TRANSMISSION LINE & SUBSTATION PROJECTS

COMPANY:ELL

CUSTOMER: PID 222

FACILITIES STUDY

EJO # F4PPLA0300

PID 222 GENERATOR INTERCONNECTION

Revision: 7

Rev	Issue Date	Description of Revision	Project Manager	Program Manager
A	3/3/09	Initial Draft for team input	BCM	-
B	3/27/09	Construction input	BCM	-
C	4/6/09	PM issue for JET approval	BCM	RG
D	4/13/09	Add 115kV yard Scope. Reissue to JET.	BCM	RG
E	4/29/09	Remove 115kV yard Scope	BCM	RG
0	4/29/09	Issue to TPD	BCM	RG
1	5/4/09	Implement TPD and Planning Comments	WLL	BW
2	8/4/09	Interconnect Cost Comment Added, ERIS/NRIS Cost Distinction	BCM	RG
3	8/18/09	Identify Base Plan & Supplemental Cost	BCM	RG
4	9/8/09	Updated Interconnection Cost	BCM	RG
5	9/28/09	TPD Review	Rick Bewley	Brian Warwick
6	10/21/09	ICT 2nd Review and Classification	BEF	JDH
7	1/13/12	Addendum A addition – Material Modification Review and Upgrade Scope/Cost Estimate	EC	BR

TABLE OF CONTENTS

1. PROJECT SUMMARY

1.1. Background and Project Need

All data contained in this document supports the request of the Southwest Power Pool (SPP) on behalf of the Customer to evaluate PID 222.The customer intends to replace 2 steam turbines with 2 new combustion turbines connected at Entergy's 115 kV Ninemile substation and install 1 steam turbine connected at Entergy's 230 kV Ninemile substation. The study evaluates connection of 570 MW to the Entergy Transmission System.

The facilities study identifies any transmission constraints resulting from the requested power transfer. The facilities study also includes cost estimates to correct any transmission constraints.

This connection will require the following scope of work to eliminate the constraints identified below:

- **Construct a new 230kV transmission line from Bayou Steel to Tezcuco.**

The Belle Point-Little Gypsy 230kV transmission line overloads for the loss of the Waterford-Tezcuco-Frisco 230kV transmission line. Also, the Waterford-Tezcuco 230kV transmission line overloads for the loss of the Belle Point-Little Gypsy 230kV transmission line. To alleviate these constraints, construct approximately 10 miles of 230kV line rated at 642MVA (741A) from Bayou Steel to Tezcuco.

- **Construct a new 230kV transmission line from Webre to Wells.**

The Terrebonne-Greenwood-Humphrey-Gibson 115kV, Gibson-Ramos 138kV, and Livinia-Wilbert 138kV transmission lines overload for the loss of the Webre-Wells 500kV transmission line. Also, the Terrebonne-Greenwood-Humphrey 115kV transmission line overloads for the loss of the Richard-Wells 500kV transmission line. To alleviate these constraints, construct approximately 39 miles of 230kV line rated at least 700MVA (1,757A) from Webre to Wells.

  - The scope and estimates for a new 230 kV terminal at Wells 230 kV substation will be developed by Cleco.

- **Upgrade line equipment at Michoud 115kV substation.**

Replace 1 breaker (9803) with an interrupter rating of at least 51kA.

- **Acadiana Load Project**

The projects included in the Acadiana Load Pocket Project are listed below. This project has been proposed in the 2009-2011 Entergy construction plan and has an expected in-service date of 2012. The project is to be funded by Entergy Gulf States Louisiana, L.L.C., Cleco Power, L.L.C., and Lafayette Utilities System. CLECO's portion of the Acadiana Load Pocket Project – Phase 1 has been identified as a

supplemental project in a previous confirmed Facilities Study (CLECO OASIS request number 72310136).

Scope and estimates for facilities have been already been performed by each responsible party. Therefore, only scope and estimates for facilities responsible by Entergy will be provided in this facilities study.

Scope and Estimates by Entergy:

- Construct facilities for a new 500kV line terminal at the existing Richard 500kV substation.
- Construct facilities for a new 138kV line terminal at the Moril 138kV substation.
- Construct a 230kV line rated at 906MVA from Labbe 230kV to Sellers Road 230kV using new ROW.
- Construct facilities and procure equipment for a new 400MVA, 230/138kV autotransformer, a 230kV line terminal, and a 138kV line terminal at the existing Meaux substation.
- Construct a 230kV line rated at 439MVA from Sellers Road 230kV to Meaux 230kV using new ROW.
- Construct facilities for a new 500kV line terminal at the existing Wells 500kV substation.

Scope and Estimates by Cleco and Lafayette Utilities:

- Build a new Richard 230kV substation with a 230kV line terminal and a 500/230kV autotransformer connected to the existing Richard 500kV station. The Richard 500/230kV autotransformer is sized to at least 560MVA.
- Build a new Sellers Road 230kV substation with (4) 230kV line terminals. This substation will be constructed near where the Judice-Meaux 138kV and Habetz-Flanders 138kV lines cross. Four 230kV transmission lines will tie into this substation from Richard 230kV, Segura 230kV, Labbe 230kV, and Meaux 230kV.
- Build a new Segura 230/138kV substation with a 230kV line terminal, a 230/138kV autotransformer, and a 138kV line terminal to Moril 138kV. The Segura 230/138kV autotransformer is sized to at least 500MVA.
- Construct a 230kV line rated at 830MVA from Richard 230kV to Sellers Road 230kV.
- Construct a 230kV line rated at 830MVA from Sellers Road 230kV to Segura 230kV.
- Construct a 138kV line rated at 500MVA from Segura 138kV to Moril 138kV.
- Construct facilities for a new 500/230kV autotransformer and a 230kV line terminal at the Wells substation. The new Wells 500/230kV autotransformer is sized to at least 560MVA.
- Construct facilities for three new 230kV line terminals at the Labbe 230kV substation.
- Construct a 230kV line rated at 880MVA from Wells 230kV to Labbe 230kV.
- Construct facilities for a new 230kV line terminal at the Bonin 230kV substation.
- Construct a 230kV line rated at 655MVA from Bonin 230kV to Labbe 230kV.

1.2. Scope Summary

- The overall scope of this project is summarized below. Refer to the Scope Summary Diagram/Area Map (Attachment B) for a system arrangement.
  - ***Bayou Steel to Tezcuco 230 kV Transmission Line:*** Construct new 10.4 mile 230 kV transmission line
  - ***Webre to Wells 230 kV Transmission Line:*** Construct new 39.7 mile 230 kV transmission line
  - ***Sellers Road to Labbe 230 kV Transmission Line:*** Construct new 14.4 mile 230 kV transmission line
  - ***Meaux to Sellers Road 230 kV Transmission Line:*** Construct new 10.4 mile 230 kV transmission line
  - ***Richard Substation:*** Install 500 kV terminal
  - ***Meaux Substation:*** Install 450MVA Autotransformer
  - ***Moril Substation:*** Install 138 KV line terminal
  - ***Sellers Road (CLECO) Substation:*** Build new 230 kV substation
  - ***Wells Substation:*** Install 500 kV line terminal
  - ***Webre Substation:*** Install 500/230 kV autotransformer
  - ***Bayou Steel Substation:*** Construct new Bayou Steel 230 kV substation
  - ***Michoud Substation:*** Replace 115 kV breaker
  - ***Tezcuco Substation:*** Install 230 kV line bay
  - ***Little Gypsy Substation:*** Install line trap for Little Gypsy-Bayou Steel 230 kV transmission line
  - ***Ninemile Substation:*** Modifications for New Generator Interconnection

1.3. Cost Summary

- The estimated total project cost is **$226,641,000.** This cost does not include Tax Gross Up which may apply. This is a good faith 20% estimate based on current conditions and the time frame allowed to complete the study.
- The ICT has assigned **$74,940,000** as Base Plan upgrades and **$151,701,000** as Supplemental Upgrade based on Attachment "T" of Entergy's ICT (Independent Coordinator of Transmission) filing to the FERC.

1.4. Schedule Summary

- A summary task schedule is provided for establishing a path forward; however, Entergy does not guarantee completion of a project on the targeted or any other In-Service Date (ISD).
- Based on the proposed task duration with a start date of 5/1/2009, the overall project ISD is expected to be **12/1/2012.** The task durations and proposed ISD will be confirmed during project scoping and definition.
- Refer to section 7.0 of this document for a more details description of project tasks and schedule durations.

1.5. Automatic Generation Control

- Upgrades required by Entergy for AGC service are discussed in Entergy's OASIS posting "Entergy Transmission Guidelines for Automatic Generator Control Applications". See link below:

http://oasis.e-terrasolutions.com/documents/EES/AGC%20Guidelines%20for%20Entergy%20Transmission.pdf

1.6. Long Lead and Major Material/Equipment

Quantity	Material Description	Lead Time, weeks
SUBSTATION: Richard		
1	500kV 3000A 40kA Breaker	26
2	500kV 3000A Disconnect Switches w/ motor operator	20
1	Breaker Control Panel	15
1	Bus Differential Panel	15
1	500kV CCVT	24
SUBSTATION: Moril		
2	138kV 3000A 40kA Gas Circuit Breaker	20
1	138kV 1200A Circuit Switcher Series 2040	22
3	138kV 2000A Disconnect Switches	18
1	138kV 1200A Disconnect Switches	18
1	Line and Breaker Control Panel	15
1	Breaker Control Panel	15
1	Dual Bus Differential Panel	15
1	DFR Expansion	20
1	Metering Panel	14
SUBSTATION: Meaux		
3	Single phase autotransformers 230/138kV 100/133/167MVA	82
1	230kV 3000A 40kA Gas Circuit Breaker	22
2	138kV 3000A 40kA Gas Circuit Breaker	20
2	230kV 2000A vertical break disconnect switch	20
1	138kV 2000A vertical break disconnect switch	18
1	Line and Breaker Control Panel	15
1	Breaker Control Panel	15
1	Transformer Differential Panel	15
1	230kV CCVT	30
1	138kV CCVT	30
SUBSTATION: Wells		
1	500kV Gas Circuit Breaker	32
SUBSTATION: Webre		
4	Single phase autotransformers 500/230kV 140/175/233MVA	82
3	500 kV Gas Circuit Breaker	32

