| | |
|---|---|
| | • Market Operations Testing support for certification – $10,920.<br>• Data Integrity and Analysis ongoing support for ESI ID account registration, extracts, and training - $9,750 |
| Estimated Project Time Requirements*<br>*Unless otherwise indicated, project time requirements begin upon project initiation. | Approximately twenty-nine (29) months |
| ERCOT Staffing Impacts (across all areas) | No long term impact for Energy Analysis and Aggregation<br>No long term impact for Retail Customer Choice<br>No long term impact for Market Operations Testing<br>No long term impact for Data Integrity & Administration |
| ERCOT Computer System Impacts | Impact to the following systems for the addition of ~ 425,000 more ESI IDS, the associated increase in volume for retail transactions on those ESI IDs to support Retail Open Access, including monthly usage data that would be forwarded to REPs.<br><br>Inovis database<br>Siebel database<br>Lodestar database<br>Paperfree database and file system<br>TIBCO database<br>ETS database<br>ISM database<br>Storage<br><br>Limited Data Center Capacity<br>• Already at full capacity<br>• No relief until MET Center Disposition Project delivers more capacity<br>• Potentially not until 4Q2010 or 1Q2011<br>• Means we potentially can't "plug-in" another server until relief is realized |
| ERCOT Business Function Impacts | No long term impact for Energy Analysis and Aggregation<br>No long term impact for Retail Customer Choice<br>No long term impact for Market Operations Testing |

| | |
|---|---|
| | No long term impact for Data Integrity & Administration |
| Grid Operations & Practices Impacts | **None known** |

| Alternatives for a More Efficient Implementation *(include explanation of impacts)* |
|---|
| |

| Evaluation of Interim Solutions *(e.g., manual workarounds)* |
|---|
| |

| Feasibility of Implementation |
|---|
| **Impact on Resource Availability:**<br>Impact on Other Projects: |

| Comments |
|---|
| **This High Level Impact Analysis Report does** NOT **include the following aspects for wholesale or grid/network that were provided in 2006 as part of the Entergy Integration Report (Project No. 32217, *Entergy Gulf States Inc.'s Plan for Identifying Applicable Power Region Pursuant to PURA § 39.452(f)*)**<br><br>Transmission and Distribution Service Provider – **wholesale power transmission connectivity, communication, network modeling, settlement metering and data aggregation.** |

Resources – **registration, setup in ERCOT's network model and data aggregation systems.**

Qualified Scheduling Entities – **registration, telemetry testing, telecommunications, credit, network modeling, scheduling, bidding and deployments.**

Municipal Electric Utilities and Electric Cooperatives – **registration, testing and integration of meter points into ERCOT's metering, data aggregation and settlement systems.**

# Cleco Power - Lafayette Utilities System-
# SPP/SPPICT-Entergy
# Joint Transmission Planning Study

# RELIABILITY AND ECONOMIC STUDY FOR THE 2008 TRANSMISSION EXPANSION PLAN OF THE ACADIANA AREA LOAD POCKET

# October, 2008

## JOINT STUDY GROUP

| Company | Study Representative |
|---|---|
| Cleco Power | Terry Whitmore |
| Cleco Power | Chris Thibodeaux |
| Entergy | Doug Powell |
| Entergy | Joe Payne |
| Entergy | Edin Habibivich |
| LUS | Mike Boustany |
| LUS | Scotty Touchet |
| LUS | Jeff Stewart |
| GDS Associates | John Childes |
| SPPICT | Ben Roubique |
| SPPICT | Jody Holland |
| SPPICT | Bruce Rew |

# Table of Contents

# I. EXECUTIVE SUMMARY

**Study Purpose**
This study examines the reliability issues in the Acadiana Load Pocket and develops a long-term transmission expansion plan for the Acadiana Load Pocket that will benefit all parties in the local area including potential economic benefits. The economic benefits would be in terms of fuel cost savings by providing flexibility of generation within the Acadiana Area Load Pocket. The proposed solutions are designed to bring the load pocket to the point where the area could sustain the loss of a major generating facility and a transmission line.

This study is intended to be a starting point for discussion amongst the affected parties for the expansion of transmission in the Acadiana Load Pocket. The upgrades discussed herein have not been approved, nor is there commitment from any parties to construct these upgrades. The study has not been reviewed or approved by the affected parties.

This study was considered to be a continuation of prior studies including the 2005 Wells Substation addition and evaluate options that will fortify area reliability under N-1 conditions beyond summer 2017. Studies have identified criteria violations within the Acadiana Load Pocket (ALP) in years 2012 and 2017. These criteria violations require some level of Transmission investment within the ALP by 2012. In an effort to eliminate the criteria violations and increase generation flexibility with in the load pocket several transmission expansion projects were looked at. This study compares three options which were evaluated in detail and provides the most relief to the ALP. This study used NERC Planning Standard I.A as a criterion for evaluating numerous analyses and alternative solutions.

**Background Information**
The Acadiana load pocket area encompasses customers of Cleco Power, Lafayette Utilities System (LUS), Entergy Gulf States Louisiana (EGSL), Louisiana Generating (LaGen), and Louisiana Energy and Power Authority (LEPA). The area's total load-serving requirement for 2007 was approximately 1,720 MW. This load-serving requirement is met by local area generation (LUS' Bonin, Hargis, Labbe generating facilities and Cleco's Teche generating facilities) and transmission line thermal capability. This area's projected load in 2017 is approximately 2000 MW

In 2005 Cleco and Entergy combined to finance the construction of Wells Substation which has provided much relief in the form of increasing the import capability into the ALP. Several long term studies have been performed since the incorporation of Wells substation in which the goal of the study was to evaluate both reliability and economics.

The ICT called 125 TLRs in the Acadiana Load Pocket between November, 2006 and November, 2007, 66 of which were called in June and July of 2007. These TLRs were primarily issued on EGSL Cecelia – Moril 138 kV line for the loss of Cleco Power's Flanders – Hopkins 138 kV line and EGSL Scott – Bonin 138 kV line for the loss of LUS Labbe – Bonin 230 kV line. There were 8 TLR Level 5 (firm curtailments) and 43 TLR Level 4 (redispatch generation prior to firm curtailments) events. These TLR events resulted in curtailment of both firm and non-firm transactions, and required redispatch of Cleco Power and LUS generation units in the ALP.

Cleco Power and LUS entered into an agreement in July 27th, 2007 to monitor and adhere to a company specific import limit. By re-dispatching generation to adhere to the import limit has resulted in a reduction of TLR events on the Scott – Bonin 138 kV line. This agreement originally expired on October 31st, 2007, but was extended through December 31st, 2007. Currently the Agreement has been agreed upon for the summer of 2008. This procedure appears to have had a positive effect since to date there have been no TLR Level 5 events issued on Scott – Bonin, and only 3 TLR Level 4 events were called after this agreement was in place. By 2013, this agreement will no longer be able to provide relief as a result of forecasted load growth in the area.

Transmission line maintenance outages have been difficult to obtain, in part due to concerns over the potential for overloads or TLRs on the transmission system with lines out of service. Under certain conditions, it may be necessary for generation to be run in order to grant outages. These concerns can prevent maintenance of

transmission equipment, or cause other parties to bear the cost of running generation in order to support transmission outages.

**Solutions (Options Evaluated)**
There were three (3) options which were given serious consideration as a solution to load pocket issues.

Option I ("Reliability & Economic")

(Reliability Portion)

- Construction of new 230 kV line from Labbe – Bonin (LUS)
- Installation of 500/230 kV auto transformer at Wells (Cleco Power)
- Construction of new 230 kV line from Wells - Labbe (Cleco Power /LUS)
- Construction of new 230 kV line from Labbe - Meaux (EGSL)
- Installation of 230/138 kV auto transformer at Meaux (EGSL)

Attachment B shows Phase I transmission system enhancements proposed in the Acadiana Load Pocket.

(Economic Portion)

- Installation of 500/230 kV auto transformer at Richard (Cleco Power /EGSL)
- Construction of new 230 kV line from Richard – Sellers Road (Cleco Power)
- Construction of new 230 kV substation at Sellers Road to connect Labbe – Meaux and Richard – Sellers Road (Cleco Power)
- Construction of new 230 kV substation at Segura near Moril (Cleco Power)
- Construction of new 230 kV line from Sellers Road – Segura (Cleco Power)
- Installation of 230/138 kV auto transformer at Segura (Cleco Power)
- Construction of new 138 kV line from Segura – Moril (Cleco Power)
- Construction of new 138 kV line terminal at Moril 138 kV substation (EGSL)

Attachment C shows Phases I and II of proposed transmission system enhancements in the Acadiana Load Pocket. The estimated direct total estimated cost of Option I is approximately $200.0 million.

Option II ("ICT Option")

- Construction of new 230 kV transmission line from EGSL's Webre substation - Cecelia
- Construction of new 230 kV substation at Cecelia with a new 230 kV line from Cecelia - Wells and Cecilia - Moril
- Construction of new 230 kV line from Moril - LeBlanc
- Rehabilitating the existing Bonin – Cecelia 138 kV line, Cecelia – Moril 138 kV line, and Moril – Duboin 138 kV line with a new bundled conductor

Attachment D shows the transmission system enhancements in Acadiana Load Pocket for Option II. The estimated direct total cost of Option II is $299 million.

Option III ("Webre & Richard")

- Construction of new 230 kV line from EGSL's Webre substation - Moril
- Construction of new 230 kV station at Richard with a new 230 kV line from Richard - Moril
- Construction of new 230 kV line from Bonin - Meaux
- Construction of new 230 kV sub-station at Sellers Road and tying the 230 kV lines from Moril – Richard and Bonin – Meaux into Sellers Road.

Attachment E shows the transmission system enhancements in the Acadiana Load Pocket for Option III. The estimated direct total cost of Option III is $319 million.

**Recommendation and Conclusion**
Based on the results comparing the three options presented in this report, the best solution for the Acadiana Area is Option I ("Reliability and Economic"). This option is the most cost effective solution, improves reliability beyond 2017, as well as provides generation flexibility within the ALP allowing the system to be operated to N-1, G-1 criteria. More importantly this option provides a way for Cleco Power LLC, Entergy, and Lafayette Utility Services to agree on project responsibilities & ownership while improving reliability & generator flexibility in south Louisiana.

It should be noted that financial investment in this project does not guarantee transmission service or allow for de-commissioning of and generation facilities in the ALP. Additional studies would need to be run with specific source & sink generation dispatch to accommodate such transfers.

# II. OVERVIEW

The Acadiana load pocket area encompasses load served by Cleco Power, Lafayette Utilities System (LUS), Entergy Gulf States, Inc. (EGSI), Louisiana Generating (LaGen), and Louisiana Energy and Power Authority (LEPA). The projected load serving requirements for 2013 for each of these entities are as follows:

| | |
|---|---|
| Cleco Power: | 457 MW plus 246 MW of firm point-to-point |
| LUS: | 523 MW |
| EGSI: | 477 MW plus LaGen's 413 MW (890 MW total) |
| LEPA: | 62 MW |

The total load-serving requirement for this area for 2007 was approximately 1,720 MW. This load-serving requirement is met by local area generation (LUS' Bonin units 1, 2, & 3, Hargis units 1 & 2, Labbe units 1 & 2 and Cleco's Teche units 1, 2, & 3) and transmission line thermal capability (1,429 MVA for Entergy and 1,125 MVA for Cleco). Entergy's transmission tie lines into the load pocket include one 115 kV line and four 138 kV lines. Cleco's transmission tie lines include one 138 kV line and one 230 kV line.

A meeting was held on March 2nd, 2007 in Lafayette with Cleco, Entergy, LEPA, LUS and SPP (representing both the RTO and the ICT) to discuss operational issues in the Acadiana Load Pocket. At this meeting, the ICT presented a prototype expansion plan for the Acadiana Load Pocket. The ICT committed to further develop this plan and present results to the group. The ICT became involved in the planning effort so that an independent entity could review and propose plans, and provide mediation between the parties involved.

The ICT presented its Preliminary Acadiana Load Pocket Reliability Study Report on September 3rd, 2007. In this report, the ICT proposed a transmission expansion plan that involves creating a source on the east side of the load pocket by creating a 230 kV line from the Webre station to Cecelia, and south to Moril. This project was designed to provide for a transmission system that could sustain the loss of a generator and transmission line (Option II "ICT Option"). The estimated cost for this project is $298.6 million.

Following the ICT's report, several follow-up meetings were held to discuss the ICT's plan, and alternative options. At meetings with Cleco, Entergy, LUS and the ICT, additional plans were discussed and three options came out of these discussions. One of the alternatives presented was designed to address N-1 reliability issues on the system. This plan has been termed the "Reliability Option", and consists of a new 230 kV line from Wells to Meaux. In order to address potential savings in fuel cost, the Reliability Option was modified to include an additional 230 kV transmission source which has been named (Option I) "Reliability & Economics Option" to provide better generation flexibility with in the ALP. The third option (Option III) that was considered is the "Webre and Richard Option" which was a combination of the "ICT Option" and the "Reliability & Economic Option". This option like the ICT option provided generation flexibility in the ALP and increased the Webre to Wells operating limit.

Based on the results comparing the three options presented in this report, the best solution for the Acadiana Area is Option I ("Reliability and Economic"). This option is the most cost effective solution, improves reliability beyond 2017, as well as provides generation flexibility within the ALP allowing the system to be operated to N-1, G-1 criteria. More importantly this option provides a way for Cleco Power LLC, Entergy, and Lafayette Utility Services to agree on project responsibilities & ownership while improving reliability & generator flexibility in south Louisiana.

# III. STUDY OBJECTIVE & ASSUMPTIONS

## A. Objective

This study identifies the minimum reliability requirements to be built by the 2012 and 2017 Summer Peak. This study also compares the Options described above for the ALP under different levels of reduced generation within the load pocket. In order to allow for the reduction in generation within the ALP, power transfers from areas far away from the load pocked were performed. This study only monitored elements in or near the ALP and ignored all loading or voltage violations outside of this area. In addition, overloads or voltage violations on 69 kV and below were ignored for the purpose of this study.

**Current Reliability Criteria**

The performance criteria used in this study are consistent with NERC Reliability Standards and are listed below:

- All lines in service
  - Voltage must remain between 0.95 and 1.05 pu. Voltage deviation greater than or equal to 0.03 pu between base case and study model requires an upgrade.
  - MVA flow should not exceed Rate A (Normal rating). Flow increase greater than or equal to 3% between base case and study model requires an upgrade.
- Under contingencies (N-1)
  - Voltage must remain between 0.92 and 1.05 pu. Voltage deviation greater than or equal to 0.03 pu between base case and study model requires an upgrade.
  - MVA flow should not exceed Rate B (Emergency rating). Flow increase greater than or equal to 3% between base case and study model requires an upgrade.

**Future Reliability Criteria**

Due to the limited amount of generation in the load pocket and the potential of wide spread power outages in the Acadiana Load Pocket for loss of a line and a generator, N-1, G-1 criteria was studied. Currently this is above and beyond NERC planning criteria, however in the future this could become standard. Below is the proposed future criteria:

- All lines in service
  - Voltage must remain between 0.95 and 1.05 pu. Voltage deviation greater than or equal to 0.03 pu between base case and study model requires an upgrade.
  - MVA flow should not exceed Rate A (Normal rating). Flow increase greater than or equal to 3% between base case and study model requires an upgrade.
- Under contingencies (N-1, G-1)
  - Voltage must remain between 0.92 and 1.05 pu. Voltage deviation greater than or equal to 0.03 pu between base case and study model requires an upgrade.
  - MVA flow should not exceed Rate B (Emergency rating). Flow increase greater than or equal to 3% between base case and study model requires an upgrade.

