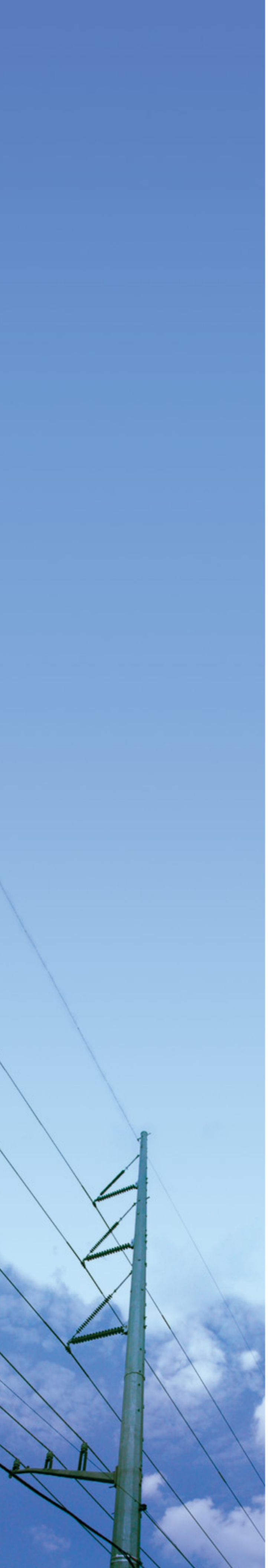

ICT Reliability Assessment

DRAFT

July 2009

Southwest Power Pool

Table of Contents

ICT Reliability Assessment

DRAFT

Introduction

Southwest Power Pool (SPP) acts as the Independent Coordinator of Transmission (ICT) for Entergy. The ICT performs a number of functions under the provisions of Entergy's Open Access Transmission Tariff (OATT). Among these functions is an annual reliability assessment of Entergy's transmission system, which includes an evaluation of Entergy's draft construction plan for the next three years. The ICT's reliability assessment and construction plan evaluation are part of an overall planning process which culminates in the development of Entergy's Construction Plan and the ICT's Base Plan. The ICT's Base Plan includes all projects that the ICT believes are necessary to comply with Entergy's Planning Criteria and thus is focused on reliability needs. The Base Plan forms the basis for cost allocation under Attachment T of Entergy's OATT.

ICT Reliability Assessment Scope

The objective of the Reliability Assessment is to assess the ability of the Entergy transmission system to perform according to Entergy's Planning Criteria in both near-term and long-term horizons. Entergy's Planning Criteria are set out in the OATT and are posted on Entergy's OASIS.

<u>Entergy's Planning Criteria</u>

- NERC TPL Standards
- SERC Supplements to NERC Standards
- Entergy Transmission Local Criteria
- Entergy Transmission Planning Guidelines (Business Practices)

Entergy's compliance with NERC Reliability Standards is facilitated through the SERC Reliability Corporation (SERC) which is not affiliated with SPP. The ICT's reliability assessment is not a substitute for the compliance processes required by NERC and SERC. Where the ICT reliability assessment shows possible overloads or voltage problems, this does not indicate non-compliance with NERC or SERC standards, but rather provides the ICT's view of overall reliability with respect to Entergy's Planning Criteria.

The ICT has certain discretion under Entergy's OATT regarding the application of Entergy's Planning Criteria. Using this discretion, the ICT has applied interpretations or enhancements with respect to the Planning Criteria. These enhancements provide that (1) "non-consequential load" shed will not be used as a mitigation plan, and (2) the amount of "consequential load" exposed to possible load shedding for contingency situations is limited to 100 MW.

The reliability assessment included an evaluation of the transmission system under multiple scenarios:

- System Intact – with all elements in their normal configuration
- N-1 Contingency – outage of every single transmission segment individually
- Transmission Circuit Contingency – outage of a single transmission circuit by operation of protective devices (breaker-to-breaker contingency)

These scenarios were evaluated (1) with the "Approved" projects in the current 2009-2011 Construction Plan and (2) with both "Approved" and "Proposed and In-Target" projects in the draft 2010-2012 Construction Plan. The amount of consequential load associated with a particular transmission circuit contingency was determined for that scenario.

Two additional analyses were performed:

- A Low Hydro scenario evaluating the effect of the reduced availability of hydro generation in north Arkansas during dry summer months.
- Specific contingencies defined in the Planning Criteria for Load Pockets.

The full reliability assessment scope was discussed with and commented on by stakeholders at the March 17, 2009 LTTIWG meeting and can be found in Attachment A to this report.

Entergy's Draft Construction Plan

The draft Construction Plan developed by Entergy includes all transmission projects that Entergy expects to construct or initiate construction of during the 2010-2012 time period. The Construction Plan includes projects that Entergy believes are necessary to satisfy Entergy's Planning Criteria as well as other economic upgrade projects.

Projects shown in Entergy's draft Construction Plan with funding comment "Approved" are those expected to have funds budgeted in 2010 towards their construction. "Proposed and In Target" projects are expected to be budgeted for construction in 2011 and/or 2012 based on current projections. Some projects may have in-service dates beyond the 2010-2012 period.