1	230 kV Gas Circuit Breaker	22
9	500 kV vertical break disconnect switch	22
2	230 kV vertical break disconnect switch	22
1	500 kV CCVT	30
1	230 kV CCVT	30
SUBSTATION: Bayou Steel		
4	230 kV Gas Circuit Breaker	22
8	230 kV vertical break disconnect switch	22
12	230 kV CCVT	30
SUBSTATION: Michoud		
1	115 kV Gas Circuit Breaker	20
SUBSTATION: Tezcuco		
2	230 kV 3000A Gas Circuit Breaker	22
4	230 kV vertical break disconnect switch	22
3	230 kV CCVT	30
SUBSTATION: Little Gypsy		
1	230 kV line trap	30
1	230 kV CCVT	30
SUBSTATION: Ninemile		
2	115 kV vertical break disconnect switch	22
TRANSMISSION LINE: Bayou Steel - Tezcuco		
116	Poles	18
116	Vibratory Steel Caissons	18
218,716 lbs	Conductor 954 ACSR Cardinal	20
36,162 m	OPGW 24 Fiber	24
426+	230kV Insulator Assemblies	18
TRANSMISSION LINE: Webre-Wells		
435	Poles	18
435	Vibratory Steel Caissons	18
946,856 lbs	Conductor 954 ACSR Cardinal	20
134,171 m	OPGW 24 Fiber	24
1440	230kV Insulator Assemblies	18
2	Lattice Towers, River Crossing	30
79,257 lbs	3070 kcmil 140/91 for River Crossing	36
TRANSMISSION LINE: Seller's Road - Meaux		
114	Poles	18
85	Vibratory Steel Caissons	18
212,584 lbs	Conductor 954 ACSR Cardinal	20
35, 148 m	OPGW 24 Fiber	24
447	230kV Insulator Assemblies	18
TRANSMISSION LINE: Seller's Road - Labbe		
157	Poles	18
157	Vibratory Steel Caissons	18
429,185 lbs	Conductor 954 ACSR Cardinal	20
48,667 m	OPGW 24 Fiber	24
708	230kV Insulator Assemblies	18

2. SAFETY REQUIREMENTS

Safety is a priority with Entergy. Safety will be designed into substations and lines. The designs will be done with the utmost safety for personnel in mind for construction, operation, and maintenance of the equipment.

All employees working directly or indirectly for Entergy shall adhere to all rules and regulations outlined within the Entergy Safety manual. Entergy requires safety to be the highest priority for all projects. All Entergy and Contract employees must follow all applicable safe work procedures.

Should the work contained within this Facility Study be approved, a detailed Safety Plan will be formulated and incorporated within the project plan.

Each substation that construction will occur in has a valid 911 Address.

Any time contract resources will be requested to complete any portion of this project, those contractors will have to be pre-qualified by Entergy Safety Department and Supply Chain. Due to a project of this nature, it is highly advisable to use contractors with a past positive history on Entergy system.

No hot work is planned for this project.

Project Management and Construction will work closely with distribution to determine if outages can be taken at any location where it is required to install the new transmission line over an existing distribution line. If outages cannot be taken, a possible solution upon project team approval would be to bury the distribution line at each crossing. If due to customer constraints this option is eliminated, then construction will be required to contact safety to discuss methods of installation. Construction will also be required to devise a plan with layers of contingency to protect the workers from the hazards associated with these activities.

As a part of the request for proposal for line construction, a full time safety specialist will be required as a part of this project.

3. GENERAL ASSUMPTIONS

- Upon execution of a Large Generator Interconnection Agreement (“LGIA”) between Customer and Entergy, Entergy will prepare a detailed project execution plan.
- All permits will be attainable in a reasonable period.
- Due to timing and/or funding constraints, site visits, surveys, and soil borings were not performed in order to develop this facility study.
- All costs above represent good faith estimates in today’s dollars. Price escalation for work in future years has not been included.

- Applicant will need to meet Entergy Specifications including MP3901 Generation Interconnection Requirements and MI0301 Transmission Metering Application Standards.

4. SCOPE OF WORK

4.1. Bayou Steel to Tezcuco 230 KV Line: Construct New Line

General Scope:
Build approximately 10.7 miles of new 230kV line using tubular steel tangent structures and single pole angle and dead-end structures. 100' Right of Way is required for the entire length. Steel tangents will use vibratory socket pile foundations. The steel single pole angle and deadend structures will use base-plated pile foundations.

Single 954 ACSR 45/7 "Rail" conductor with fiber optic (24) OPGW shield wire will be used for the entire line length.

Quantity	Material Description	*Lead Time (weeks)
116	Steel Poles	18
116	Vibratory Steel Caissons	18
218,716 Lbs	954 ACSR "Rail" Conductor	20
36,162 meters	24 fiber OPGW	24
426	Insulators 230kV	18

Assumptions:

- Applicable environmental permits can be obtained in a reasonable period
- Crossing permits can be obtained in a reasonable period
- ROW can be purchased along the new route
- 500' average spans used in estimate
- Estimated route length is 10.7 miles
- No outages will be required during the construction of the line. Only outages to tie in the substations will be required
- Estimated material costs are based on today's costs. Material adjustments may need to be made in the future as costs of steel, aluminum, and other components vary.

4.2. Webre to Wells 230 KV Line: Construct New Line

General Scope:

Build approximately 39.7 miles of new 230kV line using tubular steel tangent structures and single pole angle and dead-end structures. 100' Right of Way is required for the entire length. Steel tangents will use vibratory socket pile foundations. The steel single pole angle and dead-end structures will use base-plated pile foundations. Two lattice

towers and their foundations for the Atchafalaya river crossing will also need to be installed.

Single 1272 ACSS 45/7 “Bittern/ACSS” conductor with fiber optic (24) OPGW shield wire will be used for the entire line length.

Quantity	Material Description	*Lead Time (weeks)
435	Steel Poles	18
435	Vibratory Steel Caissons	18
946,856 Lbs	1272 ACSS “Bittern/ACSS” Conductor	20
134,171meters	24 fiber OPGW	24
1440	Insulators 230kV	18
2	Lattice Towers River Crossing	30
79,257 Lbs	3070 kcmil 140/91 for River Crossing	36

Assumptions:

- Applicable environmental permits can be obtained in a reasonable period
- Crossing permits can be obtained in a reasonable period
- ROW can be purchased along the new route
- 500’ average spans used in estimate
- Estimated route length is 39.7 miles
- No outages will be required during the construction of the line. Only outages to tie in the substations will be required
- Estimated material costs are based on today’s costs. Material adjustments may need to be made in the future as costs of steel, aluminum, and other components vary.

4.3. Meaux to Sellers 230 kV Line: Construct New Line

General Scope:

Entergy is to design and construct approximately 10.4 miles of 230kV Transmission line on new 100’ right-of-way with a rating of 439MVA (954 ACSR). (29) Steel self-supporting dead-ends and large angles will be used with base plated caisson foundations. (85) Steel tangents and small angles will be used with socketed pile caisson foundations.

Single 1954 ACSR “Cardinal” conductor with fiber optic (24) OPGW shield wire will be used for the entire line length.

Quantity	Material Description	*Lead Time (weeks)
114	Steel Poles	18
85	Vibratory Steel Caissons	18
212,584 Lbs	954 kcmils ACSR "Cardinal"	20

35,148 meters	24 fiber OPGW	24
447	Insulators 230kV	18

Assumptions:

- Applicable environmental permits can be obtained in a reasonable period
- Crossing permits can be obtained in a reasonable period
- ROW can be purchased along the new route
- 500' average spans used in estimate
- Estimated route length is 10.4 miles
- No outages will be required during the construction of the line. Only outages to tie in the substations will be required
- Estimated material costs are based on today's costs. Material adjustments may need to be made in the future as costs of steel, aluminum, and other components vary.

4.4. Sellers Road to Labbe 230 kV line: Construct New Line

General Scope:

Entergy is to design and construct approximately 14.4 miles of 230kV Transmission line on new 100' right-of-way with a rating of 829MVA (1590 ACSS). (54) Self-supporting steel dead-ends and large angles will be used with base-plated caisson foundations. (103) Steel tangents and small angles will be used with socketed pile caisson foundations.

Quantity	Material Description	*Lead Time (weeks)
157	Steel Poles	18
157	Vibratory Steel Caissons	18
429,185 Lbs	1590 ACSS "Lapwing/ACSS" Conductor	20
48,667 meters	24 fiber OPGW	24
708	230kV Insulators	18

Assumptions:

- Applicable environmental permits can be obtained in a reasonable period
- Crossing permits can be obtained in a reasonable period
- ROW can be purchased along the new route
- 500' average spans used in estimate
- Estimated route length is 10.4 miles
- No outages will be required during the construction of the line. Only outages to tie in the substations will be required
- Estimated material costs are based on today's costs. Material adjustments may need to be made in the future as costs of steel, aluminum, and other components vary.

Transmission Line Construction:

- Once project approval has been completed, a more detailed construction schedule will be completed. See duration schedule in Section 7.0 for the current planned course of action.
- Construction will depict multiple access areas along the proposed line route. Construction will need to work closely with ROW/Vegetation group to ensure proper environmental regulations are being met. This may require but is not limited to silt fence installations, construction entrance installation, and any other BMP (Best Management Practices) to ensure compliance with any environmental requirements.
- All interfaces between Entergy and separate utilities will need to be closely coordinated. Entergy has requested that any time there is a tie point between Entergy and outside utility, Entergy will install the first structure outside of the substation to provide a smooth transition when it comes time to tie in the newly constructed assets.
- ROW acquisition will be imperative to complete the installation of the transmission line. Durations provided in the estimate must be granted to ensure project success.
- No temporary re-routes for distribution and/or transmission facilities have been estimated as a part of this project.
- It is assumed that no specialized equipment shall be required to complete the construction.
- Lay-down yards may be required at several locations along the proposed line route. These lay-down yards will be secured 100% of the time while construction materials and equipment are present.
- The assumed line route dictates installing transmission lines over energized distribution and transmission facilities. All possible alternatives should be considered before proceeding in this direction. It should also be known that if no other alternative can be established to mitigate this hazard, Entergy safety shall be contacted to discuss these methods in order to get proper approval to install this conductor over the energized crossing. It has been requested that if no other alternative is present, that Transmission line design incorporate the installation of dead-end structures at each side of the hot line crossing.

