0
North Crowley - Scott1 138kV	Habetz - Richard 138kV	0
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	0
Judice - Scott1 138kV	Greenwood - Terrebone 115kV	0
Judice - Scott1 138kV	Greenwood - Terrebone 115kV	0
Semere - Scott2 138kV	Greenwood - Terrebone 115kV	0
Semere - Scott2 138kV	Greenwood - Terrebone 115kV	0
Judice - Scott1 138kV	Greenwood - Terrebone 115kV	0
Judice - Scott1 138kV	Greenwood - Terrebone 115kV	0
Semere - Scott2 138kV	Wells 500/230kV transformer	0
North Crowley - Scott1 138kV	Wells 500/230kV transformer	0
North Crowley - Scott1 138kV	Livonia - Wilbert 138kV	0
Richard - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Habetz - Richard 138kV	Bonin - Labbe 230kV (LAFA)	0
Semere - Scott2 138kV	Livonia - Wilbert 138kV	0
Judice - Scott1 138kV	Moril - Cecelia 138kV	0
North Crowley - Scott1 138kV	Greenwood - Terrebone 115kV	0
North Crowley - Scott1 138kV	Greenwood - Terrebone 115kV	0
Colonial Academy - Richard 138kV	Habetz - Richard 138kV	0
Colonial Academy - Richard 138kV	North Crowley - Richard 138kV	0
Judice - Scott1 138kV	Greenwood - Humphrey 115kV	0
Judice - Scott1 138kV	Gibson - Humphrey 115kV	0
North Crowley - Scott1 138kV	Franklin - McKnight 500kV	0
Richard - Scott1 138kV	North Crowley - Richard 138kV	0
Judice - Meaux 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Richard - Scott1 138kV	Habetz - Richard 138kV	70
Judice - Scott1 138kV	Gibson - Ramos 138kV	71
Judice - Scott1 138kV	Gibson 138/115kV transformer	71
North Crowley - Scott1 138kV	Roy S. Nelson - Richard 500kV	74
North Crowley - Scott1 138kV	Hartburg - Roy S. Nelson 500kV	84

EES

Limiting Element	Contingency Element	ATC
Sterlington 500/115kV transformer 2	Sterlington 500/115kV transformer 1	0
Sterlington 500/115kV transformer 1	Sterlington 500/115kV transformer 2	0

EMDE

Limiting Element	Contingency Element	ATC
NONE	NONE	125

LAFa

Limiting Element	Contingency Element	ATC
Semere - Scott2 138kV	Bonin - Labbe 230kV (LAFa)	0
North Crowley - Scott1 138kV	Bonin - Labbe 230kV (LAFa)	0
Colonial Academy - Richard 138kV	Bonin - Labbe 230kV (LAFa)	0
Semere - Scott2 138kV	Point Des Mouton - Wells 230kV	0
North Crowley - Scott1 138kV	Richard - Scott1 138kV	0
Semere - Scott2 138kV	Bonin - Cecelia 138kV	0
Semere - Scott2 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	0
North Crowley - Scott1 138kV	Point Des Mouton - Wells 230kV	0
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFa)	0
North Crowley - Scott1 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	0
Acadia - Colonial Academy 138kV	Bonin - Labbe 230kV (LAFa)	0
Semere - Scott2 138kV	Richard - Scott1 138kV	0
Colonial Academy - Richard 138kV	Point Des Mouton - Wells 230kV	0
Semere - Scott2 138kV	Wells 500/230kV transformer	0
North Crowley - Richard 138kV	Bonin - Labbe 230kV (LAFa)	0
North Crowley - Scott1 138kV	Wells 500/230kV transformer	0
Colonial Academy - Richard 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	0
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	0
Habetz - Richard 138kV	Bonin - Labbe 230kV (LAFa)	0
Acadia GSU - Scanlan 138kV	Bonin - Labbe 230kV (LAFa)	0
Richard - Scott1 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	0
North Crowley - Scott1 138kV	Colonial Academy - Richard 138kV	0
Acadia - Colonial Academy 138kV	Point Des Mouton - Wells 230kV	0
Richard - Scott1 138kV	North Crowley - Richard 138kV	0
North Crowley - Richard 138kV	Point Des Mouton - Wells 230kV	1
Acadia - Colonial Academy 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	8
Acadia GSU - Scanlan 138kV	Point Des Mouton - Wells 230kV	28
Habetz - Richard 138kV	Point Des Mouton - Wells 230kV	29
North Crowley - Richard 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	34
Scott1 - Bonin 138kV	Bonin - Labbe 230kV (LAFa)	37
Richard - Scott1 138kV	North Crowley - Scott1 138kV	46
North Crowley - Richard 138kV	Richard - Scott1 138kV	56
Acadia GSU - Scanlan 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	62
Habetz - Richard 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	67
Scott1 - Bonin 138kV	Point Des Mouton - Wells 230kV	79
Colonial Academy - Richard 138kV	Wells 500/230kV transformer	102
Scott1 - Bonin 138kV	Point Des Mouton (LAFa) - Labbe (LAFa) 230kV	112
North Crowley - Richard 138kV	Habetz - Richard 138kV	116