## B. Model Details

All results in this analysis are based off of the 2007 set of SPP models. The 2017 summer Peak model has the load within the Acadiana Load Pocket scaled up to 2000 MW. It should be noted that the analysis with in this report is only a fraction of the studies simulated and each party has been given all supporting documentation, load flow cases for which these results are based on. These results are intended to demonstrate to all parties involved which overloads/violations are fixed by the different projects and which overload/violations remain problems under different generation dispatch scenarios (ALP generation dispatch can be found in the Index for each case)

# IV. POWERFLOW RESULTS

## A. 2012 Summer Peak N-1 Criteria Violations

The following elements were loaded over 100%:
Moril to Bayou Warehouse 138 kV line for loss of the Moril to Hopkins 138 kV line
Wells 230/500 kV Auto for loss of the Richard to Wells 500 kV line
Scott to Judice 138 kV line for loss of the Moril to Leblanc 138 kV line
Judice to Meaux 138 kV line for loss of the Moril to Leblanc 138 kV line
Semere to Scott bypass 138 kV line for loss of the Labbe to Bonin 230 kV line
Terrebonne to Greenwoood 115 kV line for loss of Webre Wells 500 kV line
Liviona to Wilbert 138 kV line for loss of Webre Wells 500 kV line
N. Crowley to Scott 138 kV line for loss of the Labbe to Bonin 230 kV line

The following substations were flagged as having voltage below 0.92 pu.:
Col. Academy, Acadia(GSU) and Scanlin for loss of the Richard – Col. Academy 138 kV line
Beadle for loss of Flanders to Beadle 230 kV line
Leroy, Meaux, Delcamb and Abbeville for loss of the Moril to Duboin 138 kV line
Bonin, Semere, Cecelia, Acadiana Mall, Flanders for loss of Labbe to Bonin 230 kV line

## B. 2017 Summer Peak N-1 Criteria Violations

The following elements were loaded over 100%:
Scott to Judice 138 kV line for loss of the Moril to Leblanc 138 kV line
Judice to Meaux 138 kV line for loss of the Moril to Leblanc 138 kV line
Semere to Scott bypass 138 kV line for loss of the Wells to Bonin 230 kV line
Bonin 230/138 kV Auto for loss of the Flanders to Acadiana Mall 230 kV line
Wells 230/500 kV Auto for loss of the Richard to Wells 500 kV line
Terrebonne to Greenwoood 115 kV line for loss of Webre Wells 500 kV line
Scott 138/69 kV Auto #1 for loss of the Scott 138/69 kV Auto #2
Duboin to Bayou Warehouse 138 kV line for loss of the Moril to Hopkins 138 kV line
Bonin 138/69 kV Auto #2 for loss of the Bonin 138/69 kV Auto #1
Scott to Bonin 138 kV line for loss of the Labbe to Bonin 230 kV line
North Crowley to Scott 138 kV line for loss of the Wells to Bonin 230 kV line
Moril to Delcamb 138 kV line for loss of the Scott to Judice 138 kV line
Bonin to Cecelia 138 kV line for loss of the Richard to Col. Academy 138 kV line
Greenwood to Humphrey 115 kV line for loss of Webre Wells 500 kV line
Bonin to Cecelia 138 kV line for loss of the Richard to Col. Academy 138 kV line

The following substations were flagged as having voltage below 0.92 pu.:

Col. Academy, Acadia(GSU) and Scanlin for loss of the Richard – Col. Academy 138 kV line
Beadle for loss of Flanders to Beadle 230 kV line
Leroy, Meaux, Delcamb and Abbeville for loss of the Moril to Duboin 138 kV line

## C. Option I (Reliability Portion)
## 2017 Summer Peak N-1 Criteria Violations

The following elements were loaded over 100%:
Wells 230/500 kV Auto for loss of the Richard to Wells 500 kV line
Terrebonne to Greenwoood 115 kV line for loss of Webre to Wells 500 kV line
Scott 138/69 kV Auto #1 for loss of the Scott 138/69 kV Auto #2

The following substations were flagged as having voltage below 0.92 pu.:
None

## D. Option I (Reliability & Economic Portion)
## 2017 Summer Peak N-1 G-1Criteria Violations (Teche Unit 3 Off)

The following elements were loaded over 100%:
Terrebonne to Greenwoood 115 kV line for loss of Webre to Wells 500 kV line
Greenwood to Humphry 115 kV line for loss of Webre to Wells 500 kV line
Humphry to Gibson 115 kV line for loss of Webre to Wells 500 kV line
Liviona to Wilbert 138 kV line for loss of Webre to Wells 500 kV line
Gibson to Ramos 138kV line for loss of Webre to Wells 500 kV line
*Scott 138/69 kV Auto #1 for loss of the Scott 138/69 kV Auto #2
*Bonin to Cecelia 138 kV line for loss of the Richard to Col. Academy 138 kV line

The following substations were flagged as having voltage below 0.92 pu.:
None

*Local Area Problem

## E. Option I (Reliability & Economic Portion)
## 2017 Summer Peak N-1, G-2 Criteria Violations (Teche & Bonin Off)

The following elements were loaded over 100%:
Terrebonne to Greenwoood 115 kV line for loss of Webre to Wells 500 kV line
Greenwood to Humphry 115 kV line for loss of Webre to Wells 500 kV line
Humphry to Gibson 115 kV line for loss of Webre to Wells 500 kV line
Gibson to Ramos 138kV line for loss of Webre to Wells 500 kV line
Liviona to Wilbert 138 kV line for loss of Webre to Wells 500 kV line
Scott 138/69 kV Auto #1 for loss of the Scott 138/69 kV Auto #2

The following substations were flagged as having voltage below 0.92 pu.:
Teche 138 kV bus with all lines in service
Teche 138 kV bus for an outage on the Webre to Wells 500 kV line

## F. Option I (Reliability & Economic Portion)
## 2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off)

The following elements were loaded over 100%:
Terrebonne to Greenwoood 115 kV line for loss of Webre to Wells 500 kV line
Greenwood to Humphry 115 kV line for loss of Webre to Wells 500 kV line
Humphry to Gibson 115 kV line for loss of Webre to Wells 500 kV line
Liviona to Wilbert 138 kV line for loss of Webre to Wells 500 kV line
Gibson to Ramos 138kV line for loss of Webre to Wells 500 kV line
Scott 138/69 kV Auto #1 for loss of the Scott 138/69 kV Auto #2
Cocodrie to Ville Platte 230 kV line for loss of Webre to Wells 500 kV line
Acadiana Mall to Bonin 230 kV line for loss of Webre to Wells 500 kV line

The following substations were flagged as having voltage below 0.92 pu.:
Greenwood, Ramos, Semere, Judice, Leblanc, Scott, Leroy, Meaux, Moril, Delcambe, Abbville, Duboin, Bayou Warehouse, Cecelia, Humphry, Gibson, BelPlace, Bayou Sale, Bayou Vista, Berwick, El Paso, Flanders, Hopkins, Ivanhoe, Julien, Meaux, Morbihan, North Bend, Patoutville, Segura, Sellers Rd, Teche, Wax Lake, Acadiana Mall, Bonin, Elks, Labbe, Beadle for loss of the Webre to Wells 500 kV line
Beadle for loss of Flanders to Beadle 230 kV line

## G. Option II (ICT Option)
## 2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off)

The following elements were loaded over 100%:
Scott to Bonin 138 kV line for loss of Wells to Pont Des Mouton 230 kV line
Webre to Cecelia 230 kV line for loss of Webre to Wells 500 kV line
Bonin 230/69 kV Auto for loss of Acadiana to Bonin 230 kV line

The following substations were flagged as having voltage below 0.92 pu.:
Col. Academy, Acadia(GSU) and Scanlin for loss of the Richard – Col. Academy 138 kV line
Champagne for loss of the Coughlin to Plaisance 138 kV line
Leroy, Meaux, Delcamb and Abbeville for loss of the Scott to Judice 138 kV line
Cecelia for loss of the Cecelia 230/138 kV Auto
Breaux Bridge for loss of the Flanders to Beadle 230 kV line
Habetz for loss of the Richard to Habetz 138 kV line
Flanders for loss of the Wells to Pont Des Mouton 230 kV line
Moril with all lines in service

## H. Option III (Webre & Richard)
## 2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off)

The following elements were loaded over 100%:
Terrebonne to Greenwoood 115 kV line for loss of Webre Wells 500 kV line
Webre 500/230 kV Auto for loss of the Webre to Wells 500 kV line
Bonin 230/69 kV Auto for loss of Bonin 230/138 kV Auto

The following substations were flagged as having voltage below 0.92 pu.:
Col. Academy, Acadia(GSU) and Scanlin for loss of the Richard – Col. Academy 138 kV line
Champagne for loss of the Coughlin to Plaisance 138 kV line
Leroy, Meaux, Delcamb and Abbeville for loss of the Wells to Pont Des Mouton 230 kV line
Duboin, Cecelia, Breaux Bridge for loss of the Wells to Pont Des Mouton 230 kV line
Habetz for loss of the Richard to Habetz 138 kV line
Hopkins, Flanders, Nickerson for loss of the Wells to Pont Des Mouton 230 kV line
Sellers Rd. and BoninByPass for loss of the Wells to Pont Des Mouton 230 kV line

# VIII. RECOMMENDATION

Currently the Acadiana Load Pocket depends on transmission system and 30 to 40 year old natural gas fired local generation to provide reliability for the load pocket year round. It is the recommendation of this group that a transmission project be constructed to improve import capability into the Acadiana Load Pocket in order to reduce the dependence on local generation within the load pocket and furthermore plan the ALP to a higher criteria standard on N-1, G-1 to insure reliability for the foreseeable future. The "Reliability & Economic", "ICT", and "Webre & Richard" options all meet the recommended standard of planning the system to N-1, G-1. Only the "Reliability and Economic" option provides an agreeable way to split up the project responsibilities in an equitable manner among Cleco Power LLC, Entergy, and Lafayette Utility Services. So it is the recommendation of this study for the "Reliability and Economic" option to be built.

Due to the dynamic nature of this industry and uncertainty of future generation dispatch this area will continue to need to be planned jointly with close interaction among transmission owners in the ALP.

# IX. CONCLUSION

The recommendation of this study is to construct the "Reliability and Economic" project among Cleco Power, Entergy, and Lafayette. This report is final and a Memorandum of Understanding has been signed by all parties.

# Attachment A. Model Generation Dispatch

| Bus Number | Bus Name | Id | A 12SP Pgen (MW) | B 17SP Pgen (MW) | C 17SP Pgen (MW) | D 17SP Pgen (MW) | E 17SP Pgen (MW) | F 17SP Pgen (MW) | G 17SP Pgen (MW) | H 17SP Pgen (MW) |
|---|---|---|---|---|---|---|---|---|---|---|
| 501812 | G2RODEMR 22.000 | 1 | 525 | 525 | 525 | 525 | 525 | 525 | 525 | 525 |
| 501821 | G1TECHE 13.800 | 1 | 23 | 23 | 23 | 23 | 0 | 0 | 0 | 0 |
| 501822 | G2TECHE 13.200 | 1 | 48 | 48 | 48 | 48 | 0 | 0 | 0 | 0 |
| 501823 | G3TECHE 24.000 | 1 | 318 | 325 | 325 | 0 | 0 | 0 | 0 | 0 |
| 501910 | G1 ACAD 18.000 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 501911 | G1-1ACAD 18.000 | 1 | 125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 501912 | G1-2ACAD 18.000 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 501920 | G2 ACAD 18.000 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 501921 | G2-1ACAD 18.000 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 501922 | G2-2ACAD 18.000 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 502433 | LABBE1 13.800 | 1 | 21 | 50 | 50 | 50 | 50 | 0 | 0 | 0 |
| 502434 | LABBE2 13.800 | 1 | 48 | 50 | 50 | 50 | 50 | 0 | 0 | 0 |
| 502435 | HARGIS1 13.800 | 1 | 50 | 50 | 50 | 50 | 50 | 0 | 0 | 0 |
| 502436 | HARGIS2 13.800 | 1 | 50 | 50 | 50 | 50 | 50 | 0 | 0 | 0 |
| 502437 | BONIN3 20.000 | 1 | 0 | 127 | 127 | 127 | 0 | 0 | 0 | 0 |
| 502438 | BONIN2 13.800 | 1 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 502439 | BONIN1 13.800 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 503301 | MRGNCTY4 138.00 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 503301 | MRGNCTY4 138.00 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 503301 | MRGNCTY4 138.00 | 3 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| 503301 | MRGNCTY4 138.00 | 4 | 36 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |

# EGSI-LA Breaker Upgrades

**Scenario:**

- Based on asymmetrical fault current analysis, various circuit breakers have been identified as underrated.

**Recommended Solution:**

- Replace the identified underrated circuit breakers with appropriately sized breakers. (List in order of priority)
  - **Mossville 138kV # 17970**
  - **Scott 138kV #'s 8820, 17100 & 8825**
  - **Carlyss 69kV #'s 7840 & 8775**
  - **Nelson 138kV # 7990**
  - **Coly 69kV #'s 20375, 20365 & 20370**
  - **Esso 230kV #'s 20080, 20085, 20090**
  - **Nelson 230kV # 27105**
  - **Scott 69kV # 8860**

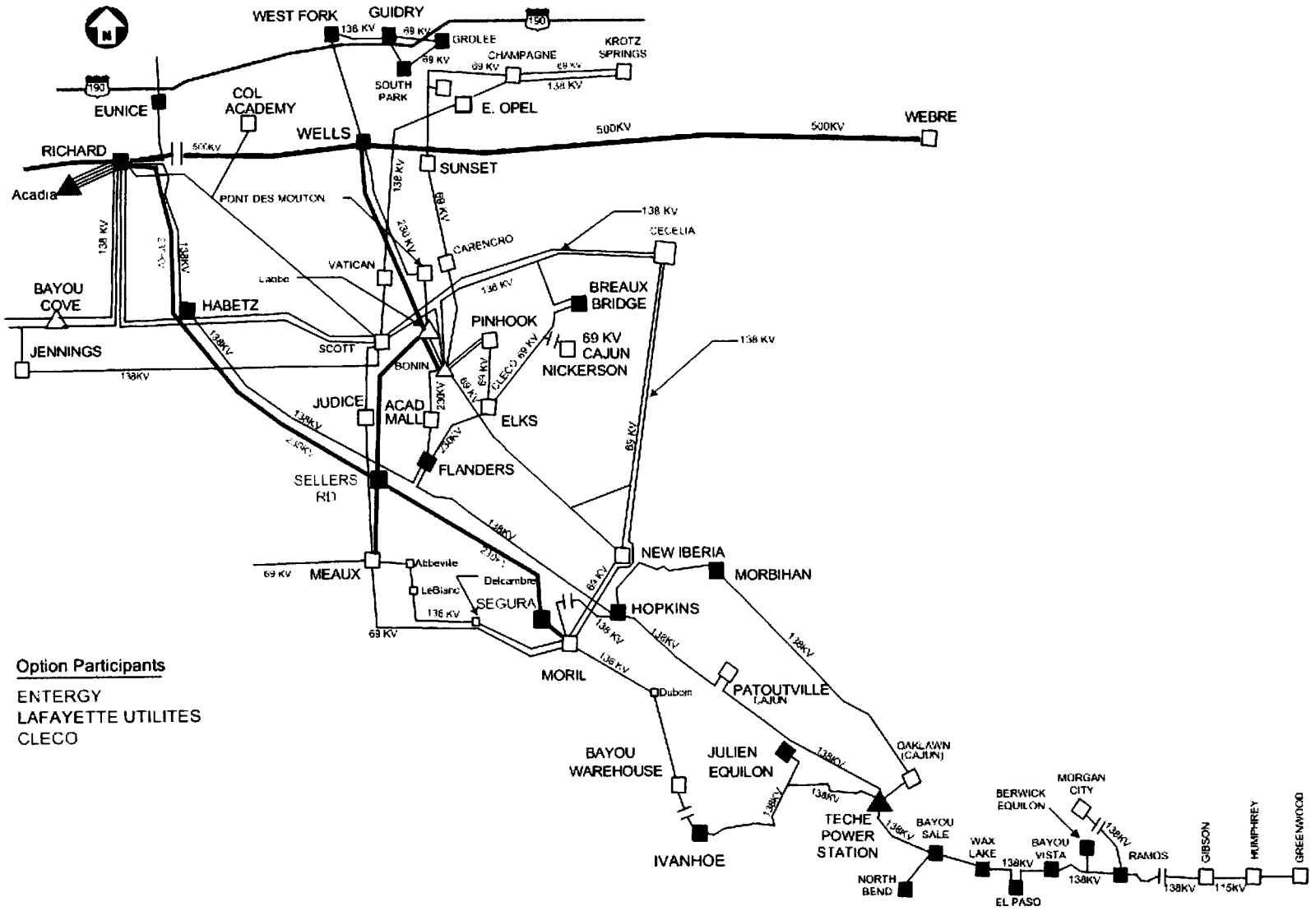
Entergy

**Descriptions:** This project eliminates the ALP's N-1 criteria violations in 2017.
**Construction:**

-Build a New Meaux 230 kV Substation with a 230/138 kV Auto connected to the Meaux 138 kV station
-Build a New 230 kV line from Wells to Meaux using mostly existing ROW
-Build a New 230 kV line from Labbe to Bonin using existing ROW
Add new Capacitor Banks at Meaux(36 MVAR), Leblanc(72 MVAR), and Acadia(GSU)(36 MVAR).

**Estimated Cost:** $71,891,000

# Attachment C. Reliability & Economic Project detail



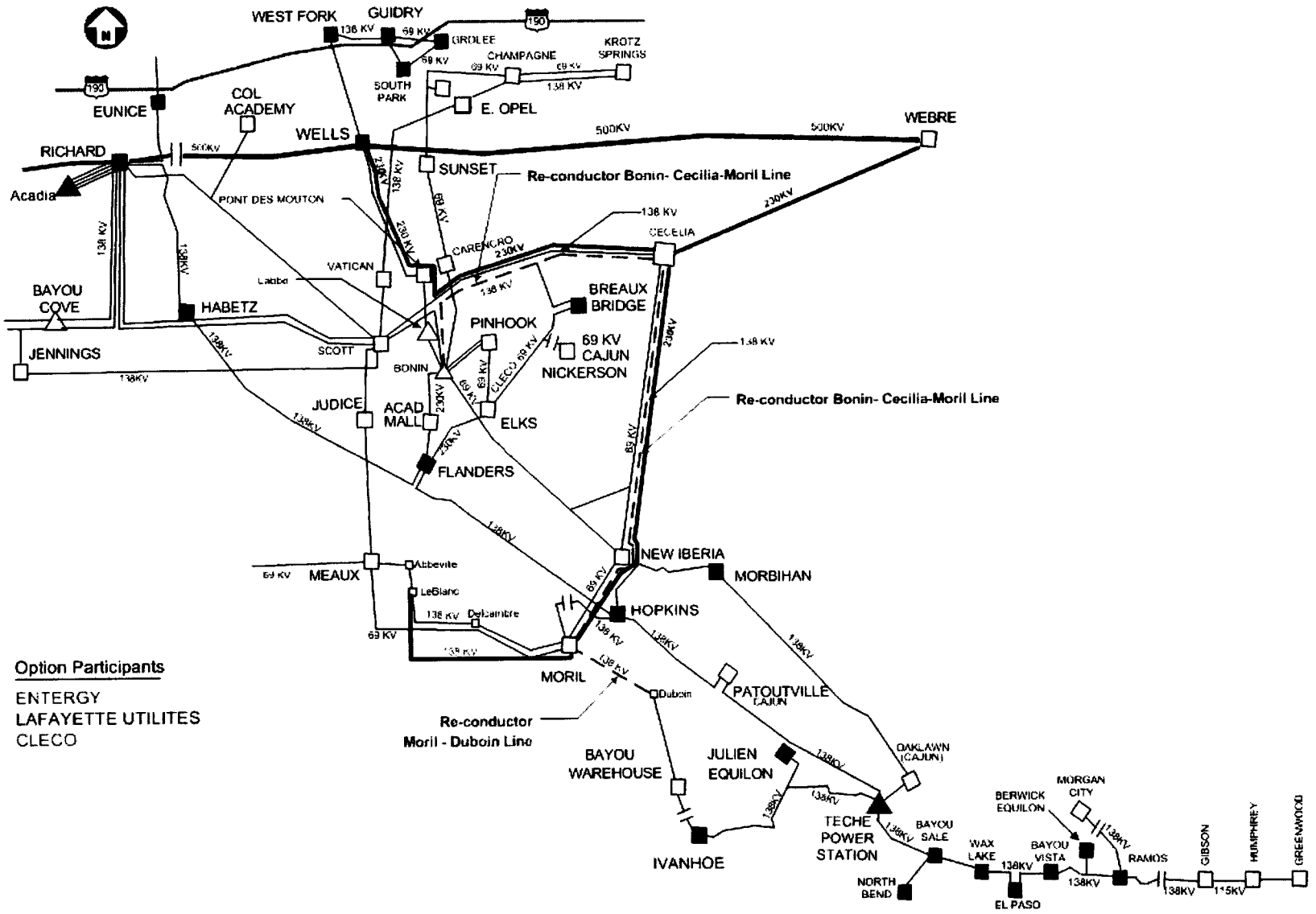
**Descriptions:** This project eliminates the ALP's N-1, G-1 criteria violations in 2017 which are not local area problems. This project also gives Cleco and LUS more generation flexibility in the ALP.