4.5. Richard Substation: Install 500kV Terminal

General

- Install a new terminal at the Richard 500kV ring bus. The terminal will serve a new 500/230kV autotransformer owned by Cleco.
- Richard 500kV substation is designed to be a 6-breaker ring bus, currently it has two lines and two autotransformers connected.
- To add a new terminal, Entergy will install one breaker, two disconnect switches and new bus up to the common fence with Cleco.
- Cleco will build a new 500/230kV substation adjacent to the Richard 500kV yard on the northwest corner of the Richard property. See attachment

- Cleco will own the 500kV autotransformer disconnect switch and this will be the interconnection point.
- A survey for Richard Substation has been requested to locate the property corners, substation facilities and surrounding structures and utilities (above and below ground) on state plane coordinates.
- Entergy has a servitude on the Richard site. The assumption for this portion of the project is that Cleco will be able to use part of the site to build the new 230kV substation.
- Entergy reviewed the layout of the proposed Cleco 230kV substation and line routing and verified there will be no interference should Entergy decide to terminate a new 500kV line to Richard. (See proposed layout on drawing "Richard_CLECO-ALP Layout.pdf".
- Reference Drawings: G8168SO5

Site

- All Entergy related work will take place inside the existing fence.
- Restore crushed rock on all areas disturbed by construction with the addition of approximately 400 tons of limestone.

Foundations

- Install foundations for the following equipment:
  - (1) Potential device
  - (12) High bus supports
  - (1) 500kV Breaker (foundation to be poured around existing low bus support foundation, designer to verify requirements for breaker foundation)
  - (1) Demarcation Junction Box
  - (1) Shield wire structure
- Install 700' of Conduit (240' for two switches, 200' for one breaker and 260' for Potential Device)
- 115' of cable trough (70' for breaker and 35' to extend existing trough to tie to Cleco)
- Install 1100' of copper to connect all new structures and equipment to ground
- Assume new foundations will reflect the design of existing foundations at Substation. No soil borings are required for detailed design.

Electrical

- Remove (12) insulators and (12) bus adapters installed on existing switch supports
- Remove (3) low bus supports and (3) insulators to make room for new breaker
- Install the following electrical equipment:
  - (2) 500kV 3000A disconnect switches with motor operator
  - (1) 500kV 3000A 40kA Breaker. Designer to verify the X/R ratio of the station to specify the appropriate rating for the breaker.
  - (12) High bus supports

- (1) Potential device pedestal
- (J) Shield wire structure (125' J structure or equivalent)
- (30) 500kV Insulators
- 500' of bus with corona hardware and damper conductor

Relay

- Install 1 new breaker control panel in the older control house
- Install 1 new MOS control panel in the older control house
- Install 1 new 500kV bus differential panel with primary and backup SEL-487B relays
- Install 1 new Demarcation Junction Box at the fence line between the Entergy and CLECO yards
- Install 1 new 500kV CCVT
- Install 1 new CCVT junction box
- Install 1 new RTU cabinet adjacent to existing RTU cabinet in newer control house. The existing cabinet has a removable side wall to accept another cabinet.
- Install 3 additional RTU S cards in the new RTU cabinet
- Upgrade the RTU with a MEII kit
- Install 1 fiber modem and fiber-optic patch panel in the new RTU cabinet
- Install fiber-optic cabling between Entergy's new RTU cabinet and Cleco's control house for RTU serial communication. Cleco will provide a data port from their RTU to Entergy's RTU for data exchange.
- Install 1 new Orion 5R communication processor. All ports on the existing SEL-2032 are being used. Interface all new relays to the Orion 5R.
- Install additional DC breakers on DC panel in the newer control house. The relay designer should consider separating the DC between the trip #1 and trip #2 circuits in the new 500kV breaker. DC panel #3 in the older control house has 14 spare 30A breakers.
- The existing DFR has plenty of spare analog and digital channels, so no DFR expansion is necessary.
- No AC panel expansion should be required in the control house. The relay designer should evaluate the AC power requirements and determine if a new outdoor AC Panel is needed in the 500kV yard to serve the new 500kV breaker, switches, and yard lights.
- Cleco will install and own the billing metering in their 230kV yard on the low side of their new autotransformer. Entergy will not install any billing metering. Cleco will give us demand data via the serial RTU communication link.
- The relay designer should evaluate using #8 AWG wiring for all CT's circuits because of the distance between the control house and the new 500kV equipment. All wiring to the 500kV switchyard should be shielded.
- Modify the Nelson 500kV line relaying to accommodate the new 500kV breaker

- The relay designer should setup an electrical interlock scheme between the new 500kV breaker, existing 500kV breaker 13000, and the new Cleco 500kV switch on the high side of the autotransformer. Cleco's new 500kV switch should not operate unless the two 500kV breaker are opened first.

Relay Settings

- Develop new breaker failure settings (SEL-351) for the new 500kV breaker
- Develop new bus differential relay settings (SEL-487B) for the new 500kV ring bus node
- Modify Nelson 500kV line relay settings to accept the new 500kV breaker
- Study and apply Regulatory and Entergy Standard compliance for setting revisions and setting updates
- Perform limited classical relay impact studies on affected lines and buses from remote stations
- Model the new Cleco 230kV Sellers Road Line and the new 500/230kV Auto Transformer, connected to Entergy Richard 500kv Substation, into ASPEN ® OneLiner based on Transmission Plans and Profiles Acadiana Load Pocket Improvements Project
- Develop new relay settings and prepare setting test plans for 500kV Sellers Road Nodal Bus Differential Panel per Entergy Standard PM0602. The setting scheme will be SEL487B option C and ERLPhase BPro Option A.
- Develop new relay settings and prepare setting test plans for 500kV Breaker Control Panel per Entergy Standard PM0501. The setting scheme will be SEL351-7 all options.
- Revise Z3 and possibly upgrade relay firmware for Wells-Richard 500kV L347 SEL421/SEL311L
- Revise Z3 and possibly upgrade relay firmware for Nelson-Richard 500kV L620 SEL421/ SEL321
- Revise settings for existing 500kV Breaker Control Panel 13000, 13070 and 13415
- Revise settings for existing 500/138kV Auto Transformer No.1 and No. 2 Back up relays
- Revise settings and possibly upgrade relay firmware for Richard- Wells 500kV L347 SEL421/SEL311L
- Revise settings and possibly upgrade relay firmware for Richard –Nelson 500kV L620 SEL421/ SEL321
- Provide off site/ on site setting supports during construction for setting database issues, relay software and firmware compatibility
- Perform setting logistics such as relay date base (.rdbs or mdbs), relay viewable document (.xls) , project work folders for Web posting (DOCUMENTUM), relay modeling in ASPEN®
- Perform relay settings corrections and issue new "as built" settings based on returning "as left" settings

Communications and SCADA

- Develop new RTU configuration to include the new equipment and new data being received from Cleco
- Splice new fiber-optic cabling in the patch panel new RTU cabinet

Metering

- Cleco will own all billing metering in their 230kV switchyard; the metering will not be on the 500kV side

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.6. Meaux Substation: Install 450MVA Autotransformer

General

- Install a new 230kV line terminal and a new 138kV terminal in order to connect a new 450 MVA 230-138kV autotransformer bank. All new substation facilities will be designed to a minimum of 2000Amps capacity.
- Additional property is required; the existing site cannot accommodate the addition of the 230kV equipment and autotransformer. The property expansion proposed consists of extending the fence line towards the east 155’ with the new property line with a 3’ offset from the fence.
- The 230kV equipment is arranged based on a future 4-breaker ring-bus configuration with standard low profile steel structures

- The autotransformer bank installation proposal is based on the Jacinto 230/138kV 750MVA transformer bank installation. Spacing and structure size were reduced for a smaller size bank.
- A three-phase transformer option was considered; the single-phase transformer bank was the preferred alternative chosen by Planning so that Lewis Creek and Meaux can share the spare transformer (to be installed at Lewis Creek Substation)
- The new autotransformer will tie to Bus No. 2
- Tying the new autotransformer to Bus No. 1 was considered but discarded after detailed review of the connections and work involved. A tie to Bus No. 1 requires the replacement of 138kV tie breaker 17460 and switches 17459 and 17461 as well as the physical conductor from Bus No. 1 to No. 2.
- A detailed topographic survey will be required prior to the site design
- Reference Drawings: G8160SO5

Site

- In order to complete the required work at Meaux Substation, the existing site will be expanded 155 ft. to the East. The expansion area will be about 1.65 acres. Due to the site expansion being over an acre a SWPPP will need to be prepared prior to bidding out the construction packages to insure the contractors are aware of expectations. The SWPPP should be developed by a qualified contractor. It will be assumed that the drainage through out the expansion will be surface runoff. A site survey will be required prior to final design. There is a drainage swale traversing the property. This swale will need to be relocated along the new east property line. Also, the land owner adjacent to the substation started to dig a borrow pit on the property Entergy is looking to purchase for the expansion. The pit was dug approximately 30’ by 100’ by 5’. This area will need to be filled to the proper elevation for the expansion of the substation.
- The site work required is as follows:
    - 3,733 cubic yards of stripping top soil
    - 11,200 cubic yards of fill (Raise site about 2’ above existing grade)
    - 3,733 tons of limestone
    - Removal of 480 ft of existing fence
    - 1.65 acres of soil to be sterilized
    - Soil testing
    - SWPPP
    - 4,000 cubic yards of hauling and disposal of spoil dirt
    - Install 740 ft of new fencing
    - Install 1,000 ft of new access road
    - Relocated 500 feet of drainage swale
    - 800 cubic yard of fill to bring the borrow pit to the proper elevation.
- As part of the front-end loading activities, a wetlands delineation study for the expansion of Meaux Substation has been requested

Foundations

- Install foundations for the following 230kV Equipment:
  - (3) Single-phase autotransformers
  - (1) Autotransformer bank structure – 8 footings/piers
  - (5) Single-phase low bus supports
  - (3) Three-phase low bus supports
  - (3) Low switch supports
  - (1) Transmission line dead end structure
  - (1) Transformer dead end structure
  - (1) Breaker
  - (2) Potential Device Pedestals
  - (1) Shield mast
- Install foundations for the following 138kV Equipment
  - (4) Instrument transformer pedestal (3 CTs and 1 CCVT)
  - (1) Breaker
- Conduit and cable trough:
  - Install 220ft of poured in place cable trough: the trough will tie to the existing pullbox outside the control house and run E-W towards the autotransformer bank
  - Install two pullboxes: these boxes will tie all the new 230kV equipment to the cable trough with 4” or 6” conduit.
  - Install 2700ft of conduit
- Grounding
  - Tie all new equipment to the ground grid per the latest Entergy standard. All above grade connections to use copper clad conductor.
  - Perimeter Ground: existing fence is tied to the ground grid but does not have a perimeter ground, new perimeter ground will be installed during this project due to the increased capacity. New construction will include perimeter ground.
  - Estimated ground conductor required: 4300ft
- No soil borings are required for the Meaux expansion since the designer will use existing records on file to develop the foundation design

Electrical

- Build 230kV bay to tie new autotransformer to existing 138kV bus. The new bay will be oriented N-S and extended South towards the autotransformer bank. This bus extension to tie to the autotransformer via strain bus terminated on the west side at the transformer bank structure and on the east side on a transformer dead-end structure. The 230kV area will be designed based on a 4-breaker ring bus configuration but built only with the equipment and structures necessary for the autotransformer installation
- Install the following 230kV equipment:
  - (3) Single phase autotransformers 230/138kV 100/133/167MVA

- (1) Autotransformer bank structure
- (2) Firewalls
- (1) Transmission line dead-end structure
- (1) Transformer dead-end structure
- (2) Potential device pedestals
- (3) Low switch support – one structure to be used as a bus support
- (2) 230kV 2000A vertical break disconnect switch
- (1) Ground switch – installed in the line switch
- (1) 230kV 3000A 40kA gas circuit breaker
- (3) Low-bus three-phase bus support
- (5) Low-bus single-phase bus support
- (1) Shield mast – designer to determine if additional shielding structures are required to protect the new transformer
- Install 1,700ft of rigid bus (230kV)
- Install 300ft of strain bus for the 230kV autotransformer tie to the rigid bus.