The ICT posted Entergy's draft Construction Plan on Entergy's OASIS on May 13, 2009. Entergy reviewed the draft Construction Plan with stakeholders at the June 9, 2009 LTTIWG meeting. The presentation can be found in the meeting background materials. Stakeholders were invited to comment on the plan.

New Projects in the Draft 2010-2012 Construction Plan

Projects that are new in the draft 2010-2012 Construction Plan

Project Name	Projected In-service Date	Funding Comments
Delhi 115 kV Substation – Add 10 Ohm series reactor	2012	Proposed & In Target
Grand Gulf Uprate Project - Baxter Wilson to Ray Braswell 500 kV line uprate breakers and switches	2011	Proposed & In Target
Grand Gulf Uprate Project - Upgrade Hartburg to Inland Orange to McLewis 230 kV Line	2011	Proposed & In Target

Completed Projects From the Prior 2009-2011 Plan

Projects that were in the 2009-11 Construction Plan that have been completed.

Project Name	Notes
Natchez DVARS and Cap Bank (Natchez Delisting)	Completed
Dewitt: Install 10.8 MVAr Capacitor Bank	Completed
Little Rock 8th and Woodrow - Upgrade capacitor bank to 33.3 MVAR	Completed
Little Rock Boyle Park - Upgrade capacitor bank to 33.3 MVAR	Completed
Little Rock Rock Creek - Install new 30.5 MVAR capacitor bank	Completed
Little Rock W Markham - Install new 30.5 MVAR capacitor bank	Completed
Maumelle East Substation - Install Second Transmission Tie	Completed
Rison: Upgrade switch risers	Completed
Conway West - Donaghey: Reconductor with 666 ACSS	Completed
Winn: Install 69kV Cap Bank	Completed
Capitol Substation: Property Improvements	Completed
Amite South Import Improvement: Phase 3	Completed
Southeast LA Coastal Improvement Plan: Phase 1 - Peters Road 230 kV Transfer Bus	Completed
Destrehan: Install Line Breaker	Completed
Install 40MVAR Cap Bank at Houma	Completed
Amite South Import Improvement: Phase 2	Completed
Liberty-Gillsburg 115 kV upgrade	Completed
Natchez DVARS and Cap Bank (Natchez Delisting)	Completed

Other Changes Between the Current (2009-11) and Draft (2010-12) Plans

Projects that have had modifications made to the expected in-service dates (ISD) and other changes:

Project Name	Type of Change	Changed From	Changed To
Western Region Reliability Improvement Plan Phase 3 Interim	Scope	Add Alden SVC [removed]	Relocate Sheco's Caney Creek 138 kV Substation [added]
Church Rd Substation & 11.3 miles 230kV	ISD	2010	2012
Grenada/Winona/Greenwood Area Improvement (Tillatoba auto alternative): Phase 1	ISD	2011	2013
Grenada/Winona/Greenwood Area Improvement (Tillatoba auto alternative): Phase 2	ISD	2013	2014
Indianola-Greenwood: Upgrade jumpers and buswork (Morehead, Itta Bena, Greenwood)	ISD	2009	Winter 2009
Tamina - Cedar Hill Reconductor	ISD	2011	Winter 2011

The full draft 2010-2012 Construction Plan is available on the ICT Planning Page on Entergy's OASIS.

Reliability Assessment and Construction Plan Evaluation Results

Near-Term Period – 2010 and 2014

An analysis of system intact conditions revealed few problems. Melbourne-Sage 161 kV is projected to be overloaded in the winter seasons and to also be heavily loaded (though not overloaded) in the summer seasons. Emerging thermal problems are Mossville-Canal La 69 kV, Scott-Rayne 69 kV, and Zachary REA-Port Hudson 69 kV. Mount Ida 115 kV voltage is projected to be slightly low in 2010 summer. High voltages are noted on the secondary sides of a few transformers.

Summary results of single contingency scans—with Entergy's draft Construction Plan projects included—are provided in Attachment B to this report showing thermal overloads, low and high voltages. The full contingency scan results are available on the ICT Planning Page on Entergy's OASIS. The attachments reflect the results of both bus-to-bus and breaker-to-breaker analyses and the application of the 100 MW Rule discussed above. There are a number of overloads and low voltages in 2010 that do not appear in later years. This is primarily because Construction Plan projects that have in-service dates between 2010 and 2014 were included in the 2014 models, but not the 2010 models. In many cases, there are draft Construction Plan projects which will address these problems, though not before 2010 summer. Among the areas in this category are:

- Chlomal-Jennings 69 kV corridor
- Acadiana Area
- Holiday-Lafayette 69 kV
- South Jackson-Brookhaven 115 kV corridor
- Tillatoba-Winona 115 kV corridor
- Lynch-McAlmont 115 kV
- Harrison-Eureka 161 kV corridor

In addition, there are a few potential problem areas in the 2010 and 2014 seasons that do not currently have upgrades identified in the Construction Plan. Of particular note are:

- 115 kV system south of Valentine-Barataria-Port Nickels
- Waterford-Tezcuco 230 kV and Belle Point-Gypsy 230 kV
- Kenner-Snakefarm 115 kV
- Waterways-Vicksburg East 115 kV
- Hornlake-Hernando 115 kV Corridor
- Baxter Wilson-Ray Braswell 500 kV (a project is included in the Revised Draft which will address this)
- Minden-Minden Lagen 115 kV
- Benton-Bauxite-Mabelvale 115 kV Corridor
- Cabot Area 115 kV Voltage
- Morrilton East-Gleason-Tyler 161 kV
- Marked Tree-Twist-Parkin 161 kV

Some of these problems may be manageable through Operating Guides. The impact of Operating Guides will be determined during the development of the Base Plan later in the planning cycle.