**Construction:**

-Build a New Meaux 230 kV Substation with a 230/138 kV Auto connected to the Meaux 138 kV station
-Build a New Richard 230 kV Substation with a 500/230 kV Auto connected to the Richard 500 kV station
-Build a New Segura 230 kV Substation with a 230/138 kV Auto connected to the Moril 138 kV station
-Build a New Sellers Rd. 230 kV Substation where the Wells to Meaux 230 kV line crosses the Habetz to Flanders 138 kV line
-Build a New 230 kV line from Wells to Labbe using mostly existing ROW
-Build a New 230 kV line from Labbe to Sellers Rd using existing ROW
-Build a New 230 kV line from Sellers Rd to Meaux using existing ROW
-Build a New 230 kV line from Sellers Rd to Segura using existing ROW
-Build a New 230 kV line from Richard to Sellers Rd using existing ROW
-Build a New 230 kV line from Labbe to Bonin using existing ROW
-Add a Second Wells 500/230 kV Auto
-Add a New 230/138 kV Auto and 138/69 kV Auto at Bonin
-Add Capacitor Banks at Acadia(GSU)(36), Cecelia(36), Scott(36), Meaux(18), Ramos(36), Beadle(36) and Leblanc(36) MVARS*

**Estimated Cost:** $200,000,000

# Attachment D. ICT Option Project detail



**Descriptions:** This project eliminates the ALP's N-1, G-1 criteria violations in 2017. This project also gives Cleco and LUS more generation flexibility in the ALP. This project also increases the amount of power that can be generated East of the Atchafalaya basin and/or reduces the must run requirements on Entergy generation West of the Atchafalaya basin. This provides more flexibility for Entergy and Entergy customers by greatly reducing the Webre to Wells operating limit on the Webre to Wells line.

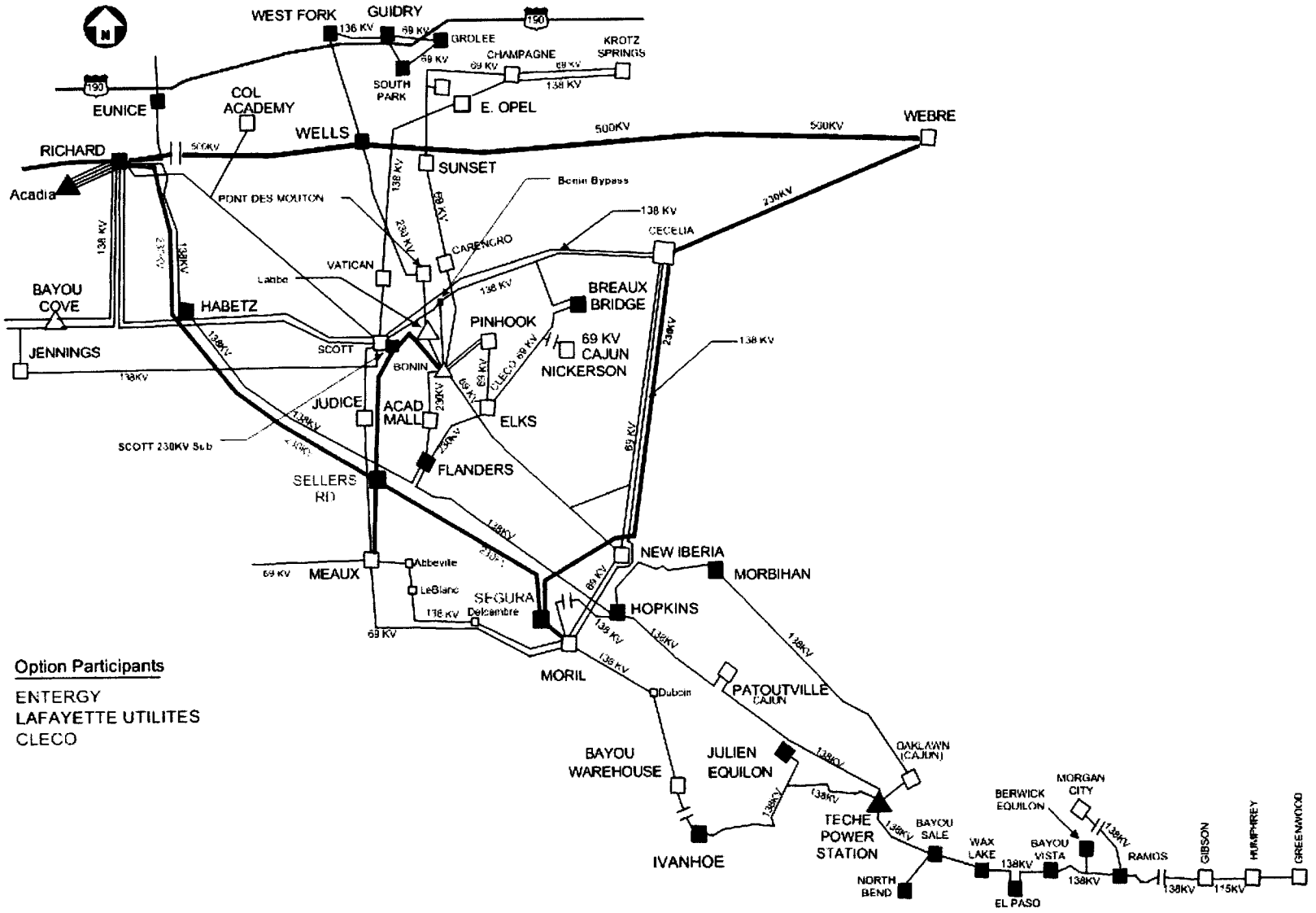
**Construction:**

-Build a New Webre 230 kV Substation with a 500/230 kV Auto connected to the Webre 500 kV station
-Build a New Cecelia 230 kV Substation with a 230/138 kV Auto connected to the Cecelia 138 kV station
-Build a New Moril 230 kV Substation with a 230/138 kV Auto connected to the Moril 138 kV station
-Build a New 230 kV line from Webre to Cecelia using existing ROW
-Build a New 230 kV line from Cecelia to Wells using existing ROW
-Build a New 230 kV line from Cecelia to Moril using existing ROW
-Build a New 138 kV line from Moril to Leblanc using existing ROW
-Re-conductor the existing 138 kV line from Cecelia to Moril
-Re-conductor the existing 138 kV line from Cecelia to Bonin
-Re-conductor the existing 138 kV line from Moril to Duboin
-Add Capacitor Banks at Col. Academy(36), Meaux(36), Ramos(36) and Leblanc(72) MVARS*
-New Bonin 230/69 kV Auto**
-2nd Wells 500/230 kV Auto**
-2nd Webre 500/230 kV Auto**
-New Cecelia 230/69 kV Auto**

**Estimated Cost:** $299,000,000

*More Capacitor banks could be needed to fix other violations in the Powerflow results.
** Projects are not included in the price estimate

# Attachment E. Webre – Richard Project detail



**Descriptions:** This project eliminates the ALP's N-1, G-1 criteria violations in 2017. This project also gives Cleco and LUS more generation flexibility in the ALP. This project also increases the amount of power that can be generated East of the Atchafalaya basin and/or reduces the must run requirements on Entergy generation West of the Atchafalaya basin. This provides more flexibility for Entergy and Entergy customers by greatly reducing the Webre to Wells operating limit on the Webre to Wells line.

**Construction:**

-Build a New Webre 230 kV Substation with a 500/230 kV Auto connected to the Webre 500 kV station
-Build a New Cecelia 230 kV Substation (optional)
-Build a New Scott 230 kV Substation with a 230/69 kV Auto connected to the Scott 69 kV station
-Build a New Meaux 230 kV Substation with a 230/138 kV Auto connected to the Meaux 138 kV station
-Build a New Richard 230 kV Substation with a 500/230 kV Auto connected to the Richard 500 kV station
-Build a New Segura 230 kV Substation with a 230/138 kV Auto connected to the Moril 138 kV station
-Build a New Sellers Rd. 230 kV Substation where the Scott to Meaux 230 kV line crosses the Habetz to Flanders 138 kV line
-Build a New 230 kV line from Webre to Cecelia using existing ROW
-Build a New 230 kV line from Cecelia to Segura using existing ROW
-Build a New 230 kV line from Scott to Sellers Rd using existing ROW
-Build a New 230 kV line from Sellers Rd to Meaux using existing ROW
-Build a New 230 kV line from Sellers Rd to Segura using existing ROW
-Build a New 230 kV line from Richard to Sellers Rd using existing ROW
-Build a New switching station where the Scott to Bonin and the Bonin to Cecelia 138 kV lines turn south near Labbe. Eliminate one of the 138 kV lines between this new switching station and Bonin to make room for a new 230 kV line into Bonin.
-Build a New 230 kV line from Scott to Bonin using existing ROW
-Add a New 230/69 kV Auto at Bonin
-Add Capacitor Banks at Col. Academy(36), Cecelia(36), Scott(36), Meaux(36), Ramos(36) and Leblanc(72) MVARS

**Estimated Cost:** $319,000,000

*More Capacitor banks could be needed to fix other violations in the Powerflow results.

# Attachment F. Powerflow Results

## 2012 Summer Peak N-1 Criteria Violations

| ** From bus ** | ** To bus ** | CKT | Contingency | Loading % |
|---|---|---|---|---|
| 98184 4DUBOIN 138 | 98185 4BUWHSE 138 | 1 | 98177 4MORIL 138 500410 HOPKINS4 138 1 | 123.3 |
| 98109 8WELLS 500 | 500950 WELSRCT6 230 | 1 | 98107 8RICHARD 500 98109 8WELLS 500 1 | 120 |
| 97324 4JUDICE 138 | 98130 4SCOTT 138 | 1 | 98177 4MORIL 138 98178 4DELCAMB 138 1 | 111.5 |
| 97324 4JUDICE 138 | 98160 4MEAUX 138 | 1 | 98177 4MORIL 138 98178 4DELCAMB 138 1 | 109.4 |
| 97324 4JUDICE 138 | 98130 4SCOTT 138 | 1 | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 | 103.7 |
| 97323 4SEMERE 138 | 98113 4SCOTT2 138 | 1 | 502403 BONIN 6 230 502421 LABBE 230 1 | 102.9 |
| 98410 4LIVON 138 | 98411 4WILBT 138 | 1 | 98109 8WELLS 500 98430 8WEBRE 500 1 | 102.9 |
| 97309 3GRENWD 115 | 98522 3TEREBN 115 | 1 | 98109 8WELLS 500 98430 8WEBRE 500 1 | 101 |
| 97329 4NCROWL 138 | 98130 4SCOTT 138 | 1 | 502403 BONIN 6 230 502421 LABBE 230 1 | 100.8 |
| 98177 4MORIL 138 | 98184 4DUBOIN 138 | 1 | 98177 4MORIL 138 500410 HOPKINS4 138 1 | 100.7 |
| 98130 4SCOTT 138 | 502404 BONIN 4 138 | 1 | 502403 BONIN 6 230 502421 LABBE 230 1 | 99.8 |
| 97324 4JUDICE 138 | 98160 4MEAUX 138 | 1 | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 | 99.6 |
| 98185 4BUWHSE 138 | 500440 IVANHOE4 138 | 1 | 98177 4MORIL 138 500410 HOPKINS4 138 1 | 99.4 |
| 98177 4MORIL 138 | 98178 4DELCAMB 138 | 1 | 97324 4JUDICE 138 98130 4SCOTT 138 1 | 98.5 |
| 502403 BONIN 6 230 | 502404 BONIN 4 138 | 1 | 502402 ACADIAN6 230 502403 BONIN 6 230 1 | 98.1 |
| 98130 4SCOTT 138 | 98131 2SCOTT 69.0 | 2 | 98130 4SCOTT 138 98131 2SCOTT 69.0 1 | 95.7 |
| 98130 4SCOTT 138 | 98131 2SCOTT 69.0 | 1 | 98130 4SCOTT 138 98131 2SCOTT 69.0 2 | 95.7 |
| 97323 4SEMERE 138 | 98113 4SCOTT2 138 | 1 | 500940 WELLS 230 502410 PMOUTON6 230 1 | 95.5 |