- Install the following 138kV equipment
  - (4) Instrument transformer pedestals (three for metering CTs and one for a bus potential device)
  - (1) 138kV 2000A vertical break disconnect switch - new autotransformer breaker.
  - (1) 138kV 3000A gas circuit breaker – new transformer breaker
  - (1) TA-W steel truss (replaces existing TA-N truss) TA-W allows installation of a disconnect switch for the new breaker. Designer to review elevation of this truss and elevation of additional trusses required to ensure adequate clearances and no interference with existing equipment.
  - Install 2000ft of 1000MCM copper conductor as specified on oneline diagram (G8160SO5). Bundled conductor estimated, design engineer to review and determine which jumpers need to be modified (upgraded, disconnected, etc)
  - Replace all cap and pin insulators affected by bus upgrade (approximately 12 – used as bus supports)

Relay

- Install (1) 230kV Line/Breaker Control Panel. Option B2 (POTT with fiber) of Entergy standard PM1803 Rev 00 for the new 230kV breaker.
- Install (1) Autotransformer Differential Panel to include (2) SEL-387 differential relays
- Install (1) NEMA 4X stainless steel Autotransformer Junction Box. Approximate dimensions should be 60” wide by 48” tall. All wiring from the 3 single phase autotransformers should be brought to this box at terminated in an orderly

manner. All wiring from the control house should be brought to this junction box.

- Install (1) 138kV Breaker Control Panel for the new 138kV breaker
- Install (3) 230kV CCVT 0.6WXYZ accuracy
- Install (1) NEMA 4X stainless steel 230kV Single Phase CCVT junction box
- Install (1) 138kV CCVT 0.6WXYZ accuracy
- Install (1) NEMA 4X stainless steel 138kV Single Phase CCVT junction box
- Install (1) Orion 5R communication processor
- Install (2) RTU S cards
- Install (1) RTU MEII kit
- Replace the existing Dual 138kV Bus Differential Panel 5 with a new Dual 138kV Bus Differential Panel with SEL-487B relays and lockout relays only. This new panel should also have the same controls and a BF timer for Bus Tie Breaker 17460 similar to existing panel 5. The panel will be installed in the panel 3 slot, and once it is wired completely, field personnel will remove existing panel 5 and slide the new panel into the panel 5 slot. The auxiliary PT on the back of the existing panel 5 will need to be relocated to the appropriate line panel that needs the open delta potential. (Please note: The SEL-487B relay will be a standard relay, but the panel design will be non-standard. The relay designer will need to design this panel before ordering it. The relay designer can use the Bus Differential Panel at Michoud as an example.) Please note that the synch panel presently attached to Panel 5 will need to be temporarily relocated until the new Bus Diff Panel is completely installed.
- Pull new control cables from Panel 5 to new 138kV bus tie breaker 17460
- Pull new power & alarm cables to new bus tie breaker 17460
- Install approximately 6 new AC breakers to the stand alone AC panel
- Install approximately 8 new DC breakers to the stand alone DC panel
- The existing battery set is adequate and does not need replacement. A battery calculation was performed assuming a worst case scenario of tripping bus #1 after an 8 hour loss of station AC power. The calculation showed available margin in the battery capacity.

Relay Settings

- Develop settings for the new 230kV line relays (SEL-421 and SEL-311L)
- Develop settings for the new 230kV & 138kV breaker failure relays (SEL-351)
- Develop settings for the new autotransformer differential relays (T-Pro, SEL-387, and SEL-351)
- Develop settings for the two new bus differential relays (SEL-487B)
- Perform Relay Impact Study to determine if other relays in the area need to be reset
- Study and apply Regulatory and Entergy Standard compliance for setting revisions and setting updates

- Perform limited classical relay impact studies on affected lines and buses from remote stations
- Model the new Cleco 230kV Sellers Road Line and the new 138/230kV Auto Transformer No. 4, connected to Entergy Meaux 138kV Substation, into ASPEN ® OneLiner based on Transmission Plans and Profiles Acadiana Load Pocket Improvements Project specific
- Develop new relay settings and prepare setting test plans for 230kV Sellers Road Line and Single Breaker Control Panel per Entergy Standard PM1803. The setting scheme will be SEL421 modified Option B2-2 /SEL311L option B2-1.
- Develop new relay settings and prepare setting test plans for 230-138kV Auto Transformer Differential T4 Panel per upcoming Entergy Standard. The setting scheme will be SEL387-6/ ERLPhase TPro/SEL351-7.
- Develop new relay settings and prepare setting test plans for Meaux 138kV Bus No. 1 Differential Panel per Entergy Standard PM0602. The setting scheme will be SEL487B option C.
- Develop new relay settings and prepare setting test plans for Meaux 138kV Bus No. 2 Differential Panel per Entergy Standard PM0602. The setting scheme will be SEL487B option B.
- Develop new relay settings and prepare setting test plans for Meaux 138kV Breaker Control Panel per Entergy Standard PM0501. The setting scheme will be SEL351-7 all options.
- Revise settings for existing 138/69kV Auto Transformer No.1 and No. 2 EM relays.
- Revise Z3 settings for existing 138kV Leblanc-Meaux L228 SEL121F.
- Revise Z3 settings for existing 138kV Judice -Meaux L618 SHPM/CEY.
- Develop new relay settings and prepare setting test plans for 138kV Meaux-Leblanc L228 SEL311C.
- Develop new relay settings and prepare setting test plans for 138kV Meaux-Judice L618 SEL311C.
- Provide off site/ on site setting supports during construction for setting database issues, relay software and firmware compatibility.
- Perform setting logistics such as relay date base (.rdbs or mdbs), relay viewable document (.xls) , project work folders for Web posting (DOCUMENTUM), relay modeling in ASPEN®.
- Perform relay settings corrections and issue new “as built” settings based on returning “as left” settings.

Communications and SCADA

- Modify RTU configuration and host to include new MEII board, new S cards, and new Orion 5R processor
- Install a telecom rack to include fiber optic patch panel and Orion 5R
- Splice 24 singlemode fibers from Seller’s Rd 230kV line OPGW to ADSS in yard

- Splice 24 singlemode fibers from ADSS in yard to patch panel

Metering

- No billing metering is required at Meaux substation

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.7. Moril Substation: Install 138kV Line Terminal

General

- Install a new 138kV line terminal for Cleco's Segura to Moril 138kV Transmission Line. All new substation facilities will be designed to a minimum of 2000Amps capacity.
- The new line bay will result in five transmission lines on one bus. Therefore, a bus tie breaker will be installed and high side protection on T2 as agreed by Transmission Planning.
- Planning model with the new line to Segura was not available during development of this document:
    - Per CLECO, the 230/138kV Autotransformer at Segura will have a top rating of 350MVA (around 1470A @ 138kV). Existing bus at Moril is 750MCM Copper rated for 1050A. Because not all information regarding line capacity and loading is available. Substation designer shall verify line

capacity and loads during design to determine the extent of bus sections to be replaced.

- S&C was consulted with the information available to verify the capability of their circuit switcher to handle the available fault current and secondary faults. Designer shall verify the fault current once the planning model is available.

- Reference drawings: G8171SO5
- Division of ownership is at the terminal pad before the disconnect switch to the breaker

Site

- Reroute 150ft of access road to allow installation of new arresters and line potential device on Segura line
- Approximately 100 tons of limestone will be used to replace limestone in disturbed areas

Foundations

- Foundations for the following 138kV equipment:
  - (2) Breakers
  - (1) Circuit Switcher
  - (1) Line Potential Device Pedestal
  - (3) Arrester Pedestal
- Install 2” Sch. 40 PVC Conduit – 2,500ft total
  - (6) runs per Breaker
  - (3) runs per Circuit Switcher
  - (2) runs for Line Potential Device
  - (2) runs for Bus Potential Device – new conduits for existing set located on Hopkins line
- Install grounding conductor – 600ft
  - Connect new equipment to ground per latest Entergy Standards (all above grade conductor to be copper clad conductor)

Electrical

- Install bus tie breaker in the position below switch 17809
  - (1) 138kV 3000A 40kA Gas Circuit Breaker
  - (1) 138kV 2000A disconnect switch on existing TA-W truss
  - (9) replacement insulators for existing switch 17809
- Segura Line Bay, install the following:
  - (1) TA-W Truss below existing TA-N truss
  - (1) 138kV 3000A 40kA Gas Circuit Breaker – Breaker to include one set of metering accuracy CTs in addition to the standard requirements
  - (2) 138kV 2000A disconnect switch

  - (1) Potential Device Pedestal
  - Replace existing N-S bus section with bundled 1000MCM Copper
- Install the following equipment for the interrupting device for autotransformer #2. Note: exact location of circuit switcher needs to be determined by designer; for scoping purposes it is considered to be located under new TA-W truss
  - (1) 138kV 1200A Circuit Switcher – Series 2040 (designer to determine model based on space constraints)
  - (1) TA-W truss on existing box structure
  - (1) 138kV 2000A Disconnect Switch mounted on TA-W truss
  - Remove of existing Switch 17814 from standalone structure and install insulators to serve as supports for new transformer jumpers from circuit switcher
- Other: reuse existing pedestals for new metering 138kV CVTs
- Total estimated length of bus conductor to be installed or replaced: 1,400ft