LAGN

Limiting Element	Contingency Element	ATC
NONE	NONE	125

LEPA

Limiting Element	Contingency Element	ATC
Coly - Vignes 230kV	A.A.C. - Polsky Carville 230kV	0
Coly - Vignes 230kV	A.A.C. - Licar 230kV	0
Coly - Vignes 230kV	Belle Helene - Licar 230kV	0
Coly - Vignes 230kV	Belle Helene - Woodstock 230kV	0
Coly - Vignes 230kV	Vulchlor - Woodstock 230kV	0
A.A.C. - Polsky Carville 230kV	Waterford - Willow Glen 500kV	0
A.A.C. - Polsky Carville 230kV	Waterford 500/230 transformer kV	0
Sorrento - Vignes 230kV	A.A.C. - Polsky Carville 230kV	0
A.A.C. - Licar 230kV	Waterford - Willow Glen 500kV	0
A.A.C. - Licar 230kV	Waterford 500/230 transformer kV	0
Sorrento - Vignes 230kV	A.A.C. - Licar 230kV	0
Sorrento - Vignes 230kV	Belle Helene - Licar 230kV	0
Belle Helene - Licar 230kV	Waterford - Willow Glen 500kV	0
Belle Helene - Licar 230kV	Waterford 500/230 transformer kV	0
Sorrento - Vignes 230kV	Belle Helene - Woodstock 230kV	0
Sorrento - Vignes 230kV	Vulchlor - Woodstock 230kV	0
Coly - Vignes 230kV	Conway - Vulchlor 230kV	0
Belle Helene - Woodstock 230kV	Waterford - Willow Glen 500kV	0
Belle Helene - Woodstock 230kV	Waterford 500/230 transformer kV	0
Vulchlor - Woodstock 230kV	Waterford - Willow Glen 500kV	0
Vulchlor - Woodstock 230kV	Waterford 500/230 transformer kV	0
Addis - Big Cajun 1 230kV	Big Cajun 2 - Webre 500kV	0
Sorrento - Vignes 230kV	Conway - Vulchlor 230kV	0
Chauvin - Ashland 115kV	Coteau - Houma 115kV	0
Addis - Big Cajun 1 230kV	Enjay - Fancy 230kV	15
Chauvin - Valentine 115kV	Coteau - Houma 115kV	115
Raceland - Coteau 115kV	Terrebone 230/115kV transformer	116
Coteau - Houma 115kV	Chauvin - Valentine 115kV	135

OKGE

Limiting Element	Contingency Element	ATC
Danville - North Magazine REA 161kV	ANO - Fort Smith 500kV	0