## 2017 Summer Peak N-1 Criteria Violations

| ** From bus ** | ** To bus ** | CKT | Contingency | Loading % |
|---|---|---|---|---|
| 97324 4JUDICE 138 | 98130 4SCOTT 138 | 1 | 98177 4MORIL 138 98178 4DELCAMB 138 1 | 125 |
| 97324 4JUDICE 138 | 98160 4MEAUX 138 | 1 | 98177 4MORIL 138 98178 4DELCAMB 138 1 | 123.6 |
| 97323 4SEMERE 138 | 98113 4SCOTT2 138 | 1 | 502403 BONIN 6 230 502421 LABBE 230 1 | 118.5 |
| 500190 COCODR 6 230 | 500230 COUGH 4 138 | 1 | 500190 COCODR 6 230 500880 VILPLT 6 230 1 | 117.1 |
| 97324 4JUDICE 138 | 98130 4SCOTT 138 | 1 | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 | 115.5 |
| 502403 BONIN 6 230 | 502404 BONIN 4 138 | 1 | 502402 ACADIAN6 230 502403 BONIN 6 230 1 | 114.9 |
| 98109 8WELLS 500 | 500950 WELSRCT6 230 | 1 | 98107 8RICHARD 500 98109 8WELLS 500 1 | 114.8 |
| 97309 3GRENWD 115 | 98522 3TEREBN 115 | 1 | 98109 8WELLS 500 98430 8WEBRE 500 1 | 114 |
| 98130 4SCOTT 138 | 98131 2SCOTT 69.0 | 2 | 98130 4SCOTT 138 98131 2SCOTT 69.0 1 | 113 |
| 98130 4SCOTT 138 | 98131 2SCOTT 69.0 | 1 | 98130 4SCOTT 138 98131 2SCOTT 69.0 2 | 113 |
| 97324 4JUDICE 138 | 98160 4MEAUX 138 | 1 | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 | 112.9 |
| 97323 4SEMERE 138 | 98113 4SCOTT2 138 | 1 | 500940 WELLS 230 502410 PMOUTON6 230 1 | 112.2 |
| 98184 4DUBOIN 138 | 98185 4BUWHSE 138 | 1 | 98177 4MORIL 138 500410 HOPKINS4 138 1 | 112 |
| 502404 BONIN 4 138 | 502405 BONIN 2 69.0 | 2 | 502401 FLANDER6 230 502425 BEADLE 6 230 1 | 111 |
| 98130 4SCOTT 138 | 502404 BONIN 4 138 | 1 | 502403 BONIN 6 230 502421 LABBE 230 1 | 110.9 |
| 500190 COCODR 6 230 | 500230 COUGH 4 138 | 1 | 500880 VILPLT 6 230 500920 WSTFORK6 230 1 | 110.3 |
| 97329 4NCROWL 138 | 98130 4SCOTT 138 | 1 | 502403 BONIN 6 230 502421 LABBE 230 1 | 110 |
| 97323 4SEMERE 138 | 98113 4SCOTT2 138 | 1 | 502410 PMOUTON6 230 502421 LABBE 230 1 | 108.3 |
| 98177 4MORIL 138 | 98178 4DELCAMB 138 | 1 | 97324 4JUDICE 138 98130 4SCOTT 138 1 | 107.9 |
| 98190 4CECELIA 138 | 502404 BONIN 4 138 | 1 | 98108 4RICHARD 138 98110 4COLACDY 138 1 | 106.9 |
| 502404 BONIN 4 138 | 502405 BONIN 2 69.0 | 1 | 502401 FLANDER6 230 502425 BEADLE 6 230 1 | 106.6 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 502404 | BONIN | 4 | 138 | 502405 | BONIN | 2 | 69.0 | 2 | 502404 BONIN 4 | 138 | 502405 | BONIN 2 | 69.0 1 | 105.9 |
| 502404 | BONIN | 4 | 138 | 502405 | BONIN | 2 | 69.0 | 1 | 502404 BONIN 4 | 138 | 502405 | BONIN 2 | 69.0 2 | 105.3 |
| 97329 | 4NCROWL | | 138 | 98130 | 4SCOTT | | 138 | 1 | 500940 WELLS | 230 | 502410 | PMOUTON6 | 230 1 | 104.6 |
| 502403 | BONIN | 6 | 230 | 502404 | BONIN | 4 | 138 | 1 | 502401 FLANDER6 | 230 | 502402 | ACADIAN6 | 230 1 | 104.6 |
| 98190 | 4CECELIA | | 138 | 502404 | BONIN | 4 | 138 | 1 | 98110 4COLACDY | 138 | 98111 | 4ACADGSU | 138 1 | 102.4 |
| 97324 | 4JUDICE | | 138 | 98130 | 4SCOTT | | 138 | 1 | 500820 TECHE 4 | 138 | 501823 | G3TECHE | 24.0 1 | 101.5 |
| 97329 | 4NCROWL | | 138 | 98130 | 4SCOTT | | 138 | 1 | 502410 PMOUTON6 | 230 | 502421 | LABBE | 230 1 | 101 |
| 97309 | 3GRENWD | | 115 | 98520 | 3HUMPHY | | 115 | 1 | 98109 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | 100.5 |
| 98190 | 4CECELIA | | 138 | 502404 | BONIN | 4 | 138 | 1 | 98111 4ACADGSU | 138 | 98112 | 4SCANLN | 138 1 | 100.1 |
| 500190 | COCODR | 6 | 230 | 500230 | COUGH | 4 | 138 | 1 | 500920 WSTFORK6 | 230 | 500940 | WELLS | 230 1 | 100 |
| 500820 | TECHE | 4 | 138 | 500830 | TECHE | 1 | 34.5 | 1 | 500820 TECHE 4 | 138 | 500830 | TECHE 1 | 34.5 2 | 99.7 |
| 502404 | BONIN | 4 | 138 | 502405 | BONIN | 2 | 69.0 | 2 | 502402 ACADIAN6 | 230 | 502403 | BONIN 6 | 230 1 | 99.6 |
| 98520 | 3HUMPHY | | 115 | 98521 | 3GIBSON | | 115 | 1 | 98109 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | 99.4 |
| 98410 | 4LIVON | | 138 | 98411 | 4WILBT | | 138 | 1 | 98109 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | 98.7 |
| 98130 | 4SCOTT | | 138 | 98131 | 2SCOTT | | 69.0 | 1 | 97324 4JUDICE | 138 | 98130 | 4SCOTT | 138 1 | 98.7 |
| 98130 | 4SCOTT | | 138 | 98131 | 2SCOTT | | 69.0 | 2 | 97324 4JUDICE | 138 | 98130 | 4SCOTT | 138 1 | 98.7 |
| 97330 | 4LEBLAN | | 138 | 98178 | 4DELCAMB | | 138 | 1 | 97324 4JUDICE | 138 | 98130 | 4SCOTT | 138 1 | 98.2 |
| 98108 | 4RICHARD | | 138 | 98110 | 4COLACDY | | 138 | 1 | 502403 BONIN 6 | 230 | 502421 | LABBE | 230 1 | 98.1 |
| 98130 | 4SCOTT | | 138 | 502404 | BONIN | 4 | 138 | 1 | 500940 WELLS | 230 | 502410 | PMOUTON6 | 230 1 | 97.1 |
| 502403 | BONIN | 6 | 230 | 502421 | LABBE | | 230 | 1 | 98107 8RICHARD | 500 | 98109 | 8WELLS | 500 1 | 96.9 |
| 98108 | 4RICHARD | | 138 | 500400 | HABETZ | 4 | 138 | 1 | 502403 BONIN 6 | 230 | 502421 | LABBE | 230 1 | 96.7 |
| 502404 | BONIN | 4 | 138 | 502405 | BONIN | 2 | 69.0 | 2 | 502413 ELKS 2 | 69.0 | 502417 | ELKS 6 | 230 1 | 96.5 |
| 502404 | BONIN | 4 | 138 | 502405 | BONIN | 2 | 69.0 | 2 | 502417 ELKS 6 | 230 | 502425 | BEADLE 6 | 230 1 | 96.5 |
| 502404 | BONIN | 4 | 138 | 502405 | BONIN | 2 | 69.0 | 1 | 502402 ACADIAN6 | 230 | 502403 | BONIN 6 | 230 1 | 96 |
| 500190 | COCODR | 6 | 230 | 500230 | COUGH | 4 | 138 | 1 | 98107 8RICHARD | 500 | 98109 | 8WELLS | 500 1 | 95.8 |
| 502401 | FLANDER6 | | 230 | 502402 | ACADIAN6 | | 230 | 1 | 98107 8RICHARD | 500 | 98109 | 8WELLS | 500 1 | 95.8 |
| 502401 | FLANDER6 | | 230 | 502402 | ACADIAN6 | | 230 | 1 | 502403 BONIN 6 | 230 | 502404 | BONIN 4 | 138 1 | 95.6 |
| 97324 | 4JUDICE | | 138 | 98160 | 4MEAUX | | 138 | 1 | 500820 TECHE 4 | 138 | 501823 | G3TECHE | 24.0 1 | 95.4 |
| 98108 | 4RICHARD | | 138 | 98130 | 4SCOTT | | 138 | 1 | 502403 BONIN 6 | 230 | 502421 | LABBE | 230 1 | 95.4 |
| 98176 | 2MORIL | | 69.0 | 98177 | 4MORIL | | 138 | 1 | 98177 4MORIL | 138 | 98178 | 4DELCAMB | 138 1 | 95.1 |

## 2017 Summer Peak N-1 Criteria Violations (Reliability Upgrade)

| ** From bus | | ** | ** To bus | | ** | CKT | | Contingency | | | | Loading % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98109 | 8WELLS | 500 | 500950 | WELSRCT6 | 230 | 1 | | 98107 8RICHARD | 500 | 98109 | 8WELLS | 500 1 | 127.3 |
| 500190 | COCODR | 6 230 | 500230 | COUGH | 4 | 138 | 1 | 500190 COCODR 6 | 230 | 500880 | VILPLT | 6 230 1 | 115.7 |
| 500190 | COCODR | 6 230 | 500230 | COUGH | 4 | 138 | 1 | 500880 VILPLT 6 | 230 | 500920 | WSTFORK6 | 230 1 | 108.9 |
| 97309 | 3GRENWD | 115 | 98522 | 3TEREBN | | 115 | 1 | 98109 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | 107.9 |
| 98109 | 8WELLS | 500 | 500950 | WELSRCT6 | 230 | 1 | | 500190 COCODR 6 | 230 | 500880 | VILPLT | 6 230 1 | 102 |
| 98130 | 4SCOTT | 138 | 98131 | 2SCOTT | 69.0 | 2 | | 98130 4SCOTT | 138 | 98131 | 2SCOTT | 69.0 1 | 101.4 |
| 98130 | 4SCOTT | 138 | 98131 | 2SCOTT | 69.0 | 1 | | 98130 4SCOTT | 138 | 98131 | 2SCOTT | 69.0 2 | 101.4 |
| 500820 | TECHE | 4 138 | 500830 | TECHE | 1 | 34.5 | 1 | 500820 TECHE 4 | 138 | 500830 | TECHE | 1 34.5 2 | 99.7 |
| 500190 | COCODR | 6 230 | 500230 | COUGH | 4 | 138 | 1 | 500920 WSTFORK6 | 230 | 500940 | WELLS | 230 1 | 98.6 |
| 98109 | 8WELLS | 500 | 500950 | WELSRCT6 | 230 | 1 | | 500880 VILPLT 6 | 230 | 500920 | WSTFORK6 | 230 1 | 96.9 |
| 98410 | 4LIVON | 138 | 98411 | 4WILBT | 138 | 1 | | 98109 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | 96.6 |

## 2017 Summer Peak N-1 G-1Criteria Violations (Teche Unit 3) (Reliability & Economic Upgrade)

| ** From bus | ** | ** To bus | ** | CKT | Contingency | | | | | Loading % |
|---|---|---|---|---|---|---|---|---|---|---|
| 97309 3GRENWD | 115 | 98522 3TEREBN | 115 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 141.9 |
| 97309 3GRENWD | 115 | 98520 3HUMPHY | 115 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 127.6 |
| 98520 3HUMPHY | 115 | 98521 3GIBSON | 115 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 126.5 |
| 98410 4LIVON | 138 | 98411 4WILBT | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 109.3 |
| 98572 4GIBSON | 138 | 500740 RAMOS 4 | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 108.5 |
| 98130 4SCOTT | 138 | 98131 2SCOTT | 69.0 | 1 | 98130 4SCOTT | 138 | 98131 2SCOTT | 69.0 | 2 | 104.8 |
| 98130 4SCOTT | 138 | 98131 2SCOTT | 69.0 | 2 | 98130 4SCOTT | 138 | 98131 2SCOTT | 69.0 | 1 | 104.8 |
| 98190 4CECELIA | 138 | 502404 BONIN 4 | 138 | 1 | 98108 4RICHARD | 138 | 98110 4COLACDY | 138 | 1 | 100.1 |
| 98147 4L-642TP | 138 | 98410 4LIVON | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 97.2 |
| 98190 4CECELIA | 138 | 502404 BONIN 4 | 138 | 1 | 98110 4COLACDY | 138 | 98111 4ACADGSU | 138 | 1 | 96.7 |
| 98521 3GIBSON | 115 | 98572 4GIBSON | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 95.8 |
| 97318 4KSPRGS | 138 | 98147 4L-642TP | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 95.5 |
| 98190 4CECELIA | 138 | 502404 BONIN 4 | 138 | 1 | 98111 4ACADGSU | 138 | 98112 4SCANLN | 138 | 1 | 95.1 |

## 2017 Summer Peak N-1 G-2Criteria Violations (Teche & Bonin) (Reliability & Economic Upgrade)

| ** From bus | ** | ** To bus | ** | CKT | Contingency | | | | | Loading % |
|---|---|---|---|---|---|---|---|---|---|---|
| 97309 3GRENWD | 115 | 98522 3TEREBN | 115 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 159.7 |
| 97309 3GRENWD | 115 | 98520 3HUMPHY | 115 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 144.4 |
| 98520 3HUMPHY | 115 | 98521 3GIBSON | 115 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 143.5 |
| 98572 4GIBSON | 138 | 500740 RAMOS 4 | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 123.4 |
| 98410 4LIVON | 138 | 98411 4WILBT | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 120.8 |
| 98147 4L-642TP | 138 | 98410 4LIVON | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 108.2 |
| 97318 4KSPRGS | 138 | 98147 4L-642TP | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 106.5 |
| 97340 4EOPLOUS | 138 | 98141 4CHAMPNE | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 104.7 |
| 98521 3GIBSON | 115 | 98572 4GIBSON | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 104.4 |
| 98130 4SCOTT | 138 | 98131 2SCOTT | 69.0 | 1 | 98130 4SCOTT | 138 | 98131 2SCOTT | 69.0 | 2 | 103.7 |
| 98130 4SCOTT | 138 | 98131 2SCOTT | 69.0 | 2 | 98130 4SCOTT | 138 | 98131 2SCOTT | 69.0 | 1 | 103.7 |
| 500940 WELLS | 230 | 500950 WELSRCT6 | 230 | 1 | 98107 8RICHARD | 500 | 98109 8WELLS | 500 | 1 | 102.9 |
| 97319 4VATCAN | 138 | 97340 4EOPLOUS | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 100.6 |
| 98190 4CECELIA | 138 | 502404 BONIN 4 | 138 | 1 | 98108 4RICHARD | 138 | 98110 4COLACDY | 138 | 1 | 99 |
| 98177 4MORIL | 138 | 98184 4DUBOIN | 138 | 1 | 97309 3GRENWD | 115 | 98522 3TEREBN | 115 | 1 | 98.5 |
| 98190 4CECELIA | 138 | 502404 BONIN 4 | 138 | 1 | 98110 4COLACDY | 138 | 98111 4ACADGSU | 138 | 1 | 95.5 |
| 97318 4KSPRGS | 138 | 98141 4CHAMPNE | 138 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 95.2 |
| 98177 4MORIL | 138 | 98184 4DUBOIN | 138 | 1 | 98177 4MORIL | 138 | 500410 HOPKINS4 | 138 | 1 | 95 |

## 2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off) (Reliability & Economic Upgrade)

| ** From bus | ** | ** To bus | ** | CKT | Contingency | | | | | Loading % |
|---|---|---|---|---|---|---|---|---|---|---|
| 97309 3GRENWD | 115 | 98522 3TEREBN | 115 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 191.4 |
| 500820 TECHE 4 | 138 | 500830 TECHE 1 | 34.5 | 1 | 500820 TECHE 4 | 138 | 500830 TECHE 1 | 34.5 | 2 | 176.2 |
| 97309 3GRENWD | 115 | 98520 3HUMPHY | 115 | 1 | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 | 169.2 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98520 | 3HUMPHY | 115 | 98521 | 3GIBSON | 115 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **167.9** |
| 500820 | TECHE 4 | 138 | 500830 | TECHE 1 | 34.5 | 2 | 500820 | TECHE 4 | 138 | 500830 | TECHE 1 | 34.5 1 | **152.2** |
| 98410 | 4LIVON | 138 | 98411 | 4WILBT | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **143** |
| 98572 | 4GIBSON | 138 | 500740 | RAMOS 4 | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **139.5** |
| 97340 | 4EOPLOUS | 138 | 98141 | 4CHAMPNE | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **135.6** |
| 97319 | 4VATCAN | 138 | 97340 | 4EOPLOUS | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **128.4** |
| 98147 | 4L-642TP | 138 | 98410 | 4LIVON | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **126.2** |
| 97318 | 4KSPRGS | 138 | 98147 | 4L-642TP | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **123.5** |
| 500620 | NICKTAP | 69.0 | 502413 | ELKS 2 | 69.0 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **119.8** |
| 500940 | WELLS | 230 | 500950 | WELSRCT6 | 230 | 1 | 98107 | 8RICHARD | 500 | 98109 | 8WELLS | 500 1 | **111** |
| 500100 | BERWKTP4 | 138 | 500740 | RAMOS 4 | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **109** |
| 500060 | BVISTA 4 | 138 | 500100 | BERWKTP4 | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **107.8** |
| 98161 | 2MEAUX | 69.0 | 98162 | 2HUNTER | 69.0 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **106.4** |
| 500190 | COCODR 6 | 230 | 500880 | VILPLT 6 | 230 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **106.4** |
| 97318 | 4KSPRGS | 138 | 98141 | 4CHAMPNE | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **103.7** |
| 98130 | 4SCOTT | 138 | 98131 | 2SCOTT | 69.0 | 1 | 98130 | 4SCOTT | 138 | 98131 | 2SCOTT | 69.0 2 | **103.4** |
| 98130 | 4SCOTT | 138 | 98131 | 2SCOTT | 69.0 | 2 | 98130 | 4SCOTT | 138 | 98131 | 2SCOTT | 69.0 1 | **103.4** |
| 502402 | ACADIAN6 | 230 | 502403 | BONIN 6 | 230 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **101** |
| 500880 | VILPLT 6 | 230 | 500920 | WSTFORK6 | 230 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **100.1** |
| 98177 | 4MORIL | 138 | 98184 | 4DUBOIN | 138 | 1 | 97309 | 3GRENWD | 115 | 98522 | 3TEREBN | 115 1 | **98.5** |
| 98109 | 8WELLS | 500 | 500950 | WELSRCT6 | 230 | 1 | 98107 | 8RICHARD | 500 | 98109 | 8WELLS | 500 1 | **97.8** |
| 98109 | 8WELLS | 500 | 500950 | WELSRCT6 | 230 | 2 | 98107 | 8RICHARD | 500 | 98109 | 8WELLS | 500 1 | **97.8** |
| 98190 | 4CECELIA | 138 | 502404 | BONIN 4 | 138 | 1 | 98108 | 4RICHARD | 138 | 98110 | 4COLACDY | 138 1 | **96.7** |
| 502401 | FLANDER6 | 230 | 502402 | ACADIAN6 | 230 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **96** |
| 97323 | 4SEMERE | 138 | 98113 | 4SCOTT2 | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **95.8** |
| 502401 | FLANDER6 | 230 | 502402 | ACADIAN6 | 230 | 1 | 98108 | 4RICHARD | 138 | 500400 | HABETZ 4 | 138 1 | **95.8** |
| 98108 | 4RICHARD | 138 | 98110 | 4COLACDY | 138 | 1 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 1 | **95.6** |

## 2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off) (ICT option)

| ** From bus | ** | ** To bus | ** | CKT | Contingency | Loading % |
|---|---|---|---|---|---|---|
| 98130 4SCOTT | 138 | 502404 BONIN 4 | 138 | 1 | 500940 WELLS 230 502410 PMOUTON6 230 1 | *104.9* |
| 99905 WEBRE 6 | 230 | 99906 6CECELIA | 230 | 1 | 98109 8WELLS 500 98430 8WEBRE 500 1 | *103.0* |

## 2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off) (Webre & Richard Upgrade)

| ** From bus | ** | ** To bus | ** | CKT | Contingency | Loading % |
|---|---|---|---|---|---|---|
| 97309 3GRENWD | 115 | 98522 3TEREBN | 115 | 1 | 98109 8WELLS 500 98430 8WEBRE 500 1 | *110.4* |
| 98109 8WELLS | 500 | 500950 WELSRCT6 | 230 | 1 | 98107 8RICHARD 500 98109 8WELLS 500 1 | *116.3* |
| 98430 8WEBRE | 500 | 99905 WEBRE 6 | 230 | 1 | 98109 8WELLS 500 98430 8WEBRE 500 1 | *102.6* |