Relay

- Install (1) 230kV Line/Breaker Control Panel in the panel 25 slot for the new 138kV line to Cleco's Segura substation. Option B2 (SEL-421/SEL-311L) of Entergy standard PM1803 Rev 00. Relay Designer to consider adding W/V transducers to this new line panel to provide analog data to the Cleco RTU while the SEL relays can provide analog data to the Entergy RTU. Relay designer to coordinate requirements with the metering personnel.
- Install (1) 138kV Breaker Control Panel in the panel 27 slot for the new 138kV bus tie breaker
- Replace abandoned panel 7 with a new Dual Bus Differential Panel with two SEL-487B relays, one for each 138kV bus. Relay designer should lockout relay only option of Entergy standard PM0602 Rev 3. Relay designer should consider tripping the 69kV breaker 17815 for a 138kV bus fault because the new circuit switcher may not be very near the autotransformer. The dual bus differential panel recently installed at Michoud can be used as an example.
- Remove or abandon panel 11 which is the existing 138kV bus differential panel
- Modify existing Panel 15 (autotransformer #2 differential) by removing trips to the 138kV breakers and adding trip to the new 138kV circuit switcher. A 101CS and 43SUPV should be added to this panel for local control of the new circuit switcher.
- Install (1) Stand Alone DC Panel in the panel 22 slot and abandon wall mount panels
- Install (1) Stand Alone AC Panel in the panel 24 slot and abandon wall mount panels
- Expand existing DFR by adding 2nd DFR cabinet and configuring a cross trigger scheme
- Install (1) 200A automatic transfer switch and remove existing manual transfer switch
- Install (1) 138kV CCVT 0.6WXYZ accuracy on the new Segura line

- Install (1) Line CCVT junction box for the new 138kV line to Cleco's Segura substation
- Replace the three existing 138kV Bus PT's on the 138kV north bus with (3) 138kV CCVT's 0.3WXYZZ accuracy for relaying and revenue metering. It is assumed the existing bus PT's are not metering accurate. The relay designer should verify the accuracy class of the PT's before ordering new CCVT's.
- Install (1) Bus PT junction box for new 138kV Bus CCVT's
- Expand Entergy RTU by installing 2 additional S cards for new alarms
- Install (1) new Orion 5R communication processor on RTU rack and connect it to all new SEL relays in the control house
- Install fiber optic patch panel on new 19" rack

Relay Settings

- Develop settings for the new SEL-421/SEL-311L line relays
- Develop settings for the two new SEL-487B bus differential relays
- Develop settings for the new SEL-351 bus tie breaker failure relay
- Perform Relay Impact Study to determine if any other local relays need to be reset
- Study and apply Regulatory and Entergy Standard compliance for setting revisions and setting updates
- Perform limited classical relay impact studies on affected lines and buses from remote stations.
- Model the new Cleco 230kV Segura Line, connected to Entergy Moril 138kV Substation, into ASPEN ® OneLiner based on Transmission Plans and Profiles Acadiana Load Pocket Improvements Project specific.
- Develop new relay settings and prepare setting test plans for 138kV Segura Line and Single Breaker Control Panel per Entergy Standard PM1803. The setting scheme will be SEL421 modified Option B2-1 /SEL311L option B2-1.
- Develop new relay settings and prepare setting test plans for Moril 138kV South Bus Differential Panel per Entergy Standard PM0602. The setting scheme will be SEL487B option C.
- Develop new relay settings and prepare setting test plans for Moril 138kV North Bus Differential Panel per Entergy Standard PM0602. The setting scheme will be SEL487B option B.
- Develop new relay settings and prepare setting test plans for Moril 138kV Bus Tie Breaker Control Panel per Entergy Standard PM0501. The setting scheme will be SEL351-7 all options.
- Revise Z3 settings for existing 138kV Leblanc-Moril L619 SEL121F.
- Revise Z3 settings for existing 138kV Hopkins-Moril L600 EM relays.
- Revise Z3 settings for existing 138kV Cecelia-Moril L225 SEL341/SEL311C.
- Z3 settings for existing 138kV Bayou Warehouse-Moril L223 EM relays.
- Provide off site/ on site setting supports during construction for setting database issues, relay software and firmware compatibility.

- Perform setting logistics such as relay date base (.rdbs or mdbs), relay viewable document (.xls) , project work folders for Web posting (DOCUMENTUM), relay modeling in ASPEN®.
- Perform relay settings corrections and issue new “as built” settings based on returning “as left” settings

Communications and SCADA

- Re-configure Entergy RTU for new analog, digital, and control points
- Develop new configuration for Orion 5R
- Install ADSS from Segura line dead end structure transition splice to the new patch panel in the control house
- Splice 24 single mode OPGW fibers to ADSS at dead end structure splice box and splice 24 ADSS fibers in new patch panel

Metering

- Install new Maxsys Elite meter & DNP surge protector on panel 5 for the new 138kV line to Cleco’s Segura substation.
- Replace the existing JEM-1 meter on panel 5 with a new Maxsys Elite meter & DNP surge protector for the existing line to Cleco’s Hopkins substation.
- Connect both new Maxsys meters to the Entergy RTU and the Cleco RTU via DNP3 protocol.
- All totalizing will be done in the new meters and then sent to the RTU’s.
- Remove existing S-30 relays and related hardware from Panel 5. They are no longer required for pulses to the Entergy and Cleco RTU’s since the DNP3 connections will now provide these signals.
- As with the existing tie, Entergy will own the Meter Equipment. Hopkins and Segura will be totalized. MWH data should be retrievable via dial-up individually and as a totalized value. Totalized hourly MWH data is to be provided via the Cleco RTU. Instantaneous individual analogs (MW/MV) and a totalized instantaneous MW/MV values are to be provided via the RTU. CTOC is to be provided a primary (RTU) and backup signal of the totalized instantaneous values. The backup totalized instantaneous MW is to be brought back via a separate analog channel (as done today). As with other ties discussed above, a dual-ported RTU may be used to coordinate information between the balancing areas. If separate RTUs are used, each could act as the backup to the other.
- Relay designer to coordinate with the substation designer to ensure there are metering accurate CT’s in the new Segura 138kV breaker
- Relay designer to investigate the accuracy class of the existing 138kV north bus CCVT’s to ensure they are adequate for the new metering.

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize

the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.

- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.8. Sellers Road [Cleco]: Build New 230 kV Substation

General

- Cleco will be installing a four breaker ring bus substation.
- Entergy will route the Meaux to Sellers line into the southwest corner of the substation
- Entergy will route the Labbe to Sellers Road line into the northeast corner of the substation
- All new substation facilities will be designed to a minimum of 2000Amps capacity
- Division of ownership is at the terminal pad before the disconnect switch to the breaker
- Entergy will not own any substation devices at Sellers Road. The only Entergy owned assets will be the telecomm equipment.

Site

- Entergy does not have any site work to perform

Foundations

- Entergy does not have any Foundation work to perform

Electrical

- Entergy does not have any Electrical work to perform

Relay

- Entergy does not have any Relay work to perform

Relay Settings

- Entergy does not have any Settings work to perform

Communications and SCADA

- Install two (2) 19" racks for telecomm equipment
- Splice 24 single mode OPGW fibers to ADSS at dead end structure splice box and splice 24 ADSS fibers in new patch panel

Metering

- Cleco will own all metering at Sellers Road

4.9. Wells Substation: Install 500kV Line Terminal

General

- Install a new 500kV line terminal to facilitate the connection of a new Cleco 500-230kV autotransformer. Cleco will install the 560MVA autotransformer. All substation facilities to be designed to a minimum of 2000 amps.
- Wells Substation was designed as a 6-breaker ring bus and during original construction all equipment but the breaker was installed for the future second transformer bank. Breaker and transformer disconnect switches are already in place.
- Refer to Wells S05 drawing

Site

- Contractor to add crushed rock to all disturbed areas during construction. No other site work is required.

Foundations

- Install the following:
  - (1) 500kV breaker foundation
  - (3) Potential Device Pedestals
  - 70' of poured in place cable trough and tie to existing. Note: existing trough is precast; design engineer to check which type of trough will be used.
  - 200' of conduit for potential devices
  - 300' of copperweld conductor to tie breaker poles, cabinet and potential devices to the ground grid

Electrical

- Install 500kV Breaker
- Install (3) potential devices and pedestals

- Install 220’ of bus (from switch terminals to breaker and potential device jumpers)

Relay

- Install one (1) new Breaker Control Panel with SEL-351S relay. (This panel should be a duplicate of the existing breaker control panels). The relay designer should make note that the relaying at Wells performs independent pole tripping of the 500kV breakers.
- Install one (1) new Auto 2 Bus Differential panel with SEL-387E/SEL-587 relays (This panel should be a duplicate of the existing Auto1 Bus Differential panel)
- Install one (1) new 500kV CCVT Bus Potential junction box
- There is presently an Entergy/CLECO demarcation box in CLECO’s control house. This junction is expandable to include relaying for autotransformer 2 similar to autotransformer 1. CLECO will add terminal blocks to this junction box. The Entergy relay designer will need to coordinate the wiring with the CLECO relay design engineer. This box should include the following:
  - Tripping & closing relaying to CLECO
  - Tripping & closing relaying to ENTERGY
  - CT & PT signals associated for autotransformer 2
- Add terminal blocks to the existing station junction box to facilitate cabling to new 500kV GCB, CCVTs, and junction boxes
- Add three (3) SEL-C273A cables from new SEL relays to the existing SEL-2032 communication processor
- Existing RTU has adequate spare analog, digital, and control points for new 500kV breaker and autotransformer bus differential relaying
- Existing DFR has adequate spare digital and analog points for the new 500kV breaker and autotransformer bus differential relaying
- Existing MOS Control Panel is complete for all 500kV motor operated switches
- Connect electrical interlocks between new 500kV breaker and associated 500kV switches similar to existing schemes
- Existing stand alone DC Panel #1 and DC Panel #2 has adequate spare breakers
- Add six (6) 1P30A breakers to existing stand alone AC Panel to accommodate new 500kV breaker and junction boxes
- All control cable leaving the control house should be shielded. The shield should be grounded at one end only similar to existing cable grounding

Relay Settings

- Perform Relay Impact Study
- Develop relay settings for the new SEL-351 breaker failure relay
- Develop relay settings for the new SEL-387E & SEL-587 differential relays

- Perform Relay Impact Study to identify possible changes on all the Entergy owned Wells remote stations.
- Develop new relay settings and prepare setting test plans for the new () 500KV Wells Breaker Control Single Pole Tripping Panel per upcoming Entergy Standard. The setting schemes will include the SEL351-S relay
- Develop new relay settings and prepare setting test plans for the new Wells 500/230 KV autotransformer bus differential panel per Entergy Standards. The setting scheme will include the SEL 387/587Z relays
- Revise existing settings for the 500 KV Wells-Webre line.
- Revise existing settings for the 500 KV Wells-Richard line.
- Revise existing settings for the 500/230 KV autotransformer at Wells.
- Model the new Wells 500/230kV Auto Transformer connected to Entergy CLECO 230 KV Substation, into ASPEN ® OneLiner based on Transmission Plans. Factory test report for the autotransformer is necessary for the modeling portion and it has to be requested to CLECO .
- **The relay settings group is making the assumption that ENTERGY is not responsible for settings on CLECO's 230 KV side, the proper contacts should be arranged to make sure the protection with CLECO is coordinated.**

Communications and SCADA

- Re-configure SEL-2032 communication processor to accept input from the new SEL relays
- Modify the RTU configuration to accept all new analog, digital, and control points
- Re-configure the TOC host and develop new display to include the new 500kV breaker and autotransformer 2. The SOC should be involved since this is another control area (CLECO) is involved.