SMEPA

Limiting Element	Contingency Element	ATC
A.A.C. - Polsky Carville 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
A.A.C. - Polsky Carville 230kV	Bogalusa - Franklin 500kV	0
A.A.C. - Licar 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
A.A.C. - Licar 230kV	Bogalusa - Franklin 500kV	0
Belle Helene - Licar 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
Belle Helene - Licar 230kV	Bogalusa - Franklin 500kV	0
French Settlement - Sorrento 230kV	Fairview - Gypsy 230kV	0
French Settlement - Sorrento 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
French Settlement - Sorrento 230kV	Bogalusa - Franklin 500kV	0
Fairview - Gypsy 230kV	French Settlement - Sorrento 230kV	0
Belle Helene - Woodstock 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
Belle Helene - Woodstock 230kV	Bogalusa - Franklin 500kV	0
Vulchlor - Woodstock 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
Vulchlor - Woodstock 230kV	Bogalusa - Franklin 500kV	0
French Settlement - Sorrento 230kV	Front Street - Slidell 230kV	0
Fairview - Gypsy 230kV	French Settlement - Springfield 230kV	0
Fairview - Gypsy 230kV	Bogalusa - Adams Creek 500/230kV transformer	0

SOCO

Limiting Element	Contingency Element	ATC
NONE	NONE	125

SWPA

Limiting Element	Contingency Element	ATC
Jonesboro - Jonesboro North (AECC) 161kV	Heber Springs South - Quitman 161 kV	0
Jonesboro - Jonesboro North (AECC) 161kV	Heber Springs South - Heber Industrial 161kV	70

TVA

Limiting Element	Contingency Element	ATC
NONE	NONE	125

APPENDIX A-D: DETAILS OF SCENARIO 3

AECI 2011

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

AEP-W 2011

Limiting Element	Contingency Element	ATC
'MANSFLD4 138' TO BUS 'IPAPER 4 138'	Contingency of FlowGate 5029 DOLHILL7 345 TO SW SHV 7 345	0

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

AMRN 2011

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

CLECO 2011

Limiting Element	Contingency Element	ATC
Greenwood - Terrebone 115kV	Webre - Wells 500kV	0
Greenwood - Humphrey 115kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Richard - Wells 500kV	0
Gibson - Humphrey 115kV	Webre - Wells 500kV	0
Livonia - Wilbert 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Bonin - Labbe 230kV (LAFA)	0
Greenwood - Terrebone 115kV	Point Des Mouton - Wells 230kV	0
Greenwood - Terrebone 115kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Gibson - Ramos 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Livonia - Line 642 Tap 138kV	Webre - Wells 500kV	0
Krotz Spring - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Humphrey 115kV	Richard - Wells 500kV	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Gibson - Humphrey 115kV	Richard - Wells 500kV	0
Gibson 138/115kV transformer	Webre - Wells 500kV	0
Champagne - Krotz Spring 138kV	Webre - Wells 500kV	95

2015

Limiting Element	Contingency Element	ATC
Livonia - Wilbert 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Webre - Wells 500kV	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Livonia - Line 642 Tap 138kV	Webre - Wells 500kV	0
Krotz Spring - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Humphrey 115kV	Webre - Wells 500kV	0
Gibson - Humphrey 115kV	Webre - Wells 500kV	0
Champagne - Krotz Spring 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Richard - Wells 500kV	0
Judice - Scott1 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Livonia - Wilbert 138kV	Richard - Wells 500kV	0
Judice - Scott1 138kV	Greenwood - Terrebone 115kV	0
Gibson - Ramos 138kV	Webre - Wells 500kV	0
Judice - Scott1 138kV	Greenwood - Humphrey 115kV	0
Judice - Scott1 138kV	Gibson - Humphrey 115kV	0
Judice - Scott1 138kV	Gibson 138/115kV transformer	84
Judice - Scott1 138kV	Gibson - Ramos 138kV	84
Gibson 138/115kV transformer	Webre - Wells 500kV	124

**EES
2011**

Limiting Element	Contingency Element	ATC
Sterlington 500/115kV transformer 2	Sterlington 500/115kV transformer 1	0
Sterlington 500/115kV transformer 1	Sterlington 500/115kV transformer 2	0