There are a few high voltages associated with contingencies. These appear primarily at transformer secondaries and most are not of concern, particularly during peak periods. Especially high voltages at Mt. Olive 500 kV and Walnut Ridge-Paragould 115 kV should be examined more closely, especially under light-load conditions.

Low Hydro

In addition to the base case conditions, an analysis was performed to simulate limited availability of hydro resources during summer peak periods. The three summer models (2010, 2014, and 2018) were tested for the unavailability of two large units individually and with multiple units at 50% of their base case dispatch. A single contingency scan was then performed for each case.

This scenario revealed several potential problems that either manifested only under these conditions or were made more severe. In some cases, this may indicate a need to accelerate planned upgrades or mitigation plans or develop new ones. Areas in which these conditions appeared include the system around Conway, Harrison-Eureka 161 kV, and Norfork-Sage 161 kV. A list of these conditions is included in the attachments.

Load Pockets

Load Pocket sensitivities were performed according to the contingencies defined in the Planning Criteria for the Western Region, Amite South, and Downstream of Gypsy (DSG) load pockets. In general, the Planning Criteria calls for load pockets to be planned to withstand simultaneous loss of both a large generator and a transmission line. In Western Region, the criteria calls for the system to withstand the loss of one Lewis Creek unit and a transmission line. In Amite South, the criteria calls for the loss of the largest unit (currently Waterford 3) and the most critical transmission element (Waterford-Willow Glen 500 kV). In DSG, the criteria calls for the system to withstand the loss of one large unit and a transmission line. The system was tested (1) for loss of Ninemile 5 and a 230 kV line into the load pocket, and (2) for loss of Michoud 3 and a 230 kV line into the load pocket. The sensitivities were performed on the 2014 summer model.

The results were that although some voltage and loading conditions were more severe under these conditions, there were no problems identified that were not also identified as problems under single contingency conditions.

Longer-Term Period – 2018

Analysis of the 2018 model indicated a number of overloads and voltage problems that do not appear in the earlier seasons. These indicate potential emerging problems that may manifest with increasing load levels. Because they are beyond the near-term period, it is not expected that these conditions will require upgrades in the next Base Plan, but may indicate areas that should be monitored and considered in the development of long-term plans.

- Tubular-Dobbin 138 kV
- Eastgate, Huffman 138 kV
- Scott-Carencro 69 kV
- Sorrento-Gonzales 138 kV
- Gypsy-Claytonia 115 kV
- Jackson South-Jackson East 115 kV
- DeSoto and Walls 115k V
- Trumann-Trumann West 161 kV
- Bull Shoals-Norfork 161 kV
- Quitman-Greers Ferry 161 kV

In contrast to these new problems, other loading and voltage problems in the 2018 model can be characterized as extensions of problems occurring in earlier seasons. These should be taken into consideration in the development of the Construction Plan in order to optimize the economic benefit of currently-planned construction projects.

- Hernando-Batesville 115 kV
- Haskell-Benton South 115 kV
- 115 kV and 161 kV system around Conway, Arkansas
- Dayton-Porter 138 kV
- Brady Heights 69 kV Area
- Claytonia and Norco 115 kV
- Arcadia and Texas Eastern 115 kV
- 115 kV System around Helena
- Cabot Area 115 kV

Stakeholder Participation

Attachment K of Entergy's OATT describes the planning process which includes stakeholder involvement through the Long-Term Transmission Issues Working Group (LTTIWG). Stakeholder participation and review is a key function of the LTTIWG, which incorporates vital input from stakeholders throughout the planning process. LTTIWG meetings are open, and the agendas are posted on SPP.org. Entergy stakeholders are encouraged to actively participate in the LTTIWG to ensure that all points of view are represented in the transmission planning process. Stakeholders are invited to comment on this reliability assessment and the subsequent development of the final Construction Plan and Base Plan. Formal avenues for stakeholder involvement that have been completed and that are planned in this planning cycle include:

- Review of and input to the ICT's Reliability Assessment Scope at LTTIWG March 17, 2009
- Review of and input to Entergy's draft Construction Plan at LTTIWG on June 9, 2009
- Review of and input to the ICT's draft Reliability Assessment at LTTIWG on July 22, 2009
- Review of and input to the ICT's final Reliability Assessment at Transmission Summit August 11, 2009
- Review of stakeholder comments at September LTTIWG
- Review of the ICT's draft Base Plan at October/November LTTIWG
- Review of the ICT's final Base Plan at January LTTIWG

Attachments

Attachment A - Reliability Assessment Scope

Attachment B - Contingency Scan Results
- Thermal Overloads
- Low Voltages
- High Voltages
- Low Hydro Thermal
- Low Hydro Voltages

2010 ICT Reliability Assessment Scope

Objective

The objective of the Reliability Assessment is to assess the ability of the Entergy transmission system to perform according to the Planning Criteria in both near-term and long-term horizons.