Metering

- Modify existing meter panel by doing the following:
  - Add Landis & Gyr Elite switchboard meter for autotransformer 2 (The relay designer should make note that the connections to the Elite meter are different than connections to the Maxsys 2510 meter)
  - Add Watt/Var, current, and voltage transducers for backup telemetry for autotransformer 2. This backup telemetry should be wired to the Entergy RTU and to CLECO equipment similar to the existing setup for autotransformer 1.
  - Add test switches if needed
- Replace existing Maxsys 2510 meter for autotransformer 1 with a new Landis & Gyr Elite meter
- Connect both new meters to the RTU and setup a DNP3 connection
- Verify backup tele-metering is functioning properly to CLECO and to Entergy

- Confirm TOC & SOC are receiving their required metering data through SCADA

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.10. Webre Substation: Install 500/230kV Autotransformer

General

- Develop a 500 to 230 kV open air substation next to the existing gas bus.
- Establish a 3 breaker 500 kV open air ring bus with room for a 700 MVA, 500/230 kV transformer bank and one 230 kV breaker to tie the transformer bank 230kV side to the new line from Wells. The 230kV should be set up using the standard transmission breaker and a half layout. This layout can be used first as ring bus and can be expandable to breaker and a half.
- Relocate Willow Glen 500 kV line from existing position to new node on open air 500 kV ring. Vacated node will be the new tie between open air and gas buses.

- Increase relay room or add a new one as required along with additional station service from the new transformer tertiary winding with automatic transfer switch

Site

- Assume site required for substation expansion is owned by Entergy.

- Develop site for the substation expansion:
  - Perform topographical survey

- Clear & grub expansion area, wooded area included (8 acres)
- Implement a storm water management plan
- Add fill material to grade site as required for drainage
- Install limestone surfacing
- Install new fence and remove section of existing
- Install new access roads
- Install concrete piping for drainage (detailed design required for size and quantity)

Foundations

- Install foundations for the following equipment:
  - Single phase transformers with oil containment
  - 500kV breakers
  - 500 kV CVTs, line trap and arrester support structures
  - 500kV high and low bus supports
  - 500kV high and low switch supports
  - Shield-wire towers
  - 500kV Dead-end
  - Transformer firewalls
  - Control House expansion
  - 230kV Dead-ends
  - 230kV switch supports
  - 230kV CVT and arrester support structures
  - 230kV Breaker
  - Transformer bank tertiary bus structures

- Install cable trough and conduit as required for the breakers, instrument transformers, communication equipment and transformer bank on the 500kV and 230kV yards.

- Expand substation ground grid in accordance to latest Entergy and industry standards. Tie existing and new grounding grids. Install 20,000 ft of new grounding including perimeter ground, grounding connections for all equipment and connections to existing grid.

- Other: expand control house foundation.

Electrical

- **500 kV Work:** The 500kV yard will include one four position open air ring bus in a square configuration adjacent to the gas bus and the existing Willow Glen 500kV Line. Initially the ring will include three breakers with three nodes for (1) a tie to the existing gas ring bus, (2) the Willow Glen 500kV Line, and (3) the 500/230kV transformer bank. Relocating the Willow Glen 500kV line to new ring bus will require a new 500kV deadend termination near the current intersection of the Willow Glen Line and the property line as well as bus work from the new deadend to the new ring bus. The bus work on the new Willow Glen termination will require new line switch, ground switch, line trap, and three CVT's. The existing Willow Glenn node connection to the GIS ring bus will be

reconnected to new open air ring bus with bus work. One new CVT will be included in that bus-work. Switch 20597 shall remain. The third node connecting to the 500/230kV transformer bank will include bus-work; disconnect switch, ground switch, and CVT.

- **Transformer Bank:** The transformer bank shall include four single phase transformers each rated 140/175/233 MVA, 500/230kV where (3 x 233 = 700 MVA). The fourth transformer shall be installed as a spare with bus work, capable of connecting to the bus work of any phase. Each transformer will include a tertiary. Each tertiary will be brought out of the transformer and connected in delta with tertiary protection equipment. Arresters shall be installed on the transformers. Bus work shall be installed from the 230kV transformer bushings to a 230kV dead end. Strung bus shall be installed from the transformer bank dead-end to the 230kV yard.

- **230 kV work:** The 230kV yard shall be arranged to install one bay of a breaker an a half scheme. The initial installation will include a 230kV breaker with 230kV dead-ends on both sides. One dead-end will receive the strung bus from the transformer bank; the other dead-end will terminate the 230kV Line to Wells. The breaker will ultimately be in the center position of a breaker and a half bay.

RELAY

- Provide and install primary and back-up protection for new autotransformer tied to the 500kV new three (3) breakers ring bus station and to the new one (1) breakers of the new 230kV Line. Modification required for existing 500kV protection scheme, to operate together with new ring bus scheme.

- Design, purchase, and install a primary/backup autotransformer panel, which includes Nxphase T-pro relay, SEL 387 and SEL 351A relays. The Nxphase T-pro is the autotransformer primary 500/230kV differential protection zone and metering, which wraps from the high side bushing and low side bushing. The SEL 387 is the autotransformer backup 500/230kV differential protection and the backup high side bus differential protection, which wraps from the high side breaker 20XX1 and breaker 20XX2 and the new 500kV Autotransformer low side bushing. The SEL 351A will monitor the tertiary winding and this relay will be used for alarm purposes only. Furthermore, sudden pressure protection is located in this panel.
- Design, purchase, and install a primary autotransformer high side bus differential panel, which includes the SEL 587Z relay is the 500kV bus differential zone of protection from the high side breaker 20XX1 and breaker 20XX2 to the high side bushing of the autotransformer.
- Design, purchase, and install a low side bus autotransformer panel consisting of a SEL 387 relay. The SEL 387 relay will wrap from the high side bushing of the autotransformer to the two new 230kV circuit breakers being installed

creating a low side bus autotransformer zone of protection.
Verify during design phase if an impedance relay protecting from the low side breakers looking past the autotransformer is necessary.

- Design, purchase, and install three (3) breaker control panels for the three new 500kV circuit breakers installed.
- Design, purchase, and install one (1) line/breaker control panel for the new 230kV circuit breakers being installed.
- Design, purchase, and install a primary/backup 500kV bus tie panel, which includes Nxphase B-pro relay, and SEL 487 relays. The Nxphase B-pro is the primary bus 500kV differential protection, which wraps breaker 20564 and breaker 20586 to breaker JXXX1 and breaker JEXX3. The SEL 487 relay is the backup 500kV bus differential protection, which wraps breaker 20564 and breaker 20586 to breaker 20XX1 and breaker 20XX3. Modifications to the existing protection scheme associated with breaker 20564 and breaker 20586 protection to facilitate the new node location, the modification of trips, breaker failure, alarms, and associated document updates to protection scheme.
- Modifications to the existing Willow Glenn line panel protection to facilitate the new node location to breaker 20XX2 and break 20XX3 breakers , the modification of trips, breaker failure, alarms and associated document updates to protection scheme at Willow Glenn Substation
- Modifications to the existing 500kV ring bus panels will be necessary to include the addition of the 500kV breakers.
- Install new D20 RTU with a GE Harris D20-ME board to work with new SEL2032,& Orion.
- Install one (1) Line/breaker control panel (1-240kVbreakers)
- Install three (3) breaker control panels (500kVbreakers)
- Install two gang MOS control panel.
- Install two (2) 500kV Tie Ring Bus Differential Panels (Primary & Backup Bus)
- Install two (2) 500kV primary XFMR bus diff panels
- Install one (1) 500/230kV dual primary/backup XFMR diff panels with Tertiary winding protection.
- Install one (1) 230kV backup bus diff panels XFMR bus diff panels
- Install one (1) AC wall mounted panel
- Install one (1) AC transfer switch
- Install one (1) DC wall mounted panel
- Install two (2) SEL2032 with associated connections
- Install one (1) Orion unit with associated connections
- Install four (4) 500kV CVT's
- Install four (4) 230kV CVT's
- Install one (1) Differential CT junction boxes
- Install three (3) CVT junction boxes (500kV – CVT)
- Install two (2) CVT junction boxes (230kV – CVT)
- Install one (1) Battery set 125V DC (58cells)
- Install one (1) Battery rack
- Install one (1) Battery Charger
- Install one (1) DC switching panel
- Install one (1) fiber optic splice box

- Install eight (8) SEL 2505 – fiber optic I/O
- Install one (1) 500kv – 3000amp PLC trap
- Install one (1) PLC tuner
- Install one (1) lot of Shielded Control Cable ,Control Cable and fiber optic cable
- Autotransformer and Breaker Control, indication, alarms, and analog will have to be wired up, configured, and programmed for the RTU.
- Upgrade DFR panel to accommodate new autotransformer

Relay Settings

- Develop new relay settings and prepare setting test plans for 230kV Wells line and Breaker Control Panel per Entergy Standard PM1803. The setting scheme will be SEL421/SEL311C
- Develop new relay settings and prepare setting test plans for the new (3) 500KV Webre Breaker Control Panels per Entergy Standard PM0501. The setting schemes will be SEL351-7 all options.
- Develop new relay settings and prepare setting test plans for the Webre 500/230/13.8 kV Auto Transformer Differential Panel per upcoming Entergy Standard. The setting scheme will be SEL387-6/ ERLPhase TPro/SEL351-A.
- Develop new relay settings and prepare setting test plans for the Webre 500 KV bus tie panel per Entergy Standard. The setting scheme will include the Nxtphase B-PRO and SEL-487B relays
- Perform Relay Impact Study to determine if other relays in the area need to be reset (fault detectors, alarms, distance protection, etc) or if they need to be changed out.
- Perform ground overcurrent study on affected lines at Webre and on all remote stations for coordination
- Study and apply Regulatory and Entergy Standard compliance for setting revisions and setting updates.
- Model the new Webre-Wells 230 KV Line and the new 500/230kV Auto Transformer connected to Entergy Webre 500kV Substation, into ASPEN ® OneLiner based on Transmission Plans. Factory test report for the autotransformer is necessary for the modeling portion.
- Develop new relay settings and prepare setting test plans for the Webre 500/230 KV autotransformer high side bus differential panel per Entergy Standard PM0602. The setting scheme will include the SEL 587Z relay
- Develop new relay settings and prepare setting test plans for Webre 500/230 KV autotransformer low side bus differential panel per Entergy Standards. The setting scheme will include the SEL 387 relay providing differential protection from the high side bushing of the autotransformer to the two new 230kV circuit breakers on the low side bus..
- Revise existing settings for the 500 KV Webre-Wells line.
- Revise existing settings for the 500 KV Webre-Willow Glenn line.
- Revise existing settings for the 500 KV Webre-Big Cajun line.