2015

Limiting Element	Contingency Element	ATC
Sterlington 500/115kV transformer 2	Sterlington 500/115kV transformer 1	0
Sterlington 500/115kV transformer 1	Sterlington 500/115kV transformer 2	0
Hartburg - Inland Orange 230kV	Cypress - Hartburg 500kV	0

**EMDE
2011**

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

**Lafa
2011**

Limiting Element	Contingency Element	ATC
Greenwood - Terrebone 115kV	Webre - Wells 500kV	0
Semere - Scott2 138kV	Bonin - Labbe 230kV (Lafa)	0
Greenwood - Humphrey 115kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Richard - Wells 500kV	0
Gibson - Humphrey 115kV	Webre - Wells 500kV	0
Livonia - Wilbert 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Bonin - Labbe 230kV (Lafa)	0
North Crowley - Scott1 138kV	Bonin - Labbe 230kV (Lafa)	0
Colonial Academy - Richard 138kV	Bonin - Labbe 230kV (Lafa)	0
Semere - Scott2 138kV	Point Des Mouton - Wells 230kV	0
Greenwood - Terrebone 115kV	Flander - Hopkins 138kV (CLECO/Lafa)	0
Semere - Scott2 138kV	Point Des Mouton (Lafa) - Labbe (Lafa) 230kV	0
Semere - Scott2 138kV	Bonin - Cecelia 138kV	0
Gibson - Ramos 138kV	Webre - Wells 500kV	0

Limiting Element	Contingency Element	ATC
Livonia - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Point Des Mouton - Wells 230kV	0
Krotz Spring - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Greenwood - Humphrey 115kV	Richard - Wells 500kV	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
North Crowley - Scott1 138kV	Point Des Mouton - Wells 230kV	0
North Crowley - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Acadia - Colonial Academy 138kV	Bonin - Labbe 230kV (LAFA)	0
Semere - Scott2 138kV	Greenwood - Terrebone 115kV	0
Scott1 - Bonin 138kV	Bonin - Labbe 230kV (LAFA)	0
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
Colonial Academy - Richard 138kV	Point Des Mouton - Wells 230kV	0
Gibson - Humphrey 115kV	Richard - Wells 500kV	0
Habetz - Richard 138kV	Bonin - Labbe 230kV (LAFA)	0
Colonial Academy - Richard 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
North Crowley - Scott1 138kV	Richard - Scott1 138kV	0
Acadia GSU - Scanlan 138kV	Bonin - Labbe 230kV (LAFA)	0
Gibson 138/115kV transformer	Webre - Wells 500kV	0
Acadia - Colonial Academy 138kV	Point Des Mouton - Wells 230kV	0
Scott1 - Bonin 138kV	Point Des Mouton - Wells 230kV	0
Champagne - East Opelousas 138kV	Webre - Wells 500kV	6
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	9
Scott1 - Bonin 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	27
Acadia - Colonial Academy 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	27
Habetz - Richard 138kV	Point Des Mouton - Wells 230kV	34
Richard - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	37
North Crowley - Scott1 138kV	Wells 500/230kV transformer	41
Acadia GSU - Scanlan 138kV	Point Des Mouton - Wells 230kV	55
North Crowley - Richard 138kV	Bonin - Labbe 230kV (LAFA)	63
Habetz - Richard 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	65
Champagne - Krotz Spring 138kV	Webre - Wells 500kV	65
Acadia GSU - Scanlan 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	84
North Crowley - Richard 138kV	Point Des Mouton - Wells 230kV	98

2015

Limiting Element	Contingency Element	ATC
Greenwood - Terrebone 115kV	Webre - Wells 500kV	0
Livonia - Wilbert 138kV	Webre - Wells 500kV	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Livonia - Line 642 Tap 138kV	Webre - Wells 500kV	0
Krotz Spring - Line 642 Tap 138kV	Webre - Wells 500kV	0
Greenwood - Humphrey 115kV	Webre - Wells 500kV	0
Gibson - Humphrey 115kV	Webre - Wells 500kV	0
Greenwood - Terrebone 115kV	Richard - Wells 500kV	0
Champagne - Krotz Spring 138kV	Webre - Wells 500kV	0