Models

- Base Case 2008-Series Update1.
- Summer and Winter Peak 2010 and 2014 for near-term.
- Summer Peak 2018 for longer-term.

Model Preparation

The Base Case Model will be updated to reflect:

1. The latest confirmed transmission service reservations.
2. Updated topology: equipment which has been newly placed in-service.
3. Committed and Proposed Construction Plan Projects in the season in which the facilities are expected to be complete and for all seasons thereafter.

Software

- PSSE v31
- MUST 8

Contingency Scan

Category A

1. The Base Case Model will be evaluated under normal, system-intact conditions.
2. Monitored elements must remain within the thermal and voltage limits specified in Entergy's Transmission Local Planning Criteria for Category A, currently flows less than 100% of RATEA; voltages between 0.95 and 1.05 per unit.
3. Identify all elements that do not meet the Category A limits.

Category B

1. An N-1 contingency scan will be run on the Base Case Models.
2. Monitored elements must remain within the thermal and voltage limits specified in Entergy's Transmission Local Planning Criteria for Category B, currently flows less than 100% of RATEA; voltages between 0.92 and 1.05 per unit.
3. For each monitored element that does not remain within these limits, the breaker-to-breaker circuit for the contingency will be identified and an analysis will be done with the entire circuit out of service, if the breaker-to-breaker outage differs from the simulated outage.
4. The amount of load shed by breaker operation, Consequential Load, will be recorded and reported for constrained elements.

Monitored Elements

- Entergy Internal:
  - Transmission elements within Entergy's footprint (including embedded Areas) with nominal voltage 69 kV and higher.
  - Ties to outside Areas at 69 kV and higher.

- CLECO & LUS: Transmission elements with nominal voltage 69 kV and higher.
- All other first-tier Areas (AECI, SOCO, TVA, SMEPA, SWPA, AEPW, OKGE, EMDE): Transmission elements with nominal voltage 345 kV and higher.

Contingencies

- Same as Monitored Elements

THERMAL OVERLOADS

Entergy Draft 2010-2012 Construction Plan Included in Model

System Intact

System Intact Overload (% RateA)

MONITORED ELEMENT	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
335094 2MOSSVL 69 - 335102 2CANAL-LA 69 1				101.9	102.0
335346 2SCOTT 69 - 503304 RAYNE 2 69 1					105.5
335781 2ZAC REA 69 - 335782 2PTHUDSONA 69 1			101.3		114.0
338131 5MELBRN 161 - 338132 5SAGE * 161 1		103.3		104.6	

Single Contingency

Highest Contingency Overload (% of RateA)

MONITORED ELEMENT	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
334043 4TUBULAR 138 - 334044 4DOBBIN 138 1					124.0%
334120 4NU LJON 138 - 334211 4BDAYTON 138 1					106.6%
334282 4RAYBURN 138 - 334330 4JASPER 138 1					101.1%
334413 4PNEC BK 138 - 334430 4SABINE 138 1			102.0%		106.0%
334414 4LINDE 138 - 334430 4SABINE 138 1			100.9%		104.6%
334600 2KOLBS 69 - 334620 2LAKEVEW 69 1			100.7%	101.6%	102.1%
335094 2MOSSVL 69 - 335107*2ALFOL 69 1	104.9%		106.8%		106.1%
335094 2MOSSVL 69 - 335108*2L253ATP 69 1	102.9%		104.8%		104.1%
335125 4MOSSVL 138 - 335200 4NELSON 138 1					103.4%
335190 6NLSON 230 - 303101 6MOSBLF 230 1			106.4%		110.7%
335217 2CHLOMAL 69 - 335250*2IOWA 6 69 1	108.9%				
335217 2CHLOMAL 69 - 335253 2LACASNE 69 1	109.1%				
335258 2COMPTON 69 - 335259*2L13ATP 69 1	110.3%				
335259 2L13ATP 69 - 335266*2JENNGS 69 1	111.6%				
335346 2SCOTT 69 - 335435 2CARNCRO 69 1					122.0%
335378*4SCOTT2 138 - 303152 4SEMERE 138 1	107.2%				
335379*4SCOTT1 138 - 303130 4NCROWL 138 1	104.2%				
335379*4SCOTT1 138 - 303132*4JUDICE 138 1	109.3%	108.8%			
335380*4MEAUX 138 - 303132*4JUDICE 138 1	101.4%				
335387*4DELCAMB 138 - 335388 4MORIL 138 1	103.1%				
335389*4DUBOIN 138 - 335390 4BUWHSE 138 1	126.9%				
335390*4BUWHSE 138 - 500440 IVANHOE4 138 1	101.9%				
335391 4CECELIA 138 - 303152 4SEMERE 138 1				103.7%	
335400 2FIVEPTS 69 - 335401 2TIGRE 69 1			105.6%		113.2%
335401 2TIGRE 69 - 335403 2L-247TP 69 1					103.7%
335411*2HOLIDAY 69 - 335412 2LAFAYET 69 1	116.3%				101.7%
335439 2L658TP 69 - 335441 2L637TP 69 1					100.0%
335536 6ADDIS 230 - 303000 6CAJUN1 230 1				103.1%	
335593 4MONOCM1 138 - 335595*4ALCHEM 138 1		102.1%			
335595*4ALCHEM 138 - 335601 4WGLEN-2 138 1		101.0%			101.1%
335610 4WGLEN 138 - 335628 T300/331 138 1					102.3%
335625 4GONZL 138 - 336050 4SORXFM 138 1					141.1%
335627 4OAKGROV 138 - 335628 T300/331 138 1					102.3%
335782 2PTHUDSONA 69 - 335805 4PT HUD 138 1					100.1%