- Provide off site/ on site setting supports during construction for setting database issues, relay software and firmware compatibility.
- Perform setting logistics such as relay date base (.rdbs or mdbs), relay viewable document (.xls) , project work folders for Web posting (DOCUMENTUM), relay modeling in ASPEN®.
- Perform relay settings corrections and issue new “as built” settings based on returning “as left” settings.

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.11. Bayou Steel 230 KV Substation: Construct New 230KV Substation

General

- The layout of this substation will be very similar to the Panama Switching Station near the Sunshine Bridge.
- The Bayou Steel 230 kV switchyard will be a four-element ring bus, expandable to six elements built on a green field site. The existing Little Gypsy – Bayou Steel 230 kV line will be cut into this station and a new line from Bayou Steel will be constructed to Tezcuco 230KV substation on alternate nodes (in different bays). The two remaining nodes will be used to serve Bayou Steel at 230 kV.

- A soil boring will be done and a geotechnical investigation will be completed prior to the start of design to ensure proper foundation design. A soil resistivity study will also be done for ground grid design.
- There are no planned deviations from the normal design package organization. Design will be done in-house.

Site

- The proposed site will be 366' by 348'. It is assumed to be constructed on property provided by Bayou Steel. Assume Entergy will have to build an access road. This roadway will be a new 20' wide limestone roadway to the entrance of the substation. The sub-grade elevation of the roadway will be about 6" above existing grade with geotextile fabric and 12" of crushed limestone on top of it.

- A topographic and boundary survey will be needed in order to properly design the site. However, this information will not be completed and processed prior to completing the scope document. Therefore, certain assumptions will be made in order to complete the scope and estimate. Two concrete monuments will need to be set in order to provide control for design and construction.

- A soil boring and resistivity study will be needed in order to adequately design the foundations. These borings have not been taken. We will be assuming pile supported foundations for all structures, breakers, etc. The following information will be needed in the soil report:
- The soil borings shall include, but not limited to, site development and grading, excavation and trenching, shallow and deep foundation recommendations, soil resistivity and boring logs. More detail information will be provided to the soil boring contractor to ensure we receive the proper information in the soil report.

- All appropriate environmental assessments, permits and licenses will need to be obtained prior to construction. It is assumed that the proposed substation location is not wetlands.

- The site will be approximately 2.93 acres. A SWPPP will be needed. This plan will be contracted out to a qualified contractor. The project manager shall ensure this work is completed prior to the start of the bid process. This will allow the contractors bidding on the work to understand and plan for our expectations.

- The elevation of the site is unknown at this time. It will be assumed that the site will need to be stripped 12" below existing grade and the site will need to be elevated about 4 feet above exiting grade. The Base Flood Elevation (B.F.E.) in this area is unknown at this time. We will assume that the additional 4 feet of fill will bring the site to at least the B.F.E. Once additional information is obtained on the B.F.E. and the final grade elevation can be revised.

- Due to the lack of soil boring and survey information the following quantities are based on assumptions. The drainage in the station will be subsurface drainage and will drain towards an open ditch. We will elevate the site approximately 4 feet above the existing grade to bring the site to the proper grade. It is assumed that heavy grubbing will be needed and the vegetation will need to be stripped from the top surface. In order to provide enough area to taper the final grade of substation back to the existing grade, additional land will be needed. This has been accounted for in the area stated above. Also, we will have a large amount of spoil to remove during the site and foundation construction. It is assumed that spoil removed during site and foundation installation can not be used as structural fill and spread across the site. Entergy will need to perform a phase 2 environmental soil testing. This sampling will need to take place before construction begins to ensure that the proposed site is not contaminated and the contractor performing the work will know what will be expected in order to dispose of the spoil. Until soil testing has been completed an accurate estimate for disposing of the spoil will not be feasible.

    - 2 EA Topographic and boundary survey
    - 4 EA Soil borings (for design purposes)
    - 1 EA Soil resistivity test
    - 1 EA Environmental impact study, permits and licenses
    - 1 EA SWPPP
    - 1 EA Soil Testing (for phase 2 environmental testing)
    - 7094 CYD Stripping 12” of top soil
    - 2.93 ACRE Heavy grubbing to consist of tree and stump removal.
    - 35470 CYDStructural fill (Raise site 4 feet above existing elevation)
    - 8 EA 3’x3’ Catch Basins
    - 1050 FT 18” diameter concrete culverts
    - 150 FT12” diameter culvert to be placed in ditches that cross under the access road to the Substation.
    - 2.93 ACRE Soil Sterilization
    - 1120 FT Substation access road
    - 6000 FT Access driveway into the substation
    - 6222 CYD 12” Stripping of top soil along proposed roadway
    - 9333 CYD 12” of fill along proposed roadway
    - 7094 TON Limestone surface
    - 3684 TON Stabilize Soil (#125 Man Size Rip Rap)
    - 1240 FT 7’ fence with 1’ of barb wire with up to eight isolation panels
    - 8100 CYD Hauling of Spoil Dirt
    - 11000 TON Disposing of Spoil Dirt

Foundations

- The foundations for this substation will be pile-supported with concrete caps. The estimated number and type of piles are 246 (each) 50’ “Class B” wood piles.

- Install six (6) 230 kV Gas Circuit Breakers Foundations, two with provisions for a lally column to be installed initially.
- Install eight (8) 230 kV Low Switch Support Foundations
- Install four (4) 230 kV High Switch Support Foundations
- Install two (2) 230 kV A-Frame Dead End Foundations
- Install two (2) 230 kV 10AS Dead End Foundations
- Install sixteen (16) 230 kV Single Phase Low Bus Support Foundations
- Install sixteen (16) 230 kV Single Phase High Bus Support Foundations (two high bus supports will be installed on a "future" breaker foundation)
- Install one (1) SSVT Support Foundation
- Install twelve (12) 230 kV CCVT Support Foundations
- Install twelve (12) 230 kV Line Arrester Support Foundations
- Install one (1) Control House Foundations
- Install 528 feet of Poured-In-Place Cable Trough
- Install two (2) 125' Static Mast Foundations
- Install one (1) Demarcation Box Foundation
- Install twelve (12) Yard Light Foundations
- Install six (6) 230 kV CT Support Foundations
- Install 528 feet of poured-in-place trough (as shown in Attachment F).
- Install 3000 feet of two-inch schedule 40 PVC conduit to all equipment as required per Entergy specifications
- Install 5700 feet of #4/0 ground wire for the main grid plus 1200 feet of 19#9 copperweld for above ground connections to equipment. This assumption is based on installing approximately forty foot square meshes and a 20% allowance for equipment and fence connections.

Electrical

- Bayou Steel Substation will be built as a ring bus, consisting of two north-south bays and two east-west bays. The Little Gypsy and Tezcuco lines will terminate in the north-south bays and the bus elevation will be twenty feet above concrete. The two lines to Bayou Steel will terminate in the east-west

bays and the bus elevation will be thirty feet above concrete transitioning to twenty feet above concrete between the main ring and the Bayou Steel line disconnect switches.

- Each north-south bay will consist of the following equipment (north to south):
  - Two (2) short lally columns
  - Four (4) 230 kV 3000 A vertical break switches, one (1) with a ground switch
  - One (1) 60-foot type “B” A-frame dead end tower
  - Three (3) 230 kV CVTs beneath the line terminal
  - Three (3) CVT pedestals
  - Three (3) 192 kV, 152 kV MCOV station class arresters beneath the line terminal
  - Three (3) arrester pedestals
  - One lot of four-inch schedule 80 T6-6063 aluminum tubing with damper cable
  - One lot of (2) 1780 kcmil Chukar ACSR for flexible connectors to breakers.
  - One lot of (1) 954 kcmil Magnolia AAC for flexible connectors to CVTs and arresters
  - One lot of grounding material per Entergy standards
  - All lally columns are counted as part of the east-west below.
  - One (2) 230 kV trap, suspended in “A” frame with appropriate jumpers.

- Each east-west bay will consist of the following equipment (east to west):
  - One (1) 10AS tower (at west end)
  - Three (3) 21-foot switch stands, two w/ insulator supports (no switches, future use)
  - Nine (9) tall lally columns, (three in place of a future breaker)
  - Eight (8) short lally columns
  - Three (3) 230 kV CVTs beneath the line terminal
  - Three (3) CVT pedestals, on the Bayou Steel terminal
  - Three (3) 192 kV, 152 kV MCOV station class arresters beneath the line terminals
  - Three (3) arrester pedestals
  - Three (3) 230 kV metering CTs, on the Bayou Steel terminal. These CTs will require an in-line 35 kV insulator to route current through the CT.
  - Three (3) CT pedestals
  - One (1) junction box for fiber termination, mounted on the 10AS tower leg
  - One (1) lot of four-inch schedule 80 aluminum tubing
  - One (1) lot of (1) 954 kcmil Magnolia AAC for flexible conductors.
- The east ends of the east west bays will be constructed in a staggered manner such that it can be expanded in the future to form two additional line terminals if

it becomes necessary. No structures required for future expansion will be installed on these nodes at this time.