Semere - Scott2 138kV	Bonin - Labbe 230kV (LAFA)	0
Livonia - Wilbert 138kV	Richard - Wells 500kV	0
North Crowley - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
Champagne - East Opelousas 138kV	Webre - Wells 500kV	0
Gibson - Ramos 138kV	Webre - Wells 500kV	0
Semere - Scott2 138kV	Point Des Mouton - Wells 230kV	0
Semere - Scott2 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
North Crowley - Scott1 138kV	Point Des Mouton - Wells 230kV	0
North Crowley - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Colonial Academy - Richard 138kV	Bonin - Labbe 230kV (LAFA)	7
Scott1 - Bonin 138kV	Bonin - Labbe 230kV (LAFA)	50
Colonial Academy - Richard 138kV	Point Des Mouton - Wells 230kV	64
Scott1 - Bonin 138kV	Point Des Mouton - Wells 230kV	87
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	87
Colonial Academy - Richard 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	98
Addis - Wilbert 138kV	Webre - Wells 500kV	100
Gibson 138/115kV transformer	Webre - Wells 500kV	104
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	110
Addis - Willow Glen 138kV	Louisiana Station - Wilbert 138kV	119
Scott1 - Bonin 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	119
North Crowley - Scott1 138kV	Richard - Scott1 138kV	121

LAGN 2011

Limiting Element	Contingency Element	ATC
NONE	NONE	125

LAGN 2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

LEPA 2011

Limiting Element	Contingency Element	ATC
Judice - Scott1 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
Judice - Meaux 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Habetz - Richard 138kV	Bonin - Labbe 230kV (LAFA)	0
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Judice - Scott1 138kV	Moril - Cecelia 138kV	0

Moril - Cecelia 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	58
Raceland - Coteau 115kV	Terrebone 230/115kV transformer	64
Addis - Willow Glen 138kV	Louisiana Station - Wilbert 138kV	91
Bonin - Cecelia 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	95
Chauvin - Ashland 115kV	Coteau - Houma 115kV	100

2015

Limiting Element	Contingency Element	ATC
Addis - Willow Glen 138kV	Webre - Wells 500kV	0
Addis - Willow Glen 138kV	Louisiana Station - Wilbert 138kV	24
Chauvin - Ashland 115kV	Coteau - Houma 115kV	91
Raceland - Coteau 115kV	Terrebone 230/115kV transformer	119

OKGE

2011

Limiting Element	Contingency Element	ATC
Danville - North Magazine REA 161kV	ANO - Fort Smith 500kV	0

2015

Limiting Element	Contingency Element	ATC
Danville - North Magazine REA 161kV	ANO - Fort Smith 500kV	0

**SMEPA
2011**

Limiting Element	Contingency Element	ATC
Fairview - Gypsy 230kV	French Settlement - Sorrento 230kV	0

2015

Limiting Element	Contingency Element	ATC
Fairview - Gypsy 230kV	French Settlement - Sorrento 230kV	0
French Settlement - Sorrento 230kV	Fairview - Gypsy 230kV	0
A.A.C. - Polsky Carville 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
A.A.C. - Polsky Carville 230kV	Bogalusa - Franklin 500kV	0
Fairview - Gypsy 230kV	Front Street - Slidell 230kV	0
Fairview - Gypsy 230kV	French Settlement - Springfield 230kV	0
A.A.C. - Licar 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
A.A.C. - Licar 230kV	Bogalusa - Franklin 500kV	0
French Settlement - Sorrento 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
French Settlement - Sorrento 230kV	Bogalusa - Franklin 500kV	0
Belle Helene - Licar 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
Belle Helene - Licar 230kV	Bogalusa - Franklin 500kV	0