Single Contingency

Highest Contingency Overload (% of RateA)

MONITORED ELEMENT	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
335787 2MCMANUS 69 - 335788 2BRADYH 69 1					101.0%
335791 2TEJAC 69 - 335792 2MRYDALE 69 1			104.8%	104.9%	111.0%
335796 2PTHUDSONB 69 - 335805 4PT HUD 138 2					100.1%
336037 3VLNTIN 115 - 336080 3CLOVEL 115 1			125.1%		123.7%
336050 4SORXFM 138 - 336051 3SORNTO 115 1					132.4%
336060*6SORR 2 230 - 303200 6VIGNES 230 1		102.7%			
336068 6BLPNT 230 - 336190 6GYPSY 230 1			113.7%		113.7%
336069 6TEZCUCO 230 - 336154 6WATFRD 230 1			101.7%		101.6%
336080 3CLOVEL 115 - 336081 3GMEADW 115 1			103.5%		102.4%
336092*3CARLSL 115 - 336293 3PTNICK 115 1	124.4%	122.0%	126.9%	123.8%	126.3%
336111 3AMITE 115 - 336517*3GILBR* 115 1		105.0%			
336131 6ADMSCRK 230 - 336136*6BOGALUS 230 2		126.3%			
336220 3GYPSY 115 - 336230 3CLAYTN 115 1					101.6%
336232*3KENNER 115 - 336233 3SNFARM 115 1	100.3%		109.4%	108.6%	118.9%
336515*3LIBRTY 115 - 336517*3GILBR* 115 1		102.3%			
336552 3NORFLD 115 - 336553*3MALIL* 115 1		104.1%			
336553*3MALIL* 115 - 336554 3BROKHV 115 1		108.4%			
336554 3BROKHV 115 - 336770*3WESSON 115 1	103.1%				
336765 3FLRNCE 115 - 336890*3JAX-S 115 1		106.2%			
336771 3JAM RD* 115 - 336772*3HZLHST 115 1	125.2%				
336772 3HZLHST 115 - 336773*3COPHSW* 115 1	109.1%				
336805 3WATERWY 115 - 336806 3VKB-E* 115 1			107.9%		107.7%
336830 8B.WLSN 500 - 336839 8R.BRAS 500 1				102.2%	
336871*3JAX-FH 115 - 336880 3R.BRAS 115 1	108.1%				
336890 3JAX-S 115 - 336911 3JAX-E 115 1					103.6%
336897*3PELAHE 115 - 336898 3MORTON 115 1		104.9%			
337040 6ANDRUS 230 - 337042 3ANDRUS 115 1					103.1%
337060 3WINONA 115 - 337061*3SAWYR* 115 1	106.6%				
337098 3CLARKD 115 - 337100*6MEPSCLK 230 1	120.6%	120.7%	120.5%	120.1%	120.5%
337126 3BATESV 115 - 337135 3SARDIS 115 1					124.4%
337135 3SARDIS 115 - 337136 3SNTOBI 115 1					106.4%
337136 3SNTOBI 115 - 337137 3CLDWTR 115 1					134.4%
337137 3CLDWTR 115 - 337138 3HRNADO 115 1					112.7%
337139 3GETWEL 115 - 337141 3NESBT* 115 1					104.2%
337143 3PLUM PT 115 - 337144 3GRNBRK 115 1					120.2%
337144 3GRNBRK 115 - 337150 3HN LAK 230 1			120.5%		159.5%
337150 3HN LAK 115 - 337150 3HN LAK 230 1					100.4%
337361 3MINDEN 115 - 303302 3MNDENLG 115 1			127.2%	121.0%	142.6%
337674 3AMITY * 115 - 338850*3ALPINE# 115 1		100.5%			
337678*3BISMRK 115 - 337685*3HSEHVW 115 1	100.7%	111.6%			
337678*3BISMRK 115 - 338850*3ALPINE# 115 1		104.8%			
337800 3HASKEL 115 - 337801 3BENT-S* 115 1					105.0%
337803 3BRYANT 115 - 337804 3MABEL 115 1			100.2%		112.6%
337905 5RUSL-E 161 - 337906 5RUSL-N 161 1					100.6%
337921 5MOR-E 161 - 337927 5GLEASN 161 1			105.7%		119.0%
337927 5GLEASN 161 - 338424 5TYLER 161 1			101.5%		115.0%