# Attachment G. Powerflow Voltage Report

## 2012 Summer Peak N-1 Criteria Violations

| Bus # | Bus Name | Cont-Volt | Base-Volt | Contingency Description |
|---|---|---|---|---|
| 98159 | 4LEROY | *0.9425* | *0.9425* | ** Base Case ** |
| 98160 | 4MEAUX | *0.9496* | *0.9496* | ** Base Case ** |
| 98178 | 4DELCAMB | *0.8372* | 0.9602 | 98177 4MORIL 138 98178 4DELCAMB 138 1 |
| 97330 | 4LEBLAN | *0.8379* | 0.9567 | 98177 4MORIL 138 98178 4DELCAMB 138 1 |
| 98179 | 4ABBVIL | *0.8543* | 0.9543 | 98177 4MORIL 138 98178 4DELCAMB 138 1 |
| 97330 | 4LEBLAN | *0.8592* | 0.9567 | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 |
| 98159 | 4LEROY | *0.8637* | *0.9425* | 98177 4MORIL 138 98178 4DELCAMB 138 1 |
| 98160 | 4MEAUX | *0.8715* | *0.9496* | 98177 4MORIL 138 98178 4DELCAMB 138 1 |
| 98179 | 4ABBVIL | *0.8723* | 0.9543 | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 |
| 98159 | 4LEROY | *0.8776* | *0.9425* | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 |
| 97324 | 4JUDICE | *0.8851* | 0.9504 | 97324 4JUDICE 138 98130 4SCOTT 138 1 |
| 98160 | 4MEAUX | *0.8853* | *0.9496* | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 |
| 98159 | 4LEROY | *0.8896* | *0.9425* | 97324 4JUDICE 138 98130 4SCOTT 138 1 |
| 97319 | 4VATCAN | *0.8958* | 0.9567 | 97319 4VATCAN 138 98130 4SCOTT 138 1 |
| 98110 | 4COLACDY | *0.8962* | 0.9872 | 98108 4RICHARD 138 98110 4COLACDY 138 1 |
| 98160 | 4MEAUX | *0.8972* | *0.9496* | 97324 4JUDICE 138 98130 4SCOTT 138 1 |
| 98111 | 4ACADGSU | *0.8979* | 0.9765 | 98108 4RICHARD 138 98110 4COLACDY 138 1 |
| 98112 | 4SCANLN | *0.8982* | 0.9752 | 98108 4RICHARD 138 98110 4COLACDY 138 1 |
| 502425 | BEADLE 6 | *0.8996* | 0.9672 | 502401 FLANDER6 230 502425 BEADLE 6 230 1 |
| 98410 | 4LIVON | *0.9020* | 0.9637 | 98410 4LIVON 138 98411 4WILBT 138 1 |
| 97324 | 4JUDICE | *0.9041* | 0.9504 | 98177 4MORIL 138 98178 4DELCAMB 138 1 |
| 97330 | 4LEBLAN | *0.9048* | 0.9567 | 98177 4MORIL 138 500410 HOPKINS4 138 1 |
| 97328 | 4VEAZIE | *0.9048* | 0.9682 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 98159 | 4LEROY | *0.9052* | *0.9425* | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98159 | 4LEROY | *0.9056* | *0.9425* | 98177 4MORIL 138 500410 HOPKINS4 138 1 |
| 98178 | 4DELCAMB | *0.9067* | 0.9602 | 98177 4MORIL 138 500410 HOPKINS4 138 1 |
| 97311 | 4PLAISN | *0.9079* | 0.9712 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 500720 | PLAISAN4 | *0.9080* | 0.9712 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 98148 | 4COLSPRG | *0.9082* | 0.9568 | 98410 4LIVON 138 98411 4WILBT 138 1 |
| 97318 | 4KSPRGS | *0.9083* | 0.9568 | 98410 4LIVON 138 98411 4WILBT 138 1 |
| 98147 | 4L-642TP | *0.9083* | 0.9568 | 98410 4LIVON 138 98411 4WILBT 138 1 |
| 98111 | 4ACADGSU | *0.9096* | 0.9765 | 98110 4COLACDY 138 98111 4ACADGSU 138 1 |
| 98112 | 4SCANLN | *0.9097* | 0.9752 | 98110 4COLACDY 138 98111 4ACADGSU 138 1 |
| 98179 | 4ABBVIL | *0.9097* | 0.9543 | 98177 4MORIL 138 500410 HOPKINS4 138 1 |
| 98179 | 4ABBVIL | *0.9103* | 0.9543 | 97324 4JUDICE 138 98130 4SCOTT 138 1 |
| 98159 | 4LEROY | *0.9116* | *0.9425* | 500820 TECHE 4 138 501823 G3TECHE 24.0 1 |
| 97324 | 4JUDICE | *0.9119* | 0.9504 | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98160 | 4MEAUX | *0.9126* | *0.9496* | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98160 | 4MEAUX | *0.9130* | *0.9496* | 98177 4MORIL 138 500410 HOPKINS4 138 1 |
| 97324 | 4JUDICE | *0.9136* | 0.9504 | 97330 4LEBLAN 138 98178 4DELCAMB 138 1 |
| 97318 | 4KSPRGS | *0.9138* | 0.9568 | 98109 8WELLS 500 98430 8WEBRE 500 1 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 98147 | 4L-642TP | *0.9138* | 0.9568 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 98148 | 4COLSPRG | *0.9138* | 0.9568 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 502404 | BONIN 4 | *0.9139* | 0.9641 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |
| 98410 | 4LIVON | *0.9141* | 0.9637 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 98112 | 4SCANLN | *0.9148* | 0.9752 | 98111 | 4ACADGSU | 138 | 98112 | 4SCANLN | 138 | 1 |
| 97323 | 4SEMERE | *0.9170* | 0.9549 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |
| 98190 | 4CECELIA | *0.9170* | 0.9550 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |
| 502425 | BEADLE 6 | *0.9175* | 0.9672 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |
| 98177 | 4MORIL | *0.9177* | 0.9782 | 98177 | 4MORIL | 138 | 500410 | HOPKINS4 | 138 | 1 |
| 502403 | BONIN 6 | *0.9177* | 0.9744 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |
| 97340 | 4EOPLOUS | *0.9179* | 0.9576 | 97319 | 4VATCAN | 138 | 98130 | 4SCOTT | 138 | 1 |
| 502402 | ACADIAN6 | *0.9183* | 0.9707 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |
| 98141 | 4CHAMPNE | *0.9187* | 0.9590 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 502401 | FLANDER6 | *0.9187* | 0.9694 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |
| 98160 | 4MEAUX | *0.9190* | *0.9496* | 500820 | TECHE 4 | 138 | 501823 | G3TECHE | 24.0 | 1 |
| 97319 | 4VATCAN | *0.9190* | 0.9567 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |
| 98159 | 4LEROY | *0.9192* | *0.9425* | 500940 | WELLS | 230 | 502410 | PMOUTON6 | 230 | 1 |
| 98179 | 4ABBVIL | *0.9199* | 0.9543 | 502403 | BONIN 6 | 230 | 502421 | LABBE | 230 | 1 |

## 2017 Summer Peak N-1 Criteria Violations

| Bus # | Bus Name | Cont-Volt | Base-Volt | Contingency Description | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 97324 | 4JUDICE | *0.8840* | 0.9591 | 97324 | 4JUDICE | 138 | 98130 | 4SCOTT | 138 | 1 |
| 98159 | 4LEROY | *0.8898* | 0.9525 | 97324 | 4JUDICE | 138 | 98130 | 4SCOTT | 138 | 1 |
| 502425 | BEADLE 6 | *0.8944* | 0.9718 | 502401 | FLANDER6 | 230 | 502425 | BEADLE 6 | 230 | 1 |
| 98110 | 4COLACDY | *0.8950* | 0.9843 | 98108 | 4RICHARD | 138 | 98110 | 4COLACDY | 138 | 1 |
| 98111 | 4ACADGSU | *0.8969* | 0.9741 | 98108 | 4RICHARD | 138 | 98110 | 4COLACDY | 138 | 1 |
| 98112 | 4SCANLN | *0.8973* | 0.9729 | 98108 | 4RICHARD | 138 | 98110 | 4COLACDY | 138 | 1 |
| 98160 | 4MEAUX | *0.8976* | 0.9598 | 97324 | 4JUDICE | 138 | 98130 | 4SCOTT | 138 | 1 |
| 97328 | 4VEAZIE | *0.8994* | 0.9873 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 98159 | 4LEROY | *0.9001* | 0.9525 | 98177 | 4MORIL | 138 | 98178 | 4DELCAMB | 138 | 1 |
| 97311 | 4PLAISN | *0.9027* | 0.9903 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 500720 | PLAISAN4 | *0.9028* | 0.9903 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 98178 | 4DELCAMB | *0.9056* | 0.9700 | 98177 | 4MORIL | 138 | 98178 | 4DELCAMB | 138 | 1 |
| 97330 | 4LEBLAN | *0.9063* | 0.9682 | 98177 | 4MORIL | 138 | 98178 | 4DELCAMB | 138 | 1 |
| 98179 | 4ABBVIL | *0.9063* | 0.9647 | 98177 | 4MORIL | 138 | 98178 | 4DELCAMB | 138 | 1 |
| 97319 | 4VATCAN | *0.9070* | 0.9659 | 97319 | 4VATCAN | 138 | 98130 | 4SCOTT | 138 | 1 |
| 98160 | 4MEAUX | *0.9078* | 0.9598 | 98177 | 4MORIL | 138 | 98178 | 4DELCAMB | 138 | 1 |
| 98111 | 4ACADGSU | *0.9099* | 0.9741 | 98110 | 4COLACDY | 138 | 98111 | 4ACADGSU | 138 | 1 |
| 98112 | 4SCANLN | *0.9100* | 0.9729 | 98110 | 4COLACDY | 138 | 98111 | 4ACADGSU | 138 | 1 |
| 98179 | 4ABBVIL | *0.9114* | 0.9647 | 97324 | 4JUDICE | 138 | 98130 | 4SCOTT | 138 | 1 |
| 98141 | 4CHAMPNE | *0.9149* | 0.9709 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 98112 | 4SCANLN | *0.9157* | 0.9729 | 98111 | 4ACADGSU | 138 | 98112 | 4SCANLN | 138 | 1 |
| 98159 | 4LEROY | *0.9169* | 0.9525 | 500940 | WELLS | 230 | 502410 | PMOUTON6 | 230 | 1 |
| 97318 | 4KSPRGS | *0.9195* | 0.9654 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| 98147 | 4L-642TP | *0.9196* | 0.9654 | 500230 COUGH 4 | 138 500720 PLAISAN4 138 1 |
| 98148 | 4COLSPRG | *0.9196* | 0.9653 | 500230 COUGH 4 | 138 500720 PLAISAN4 138 1 |

## 2017 Summer Peak N-1 Criteria Violations (Reliability Upgrade)

| Bus # | Bus Name | Cont-Volt | Base-Volt | Contingency Description |
|---|---|---|---|---|
| 502425 | BEADLE 6 | *0.8975* | 0.9765 | 502401 FLANDER6 230 502425 BEADLE 6 230 1 |
| 97319 | 4VATCAN | *0.9082* | 0.9756 | 97319 4VATCAN 138 98130 4SCOTT 138 1 |
| 97328 | 4VEAZIE | *0.9110* | 0.9913 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 97311 | 4PLAISN | *0.9142* | 0.9942 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 500720 | PLAISAN4 | *0.9143* | 0.9943 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |

## 2017 Summer Peak N-1 G-1Criteria Violations (Teche Unit 3) (Reliability & Economic Upgrade)

| Bus # | Bus Name | Cont-Volt | Base-Volt | Contingency Description |
|---|---|---|---|---|
| 97319 | 4VATCAN | *0.9079* | 0.9770 | 97319 4VATCAN 138 98130 4SCOTT 138 1 |
| 98410 | 4LIVON | *0.9104* | 0.9740 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97328 | 4VEAZIE | *0.9137* | 0.9915 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 97318 | 4KSPRGS | *0.9158* | 0.9709 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98147 | 4L-642TP | *0.9158* | 0.9709 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98148 | 4COLSPRG | *0.9158* | 0.9708 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97311 | 4PLAISN | *0.9170* | 0.9945 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 500720 | PLAISAN4 | *0.9171* | 0.9946 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |

## 2017 Summer Peak N-1 G-2Criteria Violations (Teche & Bonin) (Reliability & Economic Upgrade)

| Bus # | Bus Name | Cont-Volt | Base-Volt | Contingency Description |
|---|---|---|---|---|
| 98410 | 4LIVON | *0.8823* | 0.9696 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98148 | 4COLSPRG | *0.8849* | 0.9654 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97318 | 4KSPRGS | *0.8850* | 0.9654 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98147 | 4L-642TP | *0.8850* | 0.9654 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97328 | 4VEAZIE | *0.9025* | 0.9875 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 98141 | 4CHAMPNE | *0.9050* | 0.9711 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97340 | 4EOPLOUS | *0.9051* | 0.9684 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97311 | 4PLAISN | *0.9058* | 0.9905 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 500720 | PLAISAN4 | *0.9059* | 0.9906 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 97319 | 4VATCAN | *0.9070* | 0.9648 | 97319 4VATCAN 138 98130 4SCOTT 138 1 |
| 98521 | 3GIBSON | *0.9128* | 0.9934 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98520 | 3HUMPHY | *0.9155* | 0.9874 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97309 | 3GRENWD | *0.9167* | 0.9874 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97319 | 4VATCAN | *0.9179* | 0.9648 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98410 | 4LIVON | *0.9180* | 0.9696 | 98410 4LIVON 138 98411 4WILBT 138 1 |
| 98141 | 4CHAMPNE | *0.9180* | 0.9711 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |

## 2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off) (Reliability & Economic Upgrade)

| Bus # | Bus Name | Cont-Volt | Base-Volt | Contingency Description |
|---|---|---|---|---|
| 98521 | 3GIBSON | *0.8762* | 0.9917 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98520 | 3HUMPHY | *0.8871* | 0.9858 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97309 | 3GRENWD | *0.8888* | 0.9858 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97328 | 4VEAZIE | *0.8981* | 0.9838 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 97324 | 4JUDICE | *0.8991* | 0.9586 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98572 | 4GIBSON | *0.8992* | 0.9917 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 502425 | BEADLE 6 | *0.9003* | 0.9633 | 502401 FLANDER6 230 502425 BEADLE 6 230 1 |
| 98159 | 4LEROY | *0.9007* | 0.9580 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97311 | 4PLAISN | *0.9014* | 0.9868 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 500720 | PLAISAN4 | *0.9015* | 0.9869 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 97323 | 4SEMERE | *0.9025* | 0.9588 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98190 | 4CECELIA | *0.9025* | 0.9591 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98130 | 4SCOTT | *0.9027* | 0.9632 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97319 | 4VATCAN | *0.9047* | 0.9590 | 97319 4VATCAN 138 98130 4SCOTT 138 1 |
| 502404 | BONIN 4 | *0.9068* | 0.9677 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500090 | BERWIC 4 | *0.9081* | 1.0057 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500100 | BERWKTP4 | *0.9081* | 1.0057 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98160 | 4MEAUX | *0.9084* | 0.9653 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500060 | BVISTA 4 | *0.9091* | 1.0040 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98179 | 4ABBVIL | *0.9102* | 0.9691 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 503306 | ABBVILL4 | *0.9102* | 0.9653 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500630 | N.BEND 4 | *0.9106* | 0.9970 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98184 | 4DUBOIN | *0.9113* | 0.9718 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500290 | ELPTAP 4 | *0.9115* | 1.0020 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98178 | 4DELCAMB | *0.9116* | 0.9715 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97310 | 4BAYRAM | *0.9120* | 1.0104 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 97330 | 4LEBLAN | *0.9120* | 0.9721 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500740 | RAMOS 4 | *0.9120* | 1.0105 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500775 | SEGURA6 | *0.9125* | 0.9653 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500050 | BSALES 4 | *0.9129* | 1.0040 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98177 | 4MORIL | *0.9131* | 0.9719 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500890 | WAXLAKE4 | *0.9131* | 1.0017 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98410 | 4LIVON | *0.9132* | 0.9665 | 98410 4LIVON 138 98411 4WILBT 138 1 |
| 500565 | MEAUX 6 | *0.9133* | 0.9653 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 502417 | ELKS 6 | *0.9135* | 0.9653 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98141 | 4CHAMPNE | *0.9137* | 0.9667 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 502425 | BEADLE 6 | *0.9146* | 0.9633 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 502401 | FLANDER6 | *0.9151* | 0.9647 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 500660 | PATOUT 4 | *0.9154* | 0.9810 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98112 | 4SCANLN | *0.9154* | 0.9759 | 98111 4ACADGSU 138 98112 4SCANLN 138 1 |
| 500410 | HOPKINS4 | *0.9156* | 0.9755 | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 502402 | ACADIAN6 | *0.9158* | 0.9658 | 98109 8WELLS 500 98430 8WEBRE 500 1 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 98185 | 4BUWHSE | *0.9162* | 0.9819 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 500820 | TECHE 4 | *0.9165* | 0.9897 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 500776 | SELLRD6 | *0.9169* | 0.9653 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 502403 | BONIN 6 | *0.9179* | 0.9694 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 97318 | 4KSPRGS | *0.9180* | 0.9618 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 98148 | 4COLSPRG | *0.9180* | 0.9618 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 500030 | BELPLA 4 | *0.9180* | 0.9771 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 500580 | MORBHAN4 | *0.9180* | 0.9772 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 98147 | 4L-642TP | *0.9181* | 0.9618 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 500330 | FLANDR 4 | *0.9182* | 1.0020 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 500450 | JULIEN 4 | *0.9187* | 0.9886 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 502421 | LABBE | *0.9187* | 0.9702 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |
| 98148 | 4COLSPRG | *0.9194* | 0.9618 | 98410 | 4LIVON | 138 | 98411 | 4WILBT | 138 | 1 |
| 97318 | 4KSPRGS | *0.9195* | 0.9618 | 98410 | 4LIVON | 138 | 98411 | 4WILBT | 138 | 1 |
| 98147 | 4L-642TP | *0.9195* | 0.9618 | 98410 | 4LIVON | 138 | 98411 | 4WILBT | 138 | 1 |
| 500440 | IVANHOE4 | *0.9198* | 0.9878 | 98109 | 8WELLS | 500 | 98430 | 8WEBRE | 500 | 1 |