**SOCO
2011**

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

**SWPA
2011**

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
Jonesboro - Jonesboro North (AECC) 161kV	Heber Springs South - Quitman 161 kV	0
Jonesboro - Jonesboro North (AECC) 161kV	Heber Springs South - Heber Industrial 161kV	38

TVA

2010

Limiting Element	Contingency Element	ATC
NONE	NONE	125

2015

Limiting Element	Contingency Element	ATC
NONE	NONE	125

APPENDIX A-D: DETAILS OF SCENARIO 4

2015

AECI

Limiting Element	Contingency Element	ATC
NONE	NONE	125

AEP-W

Limiting Element	Contingency Element	ATC
'MANSFLD4 138' TO BUS 'IPAPER 4 138'	Contingency of FlowGate 5029 DOLHILL7 345 TO SW SHV 7 345	0

AMRN

Limiting Element	Contingency Element	ATC
NONE	NONE	125

CLECO

Limiting Element	Contingency Element	ATC
North Crowley - Scott1 138kV	Richard - Scott1 138kV	0
Judice - Scott1 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	0
Judice - Scott1 138kV	Greenwood - Terrebone 115kV	0
Semere - Scott2 138kV	Wells 500/230kV transformer	0
North Crowley - Scott1 138kV	Wells 500/230kV transformer	0
Richard - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Habetz - Richard 138kV	Bonin - Labbe 230kV (LAFA)	0
Judice - Scott1 138kV	Moril - Cecelia 138kV	0
Judice - Scott1 138kV	Greenwood - Humphrey 115kV	0
Judice - Scott1 138kV	Gibson - Humphrey 115kV	0
Richard - Scott1 138kV	North Crowley - Richard 138kV	0
Judice - Meaux 138kV	Flander - Hopkins 138kV (CLECO/LAFA)	0
Judice - Scott1 138kV	Gibson 138/115kV transformer	67
Judice - Scott1 138kV	Gibson - Ramos 138kV	67

EES

Limiting Element	Contingency Element	ATC
Sterlington 500/115kV transformer 2	Sterlington 500/115kV transformer 1	0
Sterlington 500/115kV transformer 1	Sterlington 500/115kV transformer 2	0

EMDE

Limiting Element	Contingency Element	ATC
NONE	NONE	125

LAGN

Limiting Element	Contingency Element	ATC
NONE	NONE	125

LAFA

Limiting Element	Contingency Element	ATC
Semere - Scott2 138kV	Bonin - Labbe 230kV (LAFA)	0
North Crowley - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
Colonial Academy - Richard 138kV	Bonin - Labbe 230kV (LAFA)	0
Semere - Scott2 138kV	Point Des Mouton - Wells 230kV	0
North Crowley - Scott1 138kV	Richard - Scott1 138kV	0
Semere - Scott2 138kV	Bonin - Cecelia 138kV	0
Semere - Scott2 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
North Crowley - Scott1 138kV	Point Des Mouton - Wells 230kV	0
Richard - Scott1 138kV	Bonin - Labbe 230kV (LAFA)	0
North Crowley - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
Acadia - Colonial Academy 138kV	Bonin - Labbe 230kV (LAFA)	0
Semere - Scott2 138kV	Richard - Scott1 138kV	0
Colonial Academy - Richard 138kV	Point Des Mouton - Wells 230kV	0
Semere - Scott2 138kV	Wells 500/230kV transformer	0
North Crowley - Richard 138kV	Bonin - Labbe 230kV (LAFA)	0
Colonial Academy - Richard 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
North Crowley - Scott1 138kV	Wells 500/230kV transformer	0
Richard - Scott1 138kV	Point Des Mouton - Wells 230kV	0
Habetz - Richard 138kV	Bonin - Labbe 230kV (LAFA)	0
Acadia GSU - Scanlan 138kV	Bonin - Labbe 230kV (LAFA)	0
Richard - Scott1 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	0
North Crowley - Scott1 138kV	Colonial Academy - Richard 138kV	0
Acadia - Colonial Academy 138kV	Point Des Mouton - Wells 230kV	0
Richard - Scott1 138kV	North Crowley - Richard 138kV	0
North Crowley - Richard 138kV	Point Des Mouton - Wells 230kV	1
Acadia - Colonial Academy 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	8