Single Contingency

Highest Contingency Overload (% of RateA)

MONITORED ELEMENT	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
337928 3CONW-W 115 - 338422 5CONW-W 161 1					102.7%
337929 3LK CON 115 - 337930 3MAYFL 115 1					111.0%
337936 3SYLVN 115 - 337938 5SYLVN 161 1					110.8%
337938 5SYLVN 161 - 338748 5GRAVEL# 161 1					114.6%
337939 5GOLDCR* 161 - 337940 5HAMLET* 161 1			100.6%		117.4%
337952 3LYNCH 115 - 338481*3MCALMT 115 1	111.9%				
338033 5PARKIN 161 - 338041 5TWIST 161 1			103.4%		121.0%
338041 5TWIST 161 - 338165 5MTREE 161 1			101.2%		118.0%
338104*5HARR-E 161 - 338681 5HARR-S 161 1	101.1%				
338108 5ST_JOE 161 - 338110*5HILLTOP 161 1		102.9%		101.3%	
338123 5BULLSH* 161 - 505460 BULL SH5 161 1			101.1%		106.0%
338130 5CALCR 161 - 338131*5MELBRN 161 1		115.3%		114.1%	100.6%
338130*5CALCR 161 - 505448 NORFORK5 161 1		108.2%		107.1%	
338131 5MELBRN 161 - 338132*5SAGE * 161 1	101.7%		102.4%		108.0%
338169 5TRUMAN 161 - 338707 5TRUM-W# 161 1					111.0%
338422 5CONW-W 161 - 338424 5TYLER 161 1					100.2%
338483 3NLR-DX 115 - 338487 3LAKEWD 115 1					108.8%
338682 5OSAGE # 161 - 506932*EUREKA 5 161 1	100.2%				
338813 5MIDWAY# 161 - 505460 BULL SH5 161 1					102.9%
338814 5SOLAND# 161 - 505448 NORFORK5 161 1					105.9%

LOW VOLTAGES

Entergy Draft 2010-2012 Construction Plan Included in Model

System Intact — Low System Intact Voltage (per unit)

MONITORED BUS	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
334000 2CALVERT 69			0.9488		0.9455
334681 3NECHESO 69	0.9455	0.9438	0.9398	0.9371	0.9363
335276 2KLONDKE 69					0.9451
335275 2LKARTHR 69					0.9420
337676 3GLENWD 115	0.9492				
337677 3MT IDA 115	0.9407				

Single Contingency — Lowest Contingency Voltage (per unit)

MONITORED BUS	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
334084 4CLVELND 138					0.9197
334111 4NEWCANY 138			0.9105		0.8573
334112 4HICKORY 138			0.9195		0.8732
334113 4EASTGAT 138					0.8898
334114 4HUFFMAN 138					0.8860
334115 6L533TP8 138					0.9133
334116 4KLMP-EX 138					0.9133
334209 4ROLKERD 138					0.9164
334210 4ADAYTON 138					0.9174
334211 4BDAYTON 138					0.9174
334216 4GORDON 138					0.9162
334283 4MILLCR 138				0.9068	0.9172
334284 4PINELND 138				0.9100	
334285 4BROADUS 138				0.9113	
334286 4ETOIL 138				0.9117	
334300 4PEACH 138				0.9153	
334437 6KOLBS 230					0.9186
334438 6HANKS 230					0.9184
334439 6VFWPK 230					0.9177
335137 2PPC NO 69	0.8998	0.8756	0.8877	0.8717	0.8922
335379 4SCOTT1 138	0.9091				
335380 4MEAUX 138	0.8849	0.9017			
335385 4LEROY 138	0.8767	0.8919			
335386 4ABBVIL 138	0.8707	0.8886			
335387 4DELCAMB 138	0.8994				
335388 4MORIL 138	0.9099				
335391 4CECELIA 138	0.9067				
335435 2CARNCRO 69					0.9183
335788 2BRADYH 69					0.9133
335789 2CLINTON 69					0.9125
335790 2CLNTREA 69					0.9133
336085 3ALLIA 115	0.4661	0.5015	0.4331	0.4893	0.4564

Single Contingency Lowest Contingency Voltage (per unit)