## 2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off) (ICT option)

| Bus # | Bus Name | Cont-Volt | Base-Volt | Contingency Description | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 98130 | 4SCOTT | *0.9367* | *0.9367* | ** | Base Case | ** | | | |
| 98159 | 4LEROY | *0.9085* | *0.9085* | ** | Base Case | ** | | | |
| 98160 | 4MEAUX | *0.9162* | *0.9162* | ** | Base Case | ** | | | |
| 98177 | 4MORIL | *0.9465* | *0.9465* | ** | Base Case | ** | | | |
| 98178 | 4DELCAMB | *0.9367* | *0.9367* | ** | Base Case | ** | | | |
| 98179 | 4ABBVIL | *0.926* | *0.926* | ** | Base Case | ** | | | |
| 98184 | 4DUBOIN | *0.9493* | *0.9493* | ** | Base Case | ** | | | |
| 98190 | 4CECELIA | *0.9496* | *0.9496* | ** | Base Case | ** | | | |
| 500330 | FLANDR 4 | *0.9497* | *0.9497* | ** | Base Case | ** | | | |
| 500944 | 6 MORIL | *0.9466* | *0.9466* | ** | Base Case | ** | | | |
| 98130 | 4SCOTT | *0.9174* | *0.9367* | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 1 |
| 98159 | 4LEROY | *0.8812* | *0.9085* | 97324 | 4JUDICE | 138 | 98130 | 4SCOTT | 138 1 |
| 98159 | 4LEROY | *0.8812* | *0.9085* | 97330 | 4LEBLAN | 138 | 98179 | 4ABBVIL | 138 1 |
| 98159 | 4LEROY | *0.8871* | *0.9085* | 98160 | 4MEAUX | 138 | 98179 | 4ABBVIL | 138 1 |
| 98160 | 4MEAUX | *0.8879* | *0.9162* | 97513 | 7GRIMES | 345 | 97554 | GRMXF | 345 1 |
| 98160 | 4MEAUX | *0.8891* | *0.9162* | 97324 | 4JUDICE | 138 | 98130 | 4SCOTT | 138 1 |
| 98160 | 4MEAUX | *0.8891* | *0.9162* | 97330 | 4LEBLAN | 138 | 98179 | 4ABBVIL | 138 1 |
| 98179 | 4ABBVIL | *0.8891* | *0.926* | 97330 | 4LEBLAN | 138 | 98179 | 4ABBVIL | 138 1 |
| 98159 | 4LEROY | *0.8913* | *0.9085* | 500940 | WELLS | 230 | 502410 | PMOUTON6 | 230 1 |
| 98141 | 4CHAMPNE | *0.8916* | 0.9532 | 500230 | COUGH 4 | 138 | 500720 | PLAISAN4 | 138 1 |
| 98159 | 4LEROY | *0.8932* | *0.9085* | 500920 | WSTFORK6 | 230 | 500940 | WELLS | 230 1 |
| 98159 | 4LEROY | *0.8932* | *0.9085* | 97324 | 4JUDICE | 138 | 98160 | 4MEAUX | 138 1 |
| 98159 | 4LEROY | *0.8947* | *0.9085* | 97329 | 4NCROWL | 138 | 98108 | 4RICHARD | 138 1 |
| 98160 | 4MEAUX | *0.895* | *0.9162* | 98160 | 4MEAUX | 138 | 98179 | 4ABBVIL | 138 1 |
| 98159 | 4LEROY | *0.8952* | *0.9085* | 500940 | WELLS | 230 | 500950 | WELSRCT6 | 230 1 |
| 98159 | 4LEROY | *0.8952* | *0.9085* | 98190 | 4CECELIA | 138 | 99906 | 6CECELIA | 230 1 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 98130 | 4SCOTT | *0.8955* | *0.9367* | 500940 WELLS | 230 | 502410 PMOUTON6 | 230 | 1 |
| 98159 | 4LEROY | *0.8968* | *0.9085* | 97329 4NCROWL | 138 | 98130 4SCOTT | 138 | 1 |
| 98159 | 4LEROY | *0.8969* | *0.9085* | 98108 4RICHARD | 138 | 98130 4SCOTT | 138 | 1 |
| 98179 | 4ABBVIL | *0.8976* | *0.926* | 97513 7GRIMES | 345 | 97554 GRMXF | 345 | 1 |
| 98147 | 4L-642TP | *0.8976* | 0.9519 | 98410 4LIVON | 138 | 98411 4WILBT | 138 | 1 |
| 98160 | 4MEAUX | *0.8992* | *0.9162* | 500940 WELLS | 230 | 502410 PMOUTON6 | 230 | 1 |
| 98160 | 4MEAUX | *0.901* | *0.9162* | 500920 WSTFORK6 | 230 | 500940 WELLS | 230 | 1 |
| 98160 | 4MEAUX | *0.901* | *0.9162* | 97324 4JUDICE | 138 | 98160 4MEAUX | 138 | 1 |
| 98160 | 4MEAUX | *0.9025* | *0.9162* | 97329 4NCROWL | 138 | 98108 4RICHARD | 138 | 1 |
| 500330 | FLANDR 4 | *0.9027* | *0.9497* | 500940 WELLS | 230 | 502410 PMOUTON6 | 230 | 1 |
| 98160 | 4MEAUX | *0.9029* | *0.9162* | 500940 WELLS | 230 | 500950 WELSRCT6 | 230 | 1 |
| 98160 | 4MEAUX | *0.903* | *0.9162* | 98190 4CECELIA | 138 | 99906 6CECELIA | 230 | 1 |
| 98130 | 4SCOTT | *0.9032* | *0.9367* | 502410 PMOUTON6 | 230 | 502421 LABBE | 230 | 1 |
| 98160 | 4MEAUX | *0.9046* | *0.9162* | 97329 4NCROWL | 138 | 98130 4SCOTT | 138 | 1 |
| 98160 | 4MEAUX | *0.9047* | *0.9162* | 98108 4RICHARD | 138 | 98130 4SCOTT | 138 | 1 |
| 98160 | 4MEAUX | *0.9048* | *0.9162* | 97916 8NELSON | 500 | 98107 8RICHARD | 500 | 1 |
| 98130 | 4SCOTT | *0.9049* | *0.9367* | 502403 BONIN 6 | 230 | 502421 LABBE | 230 | 1 |
| 98130 | 4SCOTT | *0.9074* | *0.9367* | 97513 7GRIMES | 345 | 97554 GRMXF | 345 | 1 |
| 98179 | 4ABBVIL | *0.9081* | *0.926* | 97324 4JUDICE | 138 | 98130 4SCOTT | 138 | 1 |
| 98190 | 4CECELIA | *0.9084* | *0.9496* | 98190 4CECELIA | 138 | 99906 6CECELIA | 230 | 1 |
| 98178 | 4DELCAMB | *0.9087* | *0.9367* | 97513 7GRIMES | 345 | 97554 GRMXF | 345 | 1 |
| 98179 | 4ABBVIL | *0.911* | *0.926* | 500920 WSTFORK6 | 230 | 500940 WELLS | 230 | 1 |
| 98179 | 4ABBVIL | *0.9112* | *0.926* | 500940 WELLS | 230 | 502410 PMOUTON6 | 230 | 1 |
| 500330 | FLANDR 4 | *0.9118* | *0.9497* | 502410 PMOUTON6 | 230 | 502421 LABBE | 230 | 1 |
| 98141 | 4CHAMPNE | *0.9121* | 0.9532 | 98141 4CHAMPNE | 138 | 500720 PLAISAN4 | 138 | 1 |
| 98179 | 4ABBVIL | *0.9124* | *0.926* | 97324 4JUDICE | 138 | 98160 4MEAUX | 138 | 1 |
| 98179 | 4ABBVIL | *0.9127* | *0.926* | 500940 WELLS | 230 | 500950 WELSRCT6 | 230 | 1 |
| 98179 | 4ABBVIL | *0.913* | *0.926* | 98190 4CECELIA | 138 | 99906 6CECELIA | 230 | 1 |
| 500400 | HABETZ 4 | *0.9132* | 0.9656 | 98108 4RICHARD | 138 | 500400 HABETZ 4 | 138 | 1 |
| 98179 | 4ABBVIL | *0.9136* | *0.926* | 97329 4NCROWL | 138 | 98108 4RICHARD | 138 | 1 |
| 500330 | FLANDR 4 | *0.9139* | *0.9497* | 502403 BONIN 6 | 230 | 502421 LABBE | 230 | 1 |
| 500330 | FLANDR 4 | *0.9145* | *0.9497* | 502402 ACADIAN6 | 230 | 502403 BONIN 6 | 230 | 1 |
| 98111 | 4ACADGSU | *0.9156* | 0.9643 | 98110 4COLACDY | 138 | 98111 4ACADGSU | 138 | 1 |
| 98112 | 4SCANLN | *0.9158* | 0.9632 | 98110 4COLACDY | 138 | 98111 4ACADGSU | 138 | 1 |
| 98130 | 4SCOTT | *0.9161* | *0.9367* | 97329 4NCROWL | 138 | 98108 4RICHARD | 138 | 1 |
| 500330 | FLANDR 4 | *0.917* | *0.9497* | 502401 FLANDER6 | 230 | 502402 ACADIAN6 | 230 | 1 |
| 98130 | 4SCOTT | *0.917* | *0.9367* | 98109 8WELLS | 500 | 98430 8WEBRE | 500 | 1 |
| 98130 | 4SCOTT | *0.9184* | *0.9367* | 500920 WSTFORK6 | 230 | 500940 WELLS | 230 | 1 |
| 98130 | 4SCOTT | *0.9187* | *0.9367* | 97329 4NCROWL | 138 | 98130 4SCOTT | 138 | 1 |
| 98130 | 4SCOTT | *0.919* | *0.9367* | 99905 WEBRE 6 | 230 | 99906 6CECELIA | 230 | 1 |
| 98177 | 4MORIL | *0.9191* | *0.9465* | 97513 7GRIMES | 345 | 97554 GRMXF | 345 | 1 |
| 500944 | 6 MORIL | *0.9198* | *0.9466* | 97513 7GRIMES | 345 | 97554 GRMXF | 345 | 1 |
| 98113 | 4SCOTT2 | *0.9442* | 0.9594 | 99905 WEBRE 6 | 230 | 99906 6CECELIA | 230 | 1 |

**2017 Summer Peak N-1, G-All Criteria Violations (All ALP gen off)**
**(Webre & Richard Upgrade)**

| Bus # | Bus Name | Cont-Volt | Base-Volt | Contingency Description |
|---|---|---|---|---|
| 98159 | 4LEROY | *0.9429* | *0.9429* | ** Base Case ** |
| 98190 | 4CECELIA | *0.9483* | 0.9483 | ** Base Case ** |
| 98111 | 4ACADGSU | *0.8933* | 0.9636 | 98110 4COLACDY 138 98111 4ACADGSU 138 1 |
| 98112 | 4SCANLN | *0.8934* | 0.9624 | 98110 4COLACDY 138 98111 4ACADGSU 138 1 |
| 98112 | 4SCANLN | *0.9009* | 0.9624 | 98111 4ACADGSU 138 98112 4SCANLN 138 1 |
| 98113 | 4SCOTT2 | *0.9015* | 0.9584 | 98110 4COLACDY 138 98111 4ACADGSU 138 1 |
| 98113 | 4SCOTT2 | *0.9078* | 0.9584 | 98111 4ACADGSU 138 98112 4SCANLN 138 1 |
| 98130 | 4SCOTT | *0.9174* | 0.9563 | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 98130 | 4SCOTT | *0.9185* | 0.9563 | 502410 PMOUTON6 230 502421 LABBE 230 1 |
| 98141 | 4CHAMPNE | *0.8995* | 0.9626 | 500230 COUGH 4 138 500720 PLAISAN4 138 1 |
| 98159 | 4LEROY | *0.9176* | *0.9429* | 500190 COCODR 6 230 500880 VILPLT 6 230 1 |
| 98159 | 4LEROY | *0.8905* | *0.9429* | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 98159 | 4LEROY | *0.8946* | *0.9429* | 502410 PMOUTON6 230 502421 LABBE 230 1 |
| 98159 | 4LEROY | *0.8969* | *0.9429* | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98159 | 4LEROY | *0.9089* | *0.9429* | 500942 MEAUX 6 230 500948 SELRSRD6 230 1 |
| 98159 | 4LEROY | *0.9094* | *0.9429* | 98160 4MEAUX 138 500942 MEAUX 6 230 1 |
| 98159 | 4LEROY | *0.9106* | *0.9429* | 97513 7GRIMES 345 97554 GRMXF 345 1 |
| 98159 | 4LEROY | *0.9149* | *0.9429* | 98109 8WELLS 500 98430 8WEBRE 500 1 |
| 98159 | 4LEROY | *0.9186* | *0.9429* | 500880 VILPLT 6 230 500920 WSTFORK6 230 1 |
| 98159 | 4LEROY | *0.9187* | *0.9429* | 98158 6RICHARD 230 500948 SELRSRD6 230 1 |
| 98160 | 4MEAUX | *0.8984* | 0.9503 | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 98160 | 4MEAUX | *0.9024* | 0.9503 | 502410 PMOUTON6 230 502421 LABBE 230 1 |
| 98160 | 4MEAUX | *0.9047* | 0.9503 | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98160 | 4MEAUX | *0.9166* | 0.9503 | 500942 MEAUX 6 230 500948 SELRSRD6 230 1 |
| 98160 | 4MEAUX | *0.9171* | 0.9503 | 98160 4MEAUX 138 500942 MEAUX 6 230 1 |
| 98160 | 4MEAUX | *0.9181* | 0.9503 | 97513 7GRIMES 345 97554 GRMXF 345 1 |
| 98177 | 4MORIL | *0.9127* | 0.9616 | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 98177 | 4MORIL | *0.9171* | 0.9616 | 502410 PMOUTON6 230 502421 LABBE 230 1 |
| 98177 | 4MORIL | *0.9195* | 0.9616 | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98178 | 4DELCAMB | *0.908* | 0.9594 | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 98178 | 4DELCAMB | *0.9124* | 0.9594 | 502410 PMOUTON6 230 502421 LABBE 230 1 |
| 98178 | 4DELCAMB | *0.9148* | 0.9594 | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98179 | 4ABBVIL | *0.9029* | 0.9554 | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 98179 | 4ABBVIL | *0.9072* | 0.9554 | 502410 PMOUTON6 230 502421 LABBE 230 1 |
| 98179 | 4ABBVIL | *0.9096* | 0.9554 | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98184 | 4DUBOIN | *0.9133* | 0.9609 | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 98184 | 4DUBOIN | *0.9177* | 0.9609 | 502410 PMOUTON6 230 502421 LABBE 230 1 |
| 98190 | 4CECELIA | *0.9047* | 0.9483 | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 98190 | 4CECELIA | *0.9072* | *0.9483* | 502410 PMOUTON6 230 502421 LABBE 230 1 |
| 98190 | 4CECELIA | *0.9092* | *0.9483* | 502403 BONIN 6 230 502421 LABBE 230 1 |
| 98190 | 4CECELIA | *0.9175* | *0.9483* | 97513 7GRIMES 345 97554 GRMXF 345 1 |
| 500330 | FLANDR 4 | *0.8799* | 0.9522 | 500940 WELLS 230 502410 PMOUTON6 230 1 |
| 500330 | FLANDR 4 | *0.8855* | 0.9522 | 502410 PMOUTON6 230 502421 LABBE 230 1 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 500330 | FLANDR 4 | *0.8883* | 0.9522 | 502403 | BONIN | 6 | 230 | 502421 | LABBE | 230 | 1 |
| 500330 | FLANDR 4 | *0.9126* | 0.9522 | 502402 | ACADIAN | 6 | 230 | 502403 | BONIN 6 | 230 | 1 |
| 500400 | HABETZ 4 | *0.912* | 0.968 | 98108 | 4RICHARD | | 138 | 500400 | HABETZ 4 | 138 | 1 |
| 500410 | HOPKINS4 | *0.9147* | 0.9632 | 500940 | WELLS | | 230 | 502410 | PMOUTON6 | 230 | 1 |
| 500410 | HOPKINS4 | *0.9192* | 0.9632 | 502410 | PMOUTON6 | | 230 | 502421 | LABBE | 230 | 1 |
| 500720 | PLAISAN4 | *0.8871* | 0.9836 | 500230 | COUGH | 4 | 138 | 500720 | PLAISAN4 | 138 | 1 |
| 500942 | MEAUX 6 | *0.8936* | 0.9531 | 500940 | WELLS | | 230 | 502410 | PMOUTON6 | 230 | 1 |
| 500942 | MEAUX 6 | *0.8984* | 0.9531 | 502410 | PMOUTON6 | | 230 | 502421 | LABBE | 230 | 1 |
| 500942 | MEAUX 6 | *0.9008* | 0.9531 | 502403 | BONIN | 6 | 230 | 502421 | LABBE | 230 | 1 |
| 500942 | MEAUX 6 | *0.9166* | 0.9531 | 500942 | MEAUX | 6 | 230 | 500948 | SELRSRD6 | 230 | 1 |
| 500944 | MORIL 6 | *0.9048* | 0.9578 | 500940 | WELLS | | 230 | 502410 | PMOUTON6 | 230 | 1 |
| 500944 | MORIL 6 | *0.9092* | 0.9578 | 98109 | 8WELLS | | 500 | 98430 | 8WEBRE | 500 | 1 |
| 500944 | MORIL 6 | *0.9093* | 0.9578 | 502410 | PMOUTON6 | | 230 | 502421 | LABBE | 230 | 1 |
| 500944 | MORIL 6 | *0.9115* | 0.9578 | 502403 | BONIN | 6 | 230 | 502421 | LABBE | 230 | 1 |
| 500948 | SELRSRD6 | *0.8927* | 0.9562 | 500940 | WELLS | | 230 | 502410 | PMOUTON6 | 230 | 1 |
| 500948 | SELRSRD6 | *0.8978* | 0.9562 | 502410 | PMOUTON6 | | 230 | 502421 | LABBE | 230 | 1 |
| 500948 | SELRSRD6 | *0.9004* | 0.9562 | 502403 | BONIN | 6 | 230 | 502421 | LABBE | 230 | 1 |
| 502415 | BONINBYPS | *0.9157* | 0.9554 | 500940 | WELLS | | 230 | 502410 | PMOUTON6 | 230 | 1 |
| 502415 | BONINBYPS | *0.9171* | 0.9554 | 502410 | PMOUTON6 | | 230 | 502421 | LABBE | 230 | 1 |
| 502415 | BONINBYPS | *0.9189* | 0.9554 | 502403 | BONIN | 6 | 230 | 502421 | LABBE | 230 | 1 |