Limiting Element	Contingency Element	ATC
Acadia GSU - Scanlan 138kV	Point Des Mouton - Wells 230kV	28
Habetz - Richard 138kV	Point Des Mouton - Wells 230kV	29
North Crowley - Richard 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	34
Scott1 - Bonin 138kV	Bonin - Labbe 230kV (LAFA)	37
Richard - Scott1 138kV	North Crowley - Scott1 138kV	46
North Crowley - Richard 138kV	Richard - Scott1 138kV	56
Acadia GSU - Scanlan 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	62
Habetz - Richard 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	67
Scott1 - Bonin 138kV	Point Des Mouton - Wells 230kV	79
Colonial Academy - Richard 138kV	Wells 500/230kV transformer	102
Scott1 - Bonin 138kV	Point Des Mouton (LAFA) - Labbe (LAFA) 230kV	112

LEPA

Limiting Element	Contingency Element	ATC
A.A.C. - Polsky Carville 230kV	Coly - Vignes 230kV	0
A.A.C. - Licar 230kV	Coly - Vignes 230kV	0
A.A.C. - Polsky Carville 230kV	Sorrento - Vignes 230kV	0
A.A.C. - Licar 230kV	Sorrento - Vignes 230kV	0
Belle Helene - Licar 230kV	Coly - Vignes 230kV	0
Belle Helene - Licar 230kV	Sorrento - Vignes 230kV	0
Belle Helene - Woodstock 230kV	Coly - Vignes 230kV	0
Vulchlor - Woodstock 230kV	Coly - Vignes 230kV	0
Belle Helene - Woodstock 230kV	Sorrento - Vignes 230kV	0
Vulchlor - Woodstock 230kV	Sorrento - Vignes 230kV	0
A.A.C. - Polsky Carville 230kV	Donaldsonville - Evergreen 230kV	0
A.A.C. - Licar 230kV	Donaldsonville - Evergreen 230kV	0
A.A.C. - Polsky Carville 230kV	Bayou Verret - Donaldsonville 230kV	0
A.A.C. - Licar 230kV	Bayou Verret - Donaldsonville 230kV	0
Belle Helene - Licar 230kV	Donaldsonville - Evergreen 230kV	0
Belle Helene - Licar 230kV	Bayou Verret - Donaldsonville 230kV	0
A.A.C. - Polsky Carville 230kV	Waterford - Willow Glen 500kV	0
A.A.C. - Polsky Carville 230kV	Waterford 500/230 transformer kV	0
A.A.C. - Polsky Carville 230kV	Bayou Verret - Welcome 230kV	0
A.A.C. - Licar 230kV	Waterford - Willow Glen 500kV	0
A.A.C. - Licar 230kV	Waterford 500/230 transformer kV	0
A.A.C. - Licar 230kV	Bayou Verret - Welcome 230kV	0
A.A.C. - Polsky Carville 230kV	St. James - Welcome 230kV	0
Belle Helene - Licar 230kV	Waterford - Willow Glen 500kV	0
Belle Helene - Licar 230kV	Waterford 500/230 transformer kV	0
A.A.C. - Licar 230kV	St. James - Welcome 230kV	0
A.A.C. - Polsky Carville 230kV	St. James - Vacherie 230kV	0
A.A.C. - Licar 230kV	St. James - Vacherie 230kV	0
Belle Helene - Licar 230kV	Bayou Verret - Welcome 230kV	0
Belle Helene - Licar 230kV	St. James - Welcome 230kV	0
Belle Helene - Woodstock 230kV	Waterford - Willow Glen 500kV	0