MONITORED BUS	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
336092 3CARLSL 115	0.8046	0.8156	0.7954	0.8109	0.7995
336230 3CLAYTN 115					0.9120
336231 3NORCO 115					0.9146
336772 3HZLHST 115	0.9169				
336773 3COPHSW* 115	0.9151				
336774 3GALLMAN 115	0.9081				
336775 3CRYSPG 115	0.9017				
336776 3TERRY 115	0.8853				
336777 3BYRAM 115	0.8802				
336898 3MORTON 115					0.9188
337061 3SAWYR* 115	0.9140				
337062 3ELLIOT 115	0.8878				
337063 3S GREN 115	0.8841				
337064 3GRNADA 115	0.8781				
337065 3TILTOB 115	0.8701				
337066 3TVA-SHE 115	0.8692				
337067 3CHRSTN 115	0.8593				
337136 3SNTOBI 115					0.8529
337137 3CLDWTR 115					0.8253
337138 3HRNADO 115	0.9167		0.9144		0.7952
337139 3GETWEL 115	0.9139		0.9142		0.8655
337140 6GETWELL 230	0.9114		0.9163		0.8713
337141 3NESBT* 115	0.9131		0.9119		0.8620
337142 3NESBIT 115	0.9111		0.9094		0.8588
337143 3PLUM PT 115	0.9135		0.9112		0.8607
337144 3GRNBRK 115	0.9177		0.9159		0.8675
337150 3HN LAK 115					0.8838
337151 3DESOTO-MS 115					0.8875
337152 3WALLS 115					0.9039
337180 6HN LAK 230	0.9121				0.8790
337367 3ARCADIA 115					0.9000
337555 3T.E. F 115					0.9145
337800 3HASKEL 115					0.9191
337801 3BENT-S* 115			0.9135		0.8974
337802 3BAUXIT 115	0.9098		0.8948		0.8757
337803 3BRYANT 115	0.9069		0.8914		0.8716
337981 3MARVEL 115					0.9155
337982 3BARTON 115					0.9119
337983 3HELN-W* 115					0.9089
337984 3HELN-C 115					0.9073
338006 3CABOT 115			0.9086		0.8577
338007 3BEEBE 115			0.9155		0.8713
338008 3GARNER* 115					0.8909
338009 3T.E.MC 115					0.8907
338017 3HOLBT-C 115			0.9091		0.8582
338050 3T.E.#6 115					0.9191

Single Contingency Lowest Contingency Voltage (per unit)

MONITORED BUS	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
338112 5HEBR-S 161					0.9108
338113 5HEBR-I 161					0.9087
338160 5EBON S* 161					0.9185
338410 5WM-DOV 161					0.9170
338411 5WM-GAT 161					0.9172
338413 5WM-LH2 161					0.9163
338414 5WM-POK 161					0.9125
338420 5DONAGHE 161					0.9009
338421 5CONW-S 161					0.9019
338423 5CONIND 161					0.9032
338583 WARD1 69					0.8777
338756 3WARD # 115			0.9022	0.9180	0.8558
338757 3BRYNTS# 115	0.9077		0.8922		0.8726
338758 5HEBR-N# 161					0.9069
338880 3HELN-I 115					0.9069

HIGH VOLTAGES

Entergy Draft 2010-2012 Construction Plan Included in Model

System Intact — High System Intact Voltage (per unit)

MONITORED BUS	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
337181 5HN LAK 161	1.0605	1.0562			
338581 DELUCE1 69	1.0512	1.0578		1.0518	
337084 DELTA U2 69				1.0748	
338205 3PARAG 115		1.0533		1.0542	
338552 HARRISON-S1 69		1.0554			
338585 HEBERSP1 69		1.0545			

Single Contingency — Highest Contingency Voltage (per unit)

MONITORED BUS	2010 Summer	2010 Winter	2014 Summer	2014 Winter	2018 Summer
334020 4BRYAN 138	1.0544				
337010 8WOLFCRK 500	1.0504	1.0504	1.0504	1.0504	1.0504
337011 6ATTALA 230		1.0573			
337084 DELTA U2 69	1.0589		1.0637		1.0600
337368 8MTOLIV 500	1.0685	1.0666	1.0697	1.0723	1.0718
337967 3RICUS 115	1.0567	1.0608	1.0543	1.0571	
337969 3STUTT-I 115		1.0549			
337970 3ULM 11 115		1.0512			
338205 3PARAG 115	1.0589		1.0598		1.0515
338206 3SEDGWK* 115	1.0586	1.0649	1.0592	1.0679	1.0502
338207 3T.E.#7 115	1.0571	1.0633	1.0576	1.0663	
338208 3WALNUT 115	1.0589	1.0651	1.0595	1.0682	1.0505
338552 HARRISON-S1 69	1.0528			1.0543	
338570 BLACKROCK1 69		1.0508		1.0519	1.0675
338578 OPPELO 69		1.0535			
338581 DELUCE1 69			1.0603		1.0551
338585 HEBERSP1 69	1.0547		1.0546	1.0547	
338704 3LIGHT # 115	1.0583	1.0645	1.0589	1.0675	
338710 3CRO-RG# 115	1.0584	1.0644	1.0590	1.0676	1.0501

SINGLE CONTINGENCY THERMAL OVERLOADS FOR LOW-HYDRO CONDITIONS
Overloads that are more severe (5%+) or appear only for a low-hydro scenario.