# Entergy Gulf States, Inc. (Louisiana)

# Proposed Transmission Reliability Projects

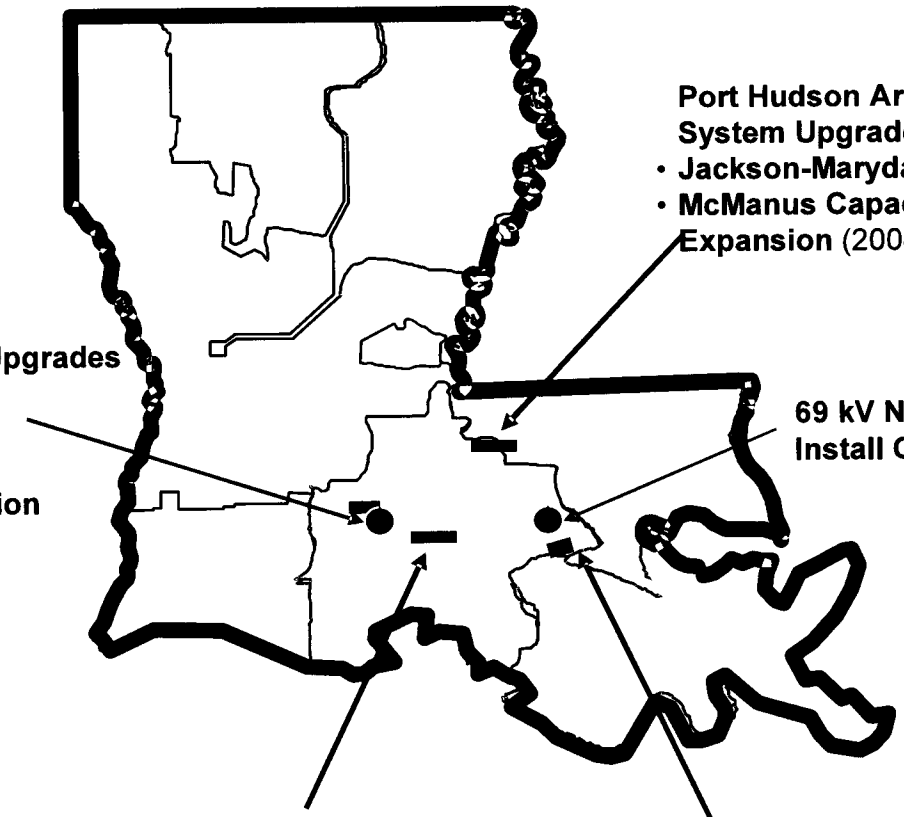
**Entergy Transmission Planning Summit**

**New Orleans, LA**

**July 13, 2006**

Entergy

# Proposed 2006-10 EGSI-LA Transmission Reliability Projects



**Port Hudson Area 69 kV System Upgrades:**
- **Jackson-Marydale** (2008)
- **McManus Capacitor Bank Expansion** (2008)

**Jennings Area 69 kV System Upgrades**
**Phase I** (2007):
- **Lawtag-Jennings**
- **Lake Charles Bulk-Chlomal**
- **Lacassine breaker installation**
- **Chlomal-Iowa**

**Phase II** (2008):
- **Chlomal-Lacassine**
- **Winn cap bank installation**

**Phase III** (2009):
- **Welsh-Lawtag**

**69 kV Nesser Substation: Install Capacitor Bank** (2009)

**69 kV Lafayette-Holiday: Line Upgrade** (2008)

**138 kV Alchem-Monochem: Line Upgrade** (2009)

***Various Areas:***
- **Circuit Breaker Upgrades (2006 and beyond)**

Entergy

# Lawtag-Jennings: 69 kV line Upgrade

## Scenario:

- The 69kV transmission system between Jennings and Chlomal substations serves approximately 90 MW of load including the radial transmission system from Lawtag substation. The main "trunk" of these systems is the contiguous segments comprised of Line 13 (Jennings-Compton-Elton), Line 16 (Elton-Tupper-Serpent-Carter), and Line 11 (Carter-Lacassine-Chlomal).
- For the loss of 69kV line Lawtag to Jennings, the Chlomal to Iowa line overloads in summer 2007. For the loss of 500kV line Nelson to Richard, both the Lawtag to Jennings line and the Welsh to Lawtag line overload in summer 2007.

## Recommended solution:

To reliably serve the load in this area, the following portfolios of projects are proposed:

**Phase I (2007):**

- Upgrade 4.78 miles of 4/0 CU from Jennings to Lawtag with a conductor rated at least 106 MVA of capacity.
- Install a 15 MVAr capacitor bank at Winn Substation.
- Upgrade about 8 miles of 4/0 CU from Chlomal to Iowa with a conductor rated at least 106 MVA of capacity.
- **Estimated cost: $8 MM**

**Phase II (2008):**

- Upgrade 12.36 miles of 1/0 ACSR from Chlomal to Lacassine with a conductor rated at least 106MVA of capacity.
- Install a circuit breaker at Lacassine.
- **Estimated cost: $7.8 MM**

**Phase III (2009):**

- Upgrade about 6 miles of 4/0 CU from Welsh to Lawtag with a conductor rated at least 106 MVA of capacity.
- Upgrade 3.07 miles of 795 AA from Lake Charles Bulk to Chlomal with a conductor rated at least 133 MVA of capacity.
- **Estimated cost: $5.4 MM**

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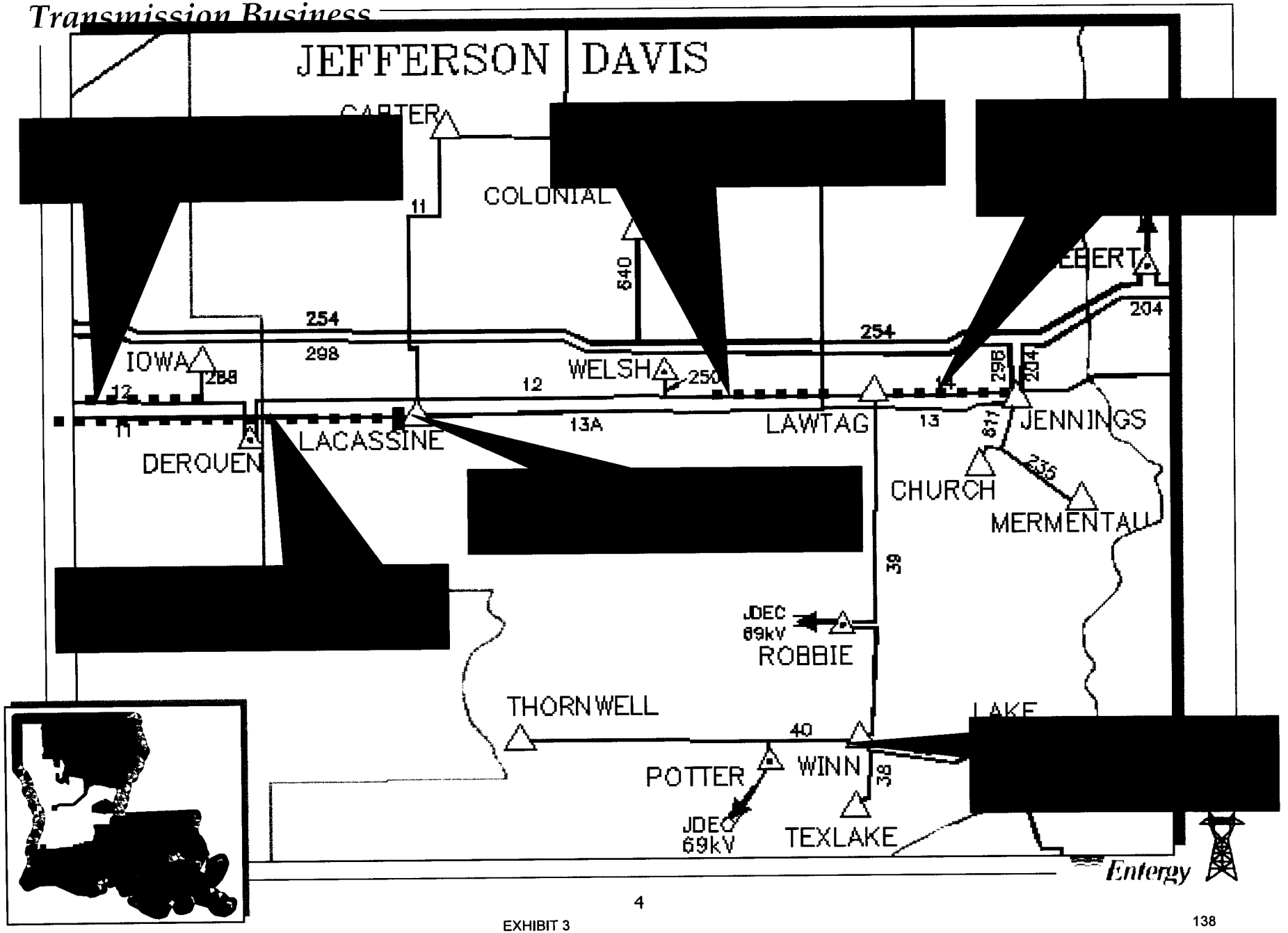
Transmission Business
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DAVIS
CARTER
COLONIAL
11
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254
298
IOWA
288
12
11
DEROUEN
LACASSINE
WELSH
250
12
13A
LAWTAG
13
254
298B
204
617
JENNINGS
CHURCH
MERMENTAU
39
JDEC
69kV
ROBBIE
THORNWELL
40
POTTER
WINN
JDEC
69kV
TEXLAKE
Entergy

# Lafayette-Holiday: Upgrade 69 kV Line

**Scenario:**

- There is approximately 141 MW of load in the area between Scott and New Iberia. The Lafayette-Holiday-Billeaud line is currently rated at 39 MVA.
- Loss of the Moril 138/69 kV auto or loss of Moril-New Iberia 69 kV line causes an overload on the Lafayette-Holiday line under expected summer 2007 load levels.

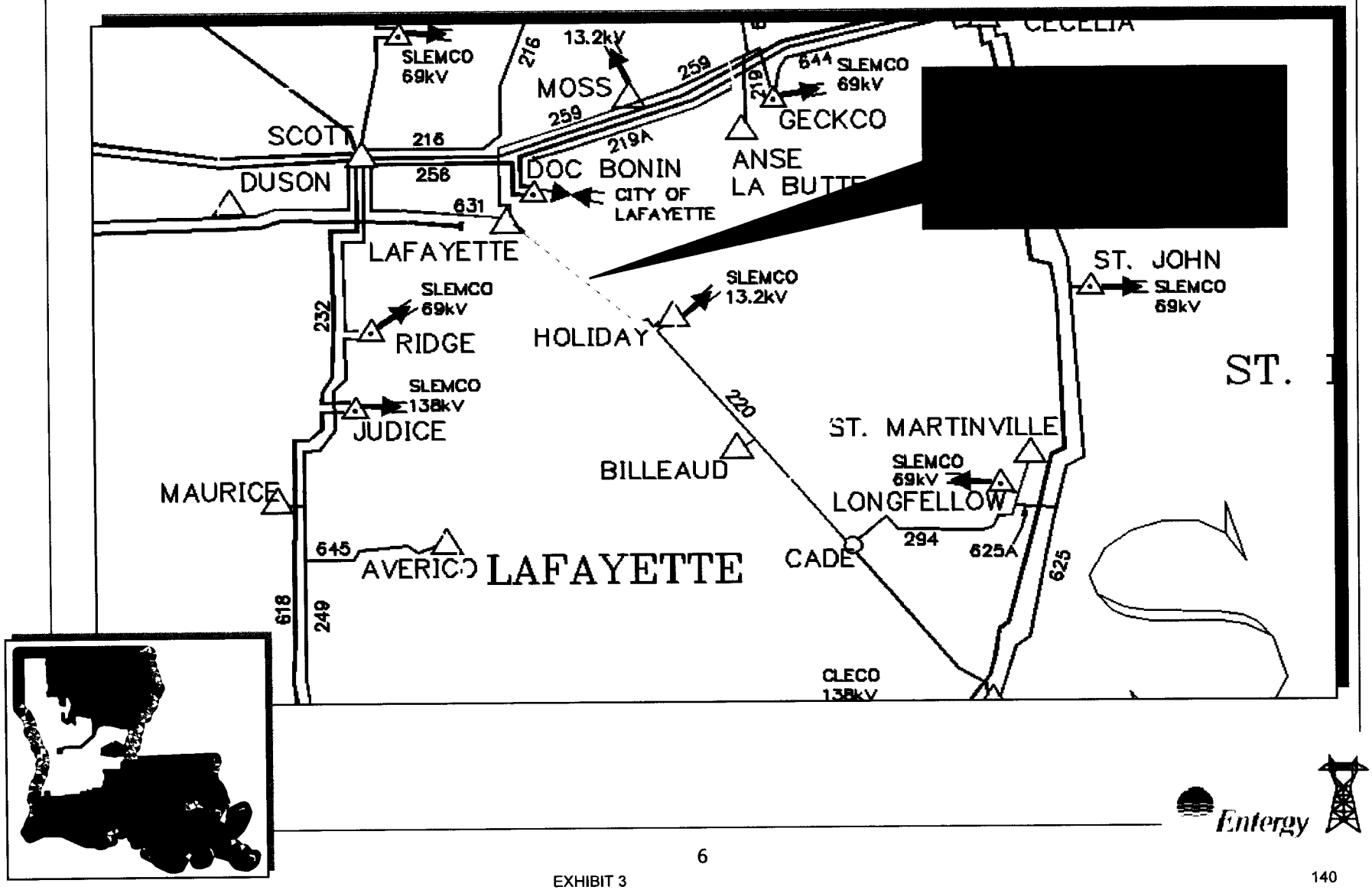
**Recommended Solution:**

- Replace 4.89 miles of 1- 4/0 Cu on the Lafayette-Holiday 69 kV line with a conductor rated at least 106 MVA of capacity.
- Proposed In-Service Date: 2008

**Estimated Cost: $3.9 MM**

Entergy

# 69 kV Lafayette-Holiday Line Upgrade






Entergy

# Nesser Substation: Install 69kV 15 MVAr capacitor bank

**Scenario:**

- Nesser is on a long radial tap on the Harelson-Jones Creek 69kV line. Nesser substation is experiencing rapid growth of over 6%/year. Peak loading is over 45 MVA.
- For the loss of Harelson-Nesser tap, voltage at Nesser drops below acceptable level.