Limiting Element	Contingency Element	ATC
Belle Helene - Woodstock 230kV	Waterford 500/230 transformer kV	0
Vulchlor - Woodstock 230kV	Waterford - Willow Glen 500kV	0
Vulchlor - Woodstock 230kV	Waterford 500/230 transformer kV	0
Belle Helene - Woodstock 230kV	Donaldsonville - Evergreen 230kV	0
Vulchlor - Woodstock 230kV	Donaldsonville - Evergreen 230kV	0
Belle Helene - Woodstock 230kV	Bayou Verret - Donaldsonville 230kV	0
Vulchlor - Woodstock 230kV	Bayou Verret - Donaldsonville 230kV	0
Addis - Big Cajun 1 230kV	Big Cajun 2 - Webre 500kV	0
Chauvin - Ashland 115kV	Coteau - Houma 115kV	0
Addis - Big Cajun 1 230kV	Enjay - Fancy 230kV	13
Sorrento - Vignes 230kV	A.A.C. - Polsky Carville 230kV	32
Sorrento - Vignes 230kV	A.A.C. - Licar 230kV	60
Raceland - Coteau 115kV	Terrebone 230/115kV transformer	115
Chauvin - Valentine 115kV	Coteau - Houma 115kV	116

OKGE

Limiting Element	Contingency Element	ATC
Danville - North Magazine REA 161kV	ANO - Fort Smith 500kV	0

SMEPA

Limiting Element	Contingency Element	ATC
A.A.C. - Polsky Carville 230kV	Waterford - Willow Glen 500kV	0
A.A.C. - Polsky Carville 230kV	Waterford 500/230 transformer kV	0
A.A.C. - Licar 230kV	Waterford - Willow Glen 500kV	0
A.A.C. - Licar 230kV	Waterford 500/230 transformer kV	0
Belle Helene - Licar 230kV	Waterford - Willow Glen 500kV	0
Belle Helene - Licar 230kV	Waterford 500/230 transformer kV	0
A.A.C. - Polsky Carville 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
A.A.C. - Polsky Carville 230kV	Bogalusa - Franklin 500kV	0
A.A.C. - Licar 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
A.A.C. - Licar 230kV	Bogalusa - Franklin 500kV	0
Belle Helene - Licar 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
Belle Helene - Licar 230kV	Bogalusa - Franklin 500kV	0
Belle Helene - Woodstock 230kV	Waterford - Willow Glen 500kV	0
Belle Helene - Woodstock 230kV	Waterford 500/230 transformer kV	0
Vulchlor - Woodstock 230kV	Waterford - Willow Glen 500kV	0
Vulchlor - Woodstock 230kV	Waterford 500/230 transformer kV	0
Fairview - Gypsy 230kV	French Settlement - Sorrento 230kV	0
French Settlement - Sorrento 230kV	Fairview - Gypsy 230kV	0
French Settlement - Sorrento 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
French Settlement - Sorrento 230kV	Bogalusa - Franklin 500kV	0
Belle Helene - Woodstock 230kV	Bogalusa - Adams Creek 500/230kV transformer	0
Belle Helene - Woodstock 230kV	Bogalusa - Franklin 500kV	0
Vulchlor - Woodstock 230kV	Bogalusa - Adams Creek 500/230kV transformer	0

Vulchlor - Woodstock 230kV	Bogalusa - Franklin 500kV	0
French Settlement - Sorrento 230kV	Front Street - Slidell 230kV	0
Fairview - Gypsy 230kV	French Settlement - Springfield 230kV	0
Fairview - Gypsy 230kV	Hammond - Springfield 230kV	0

SOCO

Limiting Element	Contingency Element	ATC
NONE	NONE	125

SWPA

Limiting Element	Contingency Element	ATC
Jonesboro - Jonesboro North (AECC) 161kV	Heber Springs South - Quitman 161 kV	0
Jonesboro - Jonesboro North (AECC) 161kV	Heber Springs South - Heber Industrial 161kV	72

TVA

Limiting Element	Contingency Element	ATC
NONE	NONE	125