% RateA

MONITORED ELEMENT	2010 Summer	2014 Summer	2018 Summer
337705 3CHEETA* 115.00 - 337707 3HS-VIL 115.00 1			100.5%
337921 5MOR-E 161.00 - 337927 5GLEASN 161.00 1	103.6%	118.4%	138.0%
337925 5GREENB 161.00 - 337926 5QUITMN 161.00 1		108.0%	116.1%
337927 5GLEASN 161.00 - 338424 5TYLER 161.00 1		114.1%	133.7%
337928 3CONW-W 115.00 - 337929 3LK CON 115.00 1			113.3%
337928 3CONW-W 115.00 - 338422 5CONW-W 161.00 1			114.6%
337929 3LK CON 115.00 - 337930 3MAYFL 115.00 1		110.8%	120.3%
337930 3MAYFL 115.00 - 337931 3MORGAN 115.00 1			100.2%
337936 3SYLVN 115.00 - 337938 5SYLVN 161.00 1			112.3%
337938 5SYLVN 161.00 - 338748 5GRAVEL# 161.00 1			117.8%
337939 5GOLDCR* 161.00 - 337940 5HAMLET* 161.00 1			101.4%
338100 5BERRYV 161.00 - 338101 5GR FOR 161.00 1			101.9%
338101 5GR FOR 161.00 - 338103 5GRFORS 161.00 1			105.0%
338102 5HARR-W 161.00 - 338103 5GRFORS 161.00 1			112.4%
338102 5HARR-W 161.00 - 338681 5HARR-S 161.00 1		115.5%	143.6%
338104 5HARR-E 161.00 - 338107 5EVRTON 161.00 1			108.9%
338104 5HARR-E 161.00 - 338681 5HARR-S 161.00 1	107.3%	124.1%	154.1%
338108 5ST_JOE 161.00 - 338110 5HILLTOP 161.00 1		102.4%	115.2%
338125 5MT HOM 161.00 - 338814 5SOLAND# 161.00 1			105.3%
338130 5CALCR 161.00 - 338131 5MELBRN 161.00 1	114.8%	113.9%	
338130 5CALCR 161.00 - 505448 NORFORK5 161.00 1	109.9%	112.2%	115.2%
338131 5MELBRN 161.00 - 338132 5SAGE * 161.00 1	115.1%		
338138 5MORFLD 161.00 - 338142 5ISES 1 161.00 1		100.4%	106.5%
338186 5MONETE 161.00 - 338204 5PARAG 161.00 1	101.1%		
338422 5CONW-W 161.00 - 338424 5TYLER 161.00 1		101.1%	113.6%
338814 5SOLAND# 161.00 - 505448 NORFORK5 161.00 1			111.7%

SINGLE CONTINGENCY LOW VOLTAGES FOR LOW-HYDRO CONDITIONS

Lowest Contingency Voltage (per unit)

MONITORED BUS	2010 Summer	2014 Summer	2018 Summer
337939 5GOLDCR* 161.00			0.9139
337940 5HAMLET* 161.00			0.9132
337941 5HAMLT 161.00			0.9132
338100 5BERRYV 161.00	0.9070	0.8470	
338101 5GR FOR 161.00	0.9153	0.8570	
338102 5HARR-W 161.00		0.8843	
338103 5GRFORS 161.00	0.9161	0.8587	
338104 5HARR-E 161.00		0.9036	0.8309
338105 5OMAHA * 161.00			0.8701
338106 5OMAHA 161.00			0.8701
338107 5EVRTON 161.00		0.9084	0.8420
338108 5ST_JOE 161.00		0.9159	0.8567
338109 5MARSHL 161.00			0.8819
338110 5HILLTOP 161.00			0.8765
338112 5HEBR-S 161.00		0.7716	0.9131
338113 5HEBR-I 161.00		0.8022	0.9122
338120 5LEAD HL 161.00			0.9070
338121 5SUMMIT 161.00			0.8657
338122 5FLIPN 161.00			0.8786
338123 5BULLSH* 161.00			0.8864
338124 5BULLSH 161.00			0.8864
338125 5MT HOM 161.00			0.9099
338161 5WM-EHV 161.00	0.9198		
338410 5WM-DOV 161.00	0.9191		0.9196
338411 5WM-GAT 161.00	0.9191		0.9198
338413 5WM-LH2 161.00	0.9195		
338414 5WM-POK 161.00	0.9187		0.9194
338420 5DONAGHE 161.00		0.9052	
338421 5CONW-S 161.00		0.9060	
338423 5CONIND 161.00		0.9073	
338552 HARRISON-S1 69.000		0.9136	0.8277
338554 OSAGE-CR1 69.000		0.8646	
338556 OSAGE-CR2 69.000		0.8646	
338585 HEBERSP1 69.000	0.8757	0.8676	0.7818
338606 MIDWAY-JD1 69.000			0.9196
338608 MIDWAY-JD2 69.000			0.9196
338618 CLINTON-W1 69.000			0.9058
338681 5HARR-S 161.00		0.8908	
338682 5OSAGE # 161.00	0.9037	0.8429	
338758 5HEBR-N# 161.00		0.8459	0.9115
338813 5MIDWAY# 161.00			0.9196
338814 5SOLAND# 161.00			0.9143
338832 5CLIN-W# 161.00			0.9058
338833 5CLINTON 161.00			0.9163
338834 5BOTKIN# 161.00			0.8991