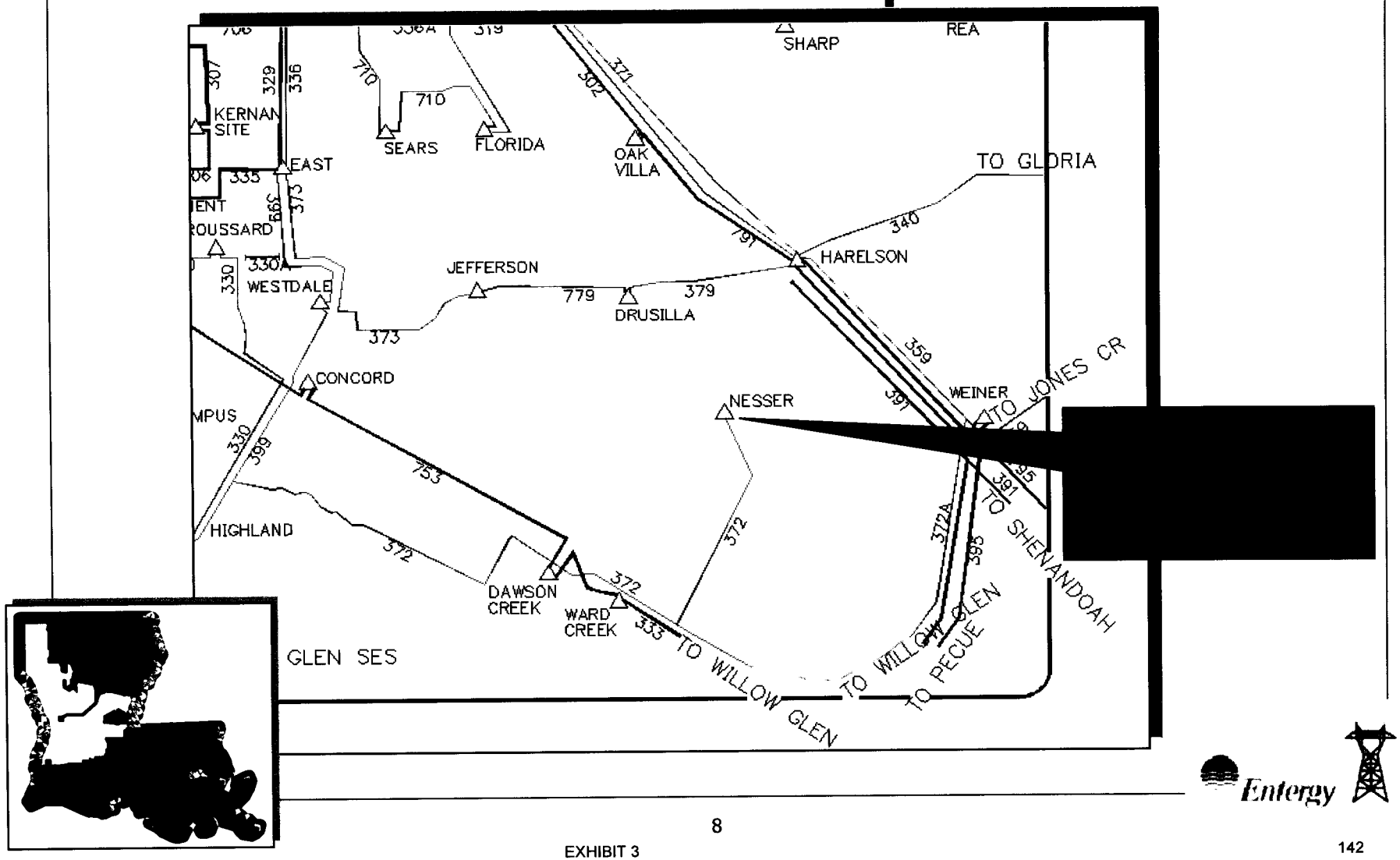
**Recommended Solution:**

- Install a 15 MVAr capacitor bank at the Nesser Substation. The capacitor platform should be expandable for future growth.
- Proposed In-Service Date: 2007

**Estimated cost: $510 k**

Entergy

# Nesser Substation:
# Install 69kV 15 MVAr capacitor bank



# 69 kV Jackson-Marydale Line Upgrade

**Scenario:**

- The 69 kV transmission system radiating north of Port Hudson substation serves 12 substations.
- Loss of Port Hudson to Sandy Creek to Jackson or Francis to Grant to Port Hudson will overload Jackson-Marydale.

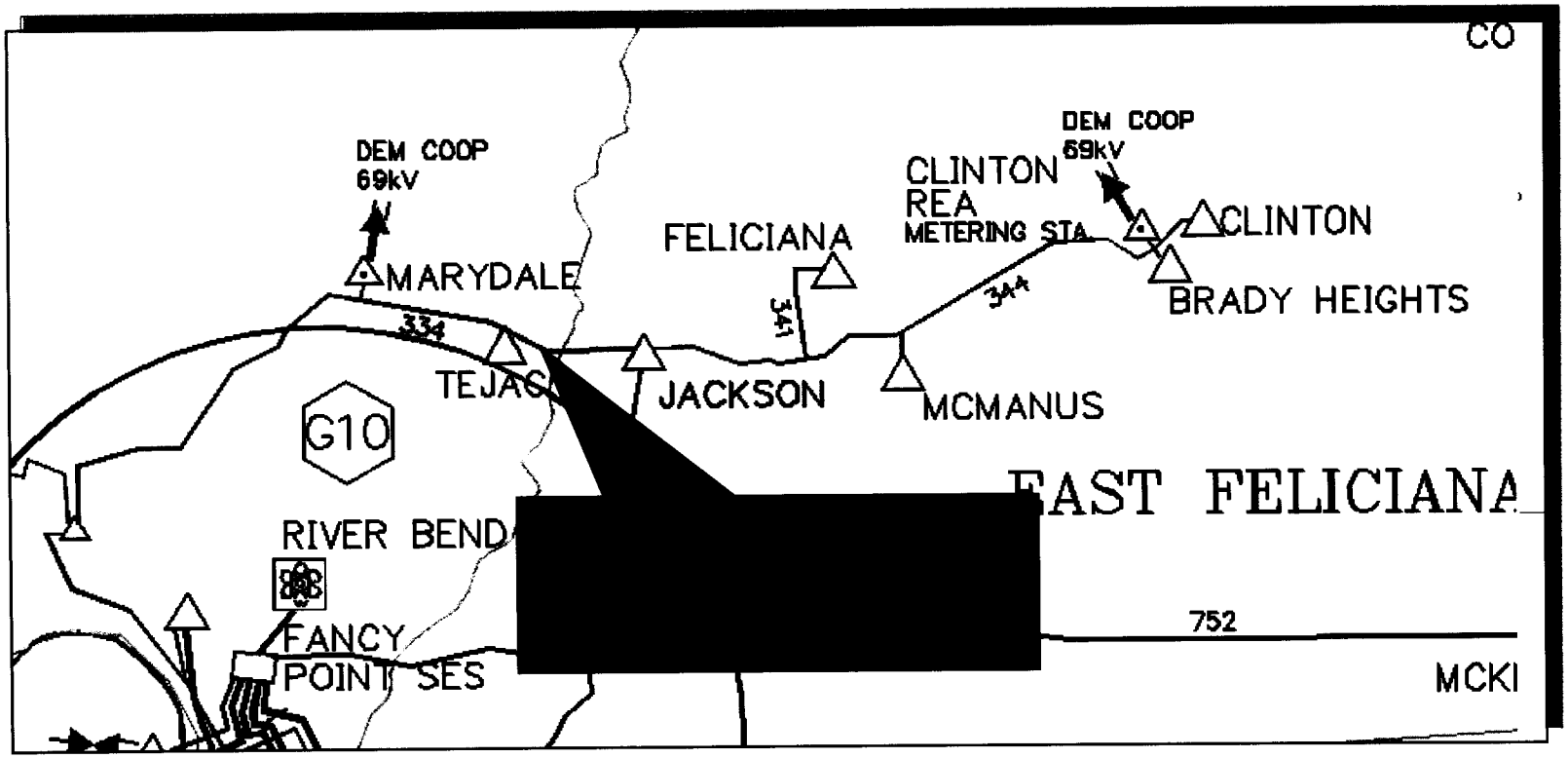
**Recommended Solution:**

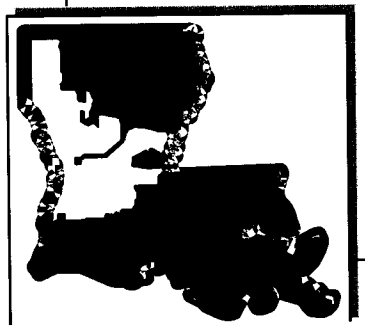
- Replace 5.89 miles of existing 1/0 ACSR conductor with 336 ACSR. Replace all structures and conductor as needed. The reconductor will increase line capacity from 33 MVA to 69 MVA.
- Proposed In-Service Date: 2008

**Estimated cost: $3.6 MM**

Entergy

# 69 kV Jackson-Marydale Line Upgrade



# 69 kV McManus Capacitor Bank Expansion

**Scenario:**

- The 69 kV transmission system radiating north of Port Hudson substation serves 12 substations including McManus.
- Loss of Port Hudson to Jackson 69kV line will cause low voltages at multiple substations.

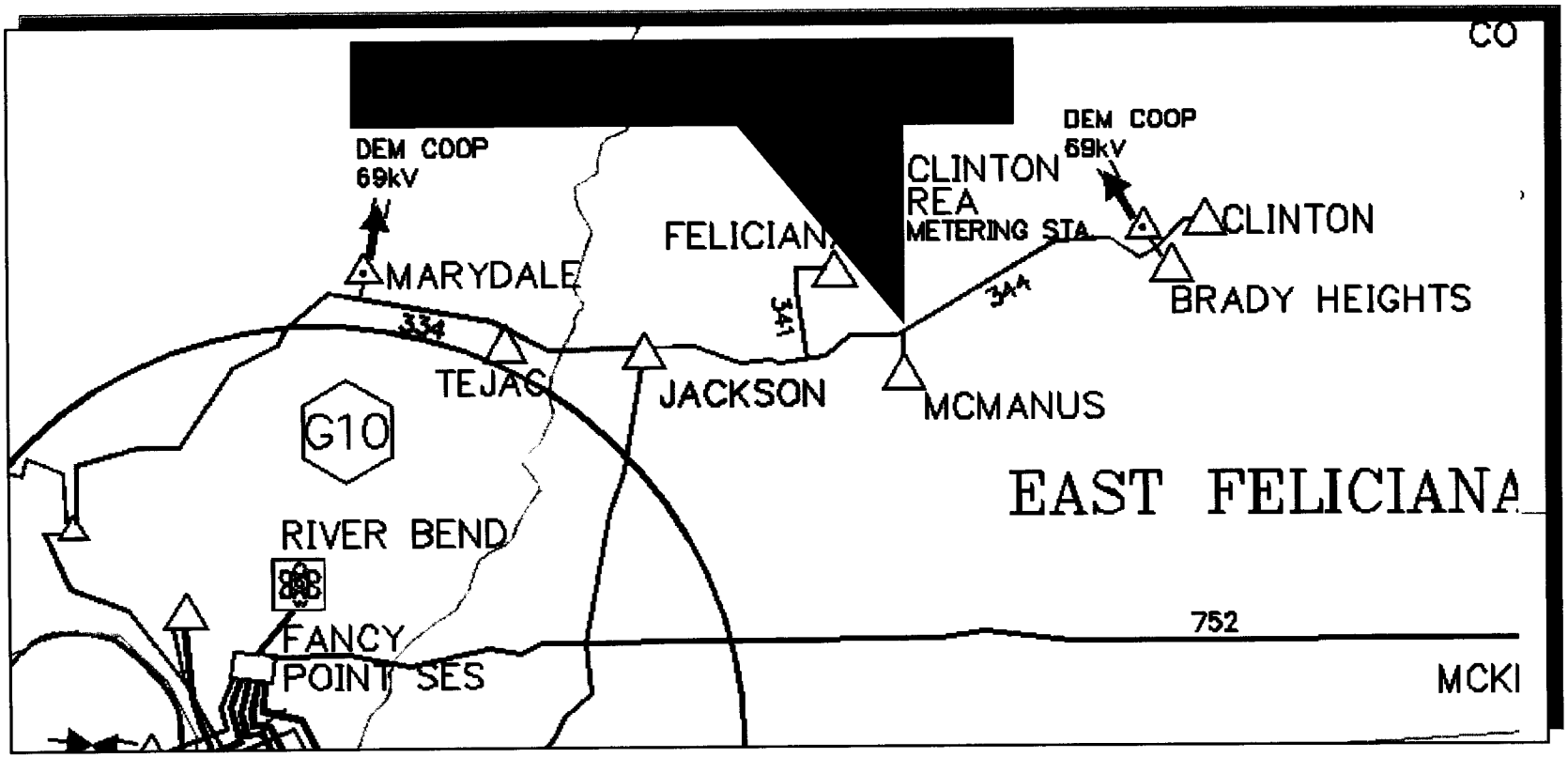
**Recommended Solution:**

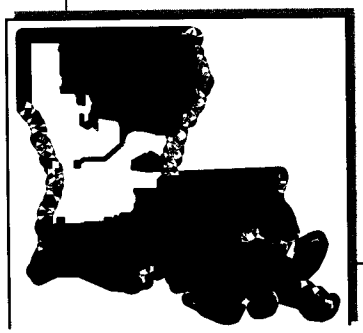
- Install a 6 MVAr capacitor bank at McManus substation for contingencies only. The existing 18 MVAR bank at McManus should be on-line during summer peak.
- Proposed In-Service Date: 2008

**Estimated cost: $510 k**

Entergy

# 69 kV McManus Capacitor Bank Expansion



# Alchem - Monochem: Upgrade 138 kV Line

**Scenario:**

- Alchem to Monochem 138kV line overloads for the loss of any segment of the 230kV line Vulchlor-Woodstock-Belle Helene-Licar-Polscar-Willow Glen.

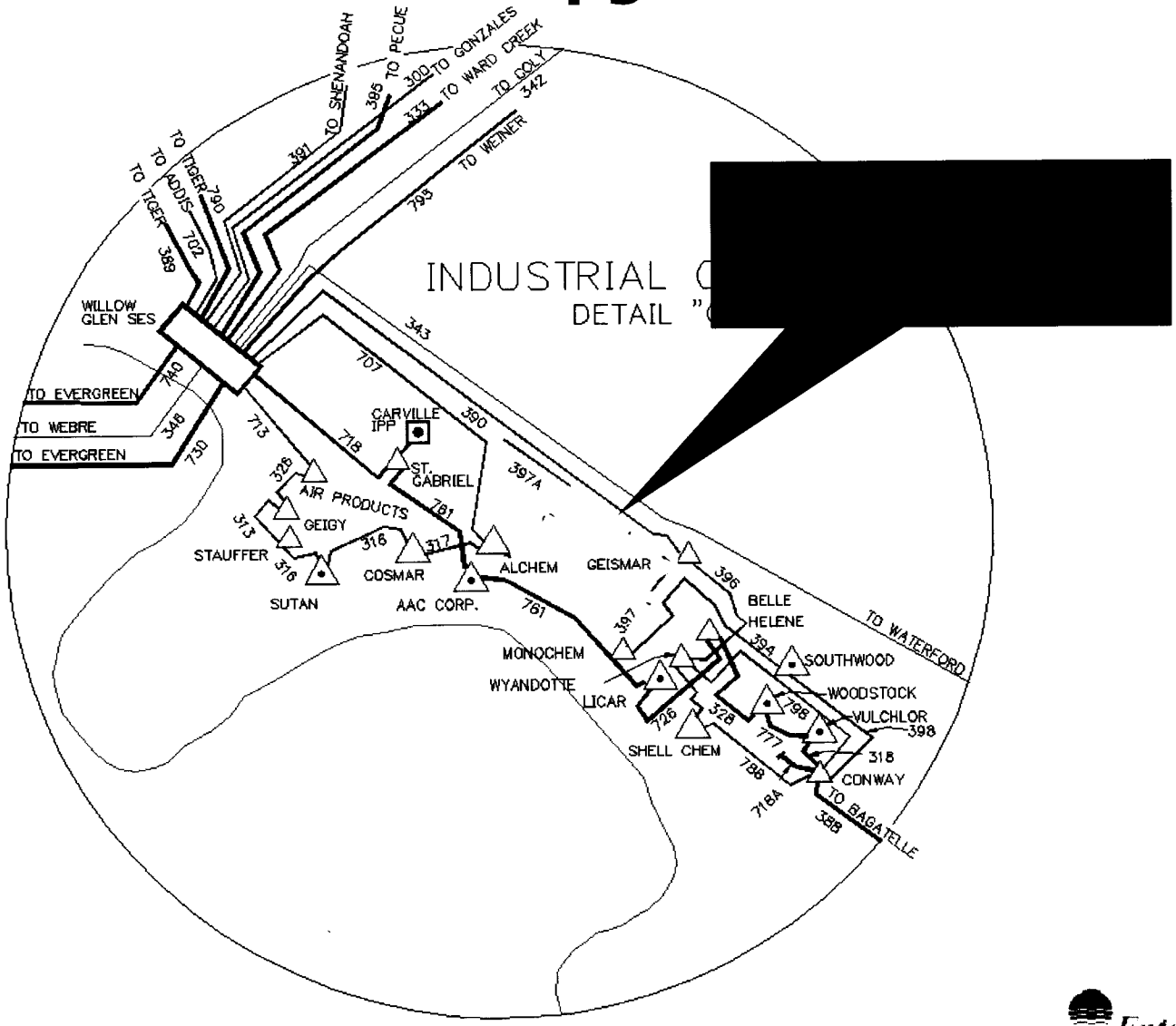
**Recommended Solution:**

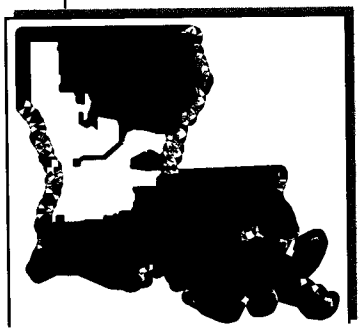
- Replace 6.76 miles of 336 ACSR with a conductor rated at least 380 MVA of capacity.
- Proposed In-Service Date: 2009

**Estimated cost: $4.5 MM**

Entergy

# Alchem - Monochem: Upgrade 138 kV Line



Entergy

# EGSI-LA Breaker Upgrades

**Scenario:**

- Based on asymmetrical fault current analysis, various circuit breakers have been identified as underrated.

**Recommended Solution:**

- Replace the identified underrated circuit breakers with appropriately sized breakers. (List in order of priority)
  - **Mossville 138kV # 17970**
  - **Scott 138kV #'s 8820, 17100 & 8825**
  - **Carlyss 69kV #'s 7840 & 8775**
  - **Nelson 138kV # 7990**
  - **Coly 69kV #'s 20375, 20365 & 20370**
  - **Esso 230kV #'s 20080, 20085, 20090**
  - **Nelson 230kV # 27105**
  - **Scott 69kV # 8860**

Entergy