- The substation will be shielded by the shield wires of the incoming Little Gypsy and Tezcuco lines and by two 125-foot shield mast on the opposite side of the south bus.
- All structures and equipment will be grounded per Entergy specifications.
- All above-grade conduit will be flexible 2" PVC to junction and control boxes, except to CVTs and CTs, which will be 1-1/2" flexible PVC.
- There will be one (1) 50 kVA SSVT mounted on a pedestal beneath the Bayou Steel #1 line terminal to provide primary station service. It will be placed on B phase to match the backup distribution station service source.
- The backup station service will come from a single-phase 8 kV lateral extended from the highway. It will be an overhead lateral extended to an overhead transformer outside of the fence and extend 120/240 V single phase service underground to the substation. A 200 A fused disconnect switch will be mounted on the pole outside of the fence.
- The estimate allows for twelve (12) 400 W free standing single yard lights around the perimeter of the yard.
- There will be one telephone de-mark box outside of the fence at the gate.
- A control house will be installed, measuring 20 feet by 42 feet with one battery room.

Relay

- The scope of this project is to construct approximately 9 miles of 230kV line rated at 642MVA (741A) from Bayou Steel to Tezcuco substation. With the addition of 200MW at Ninemile 115/230kV substations, the Belle Point-Little Gypsy 230kV transmission line overloads for the loss of the Waterford-Tezcuco-Frisco 230kV transmission line. In addition, the Waterford-Tezcuco 230kV transmission line overloads for the loss of the Belle Point-Little Gypsy 230kV transmission line. To alleviate these constraints this new line will be constructed.
- Presently Bayou Steel substation is customer owned and is served from a radial 230kV line out of Little Gypsy substation. Bayou Steel has four transformers connected to this line. Each transformer has a circuit switcher as its high side device. The proposal is to build the station into a four-breaker ring bus. Two nodes of the bus will connect to Little Gypsy and Tezcuco lines and the remaining two nodes will connect to Bayou Steels transformers, two transformers per node.
- Bayou Steel substation is presently be metered on the line coming into substation. With the new substation configuration, remove the existing metering instruments on the line and install new metering instruments, CT's and CCVT's at each transformer node.
- Entergy standard line panels will protect the lines leaving the substation. Bayou Steel to Tezcuco substation line will have OPTGW in the shield position. This will allow fiber optic communication between the relays on this line. Add an Unblocking Carrier scheme to the existing Little Gypsy line. Coordinate with

relay settings group to establish a carrier frequency for this line. Add Three CCVT's to each line terminal, Little Gypsy and Tezcuco.

- Install a bus differential scheme at each transformer node. The differential scheme will include the two 230kV breakers and the customer's transformers. Designer must check these transformers to check the availability of spare CT's in the transformers. Bayou Steel will be responsible for the protection of their transformers.
- Build a new control house to accommodate the relay control panels. Coordination with the telecom group will be required to accommodate the communication needs at the substation.

- Purchase, design and install one (1) Entergy standard line/breaker panel with unblocking carrier, SEL 421 primary, SEL 311C backup relays on the Little Gypsy to Bayou Steel Line panels. Coordinate with the relay settings group to develop a carrier frequency for this line
- Purchase, design and install one (1) Entergy standard line/breaker panel with line differential, SEL 421 primary 1 and SEL 311L primary 2 on the Tezcuco to Bayou Line
- Purchase, design and install one (1) Entergy standard double breaker control panel
- Purchase, design and install two (2) Entergy standard bus differential panels with the SEL 487B relay. Designer must verify the availability of spare CT's in the high side of the customers transformers
- Install four (4) 230kV high voltage breakers
- Purchase and install one (1) 3000A line trap
- Purchase and install one (1) line tuners
- Purchase and install twelve (12) metering accuracy 230kV CCVT's to be used with the line relaying and metering, (3) Little Gypsy line, (3) Tezcuco line, (3) for each transformer node
- Purchase and install two (2) Entergy standard High Voltage PT junction boxes for each line node
- Purchase and install one (1) patch panel for fiber connections. Coordinate with telecom to get the panel ordered

New Control House Miscellaneous Equipment

- Purchase and install a 130 volts DC battery set with rack. Size batteries by referencing Entergy Standard PM0203 Rev. 00 "Lead-Acid Storage Battery Sizing Guideline".
- Purchase, and install a DC battery charger. Battery charger should be sized by referencing Entergy Standard PM0302, Rev. 00 "Battery Charger Sizing Guideline".
- Purchase and install a DC battery switching panel
- Purchase, design and install a stand-alone AC panel.
- Purchase, design and install a stand-alone DC panel.

- Purchase and install an indoor AC transfer switch
- Purchase and install GE Harris D20 RTU, LP&L design
- Purchase, design and install all communications equipment to line, breaker and meter panels for metering data
- Install SSVT for primary station service, second source may come from local feeder or customers transformer
- Install AC transfer switch
- Purchase and install outdoor telephone demarcation box
- Purchase and install indoor telephone box
- Purchase and install Teletone Gauntlet (SLSS)
- Purchase and install a SEL 2032
- Purchase and install a SEL 2407 for relay time sync.
- Coordinate with the Communications Group to provide two telephone circuits. One circuit will be a 2-wire voice grade type for the house phone. The other circuit will be a 4-wire data grade type for the RTU.
- Purchase and Install a Static Inverter (to be mounted in the RTU)
- Complete design and installation will be required for the electrical power supplies, controls, monitoring alarms, analog data and communications for the following devices, as applicable:

    - (2) Line/Breaker Panels
    - (2) Transformer meter panel
    - High Voltage Double Breaker Control Panel
    - (4) – High Voltage Breakers

Relay Settings and RTU Configuration

- Relay settings will be required for the following relays

    Schweitzer Type SEL-421 Distance relay
    Schweitzer Type SEL-311L Line Differential
    Schweitzer Type SEL-311C Distance relay
    Schweitzer Type SEL-487B Bus Differential

- A GE Harris D20 RTU will be installed and require a configuration package. The Bayou Steel Transformer metering data will be brought into the RTU via DNP protocol from the meter panel.

- Purchase and install a SEL 2407 for relay time sync.
- Purchase and Install a Static Inverter (to be mounted in the RTU)
- Complete design and installation will be required for the electrical power supplies, controls, monitoring alarms, analog data and communications for the following devices, as applicable:

    (4) – Line/Breaker Panels
    (1) – 2 Transformer meter panel

(4) – High Voltage Breakers

- Study and apply Regulatory and Entergy Standard compliance for setting revisions and setting updates.
- Perform limited classical relay impact studies on affected lines and buses from remote stations.
- Model the new Bayou Steel to Tezcuco
- Develop new relay settings and prepare setting test plans for 230 KV Bayou Steel Bus Differential Panel per Entergy Standard. The setting scheme will be SEL487B options B, C, or D
- Develop new relay settings and prepare setting test plans for 230kV Line Panel for the Tezcuco line at Bayou Steel per Entergy Standard PM1803. The setting scheme for the SEL421 and SEL311L will be Option B.
- Develop new relay settings and prepare setting test plans for 230kV Line Panel for the Bayou Steel-Little Gypsy line per Entergy Standard PM1803. The setting scheme for the SEL421 and SEL311C will be Option K.

- Develop new relay settings and prepare setting test plans for 230kV Double Breaker Control Panel at Bayou Steel per Entergy Standard. The setting scheme will be SEL351-7 all options.
- Develop new carrier frequency.
- Revise Z3 and Z2 and possibly upgrade relay firmware for all Little Gypsy and Tezcuco remote stations .
- Provide off site/ on site setting supports during construction for setting database issues, relay software and firmware compatibility.
- Perform setting logistics such as relay date base (.rdbs or mdbs), relay viewable document (.xls) , project work folders for Web posting (DOCUMENTUM), relay modeling in ASPEN®.
- Perform relay settings corrections and issue new “as built” settings based on returning “as left” settings.

Communications and SCADA

- A GE Harris D20 RTU will be installed and require a configuration package. The Nucor line metering data will be brought into the RTU via DNP protocol from the meter panel
- Purchase and install two patch panels for fiber connections. Coordinate with telecom to get these panels ordered. 19” racks will also need to be coordinated.
- Coordinate with the Communications Group to provide two telephone circuits. One circuit will be a 2-wire voice grade type for the house phone. The other circuit will be a 4-wire data grade type for the RTU

Metering

- Purchase, design and install one (1) 2 transformer meter panel. Designer should determine what telemetering information would be needed by the customer.

- Purchase, design and install three (6) free standing extended range metering (0.15sB1.8) accuracy CT's on each Bayou Steel transformer line (total 6). CT ratio will be determined by relay designer
- Purchase, design, and install two metering (2) CT junction boxes

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.12. Michoud 115 kV Substation: Replace 115KV Breaker N9803

General

- Replace OCB N9803 to the Claiborne 115kV line with a breaker with an interrupting current rating of at least 51KA.

Site

- No site package necessary. Assume 100 tons of limestone for cleanup and grading site after construction.

Foundations

- Assume existing foundation can be utilized. New breaker will be Hilti- bolted into the foundation.

- Install one (1) junction box foundation.
- Install 150’ of 2” conduit
- Install 100’ of ground grid and ground leads.

Electrical

- Remove one (1) OCB breaker (N9803)
- Install one (1) GCB 3000A, 63KA, 3 cycle breaker.
- Assume the re-use of existing cables. A junction box will be installed to terminate existing cable and new cables will be pulled to the breaker cabinet.

Relay:

- The scope of this project is to replace 115kV breaker N9083 at Michoud substation. With the proposed addition of 200MW of generation at the Ninemile substation this breakers KA rating must increase to accommodate the increase in the available fault current. The new rating for this breaker will be 63kA.
- The breakers relay control panel will not be replaced during this project.
- Assume the reuse of existing cables. A junction box will be installed to terminate existing cable and new cables will be pulled to the breaker cabinet.
- Install one (1) 115kV breaker
- Purchase, design and install a breaker control junction box. This junction box will be use to connect the control cables from the new breaker to the control panel in the control house.

Relay Settings

- Settings review due to CT ratio change in the settings.
- Settings review of the 115KV bus diff settings
- System modeling update of LM database.

Communications and SCADA

- Add new breaker alarms to RTU

Metering: N/A

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.

- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.13. Tezcuco 230 KV Substation: Install New 230 KV Line Bay

General

- Install a new 230kV line from the new Bayou Steel 230kV substation. To accomplish this, the existing Tezcuco 230kV substation will have to be expanded. Tezcuco is presently configured in a breaker and a half arrangement with four bays developed. This substation will have to be expanded by one bay to the east. This bay will have only two breakers installed. These breakers will occupy the center and south bus positions and the center breaker will tie to the north bus. Provisions will be made so that a north bus breaker can be installed in the future.

Site

- The proposed expansion of the Tezcuco Substation site will be approximately 145’ by 415’. It will be constructed on an existing sugar cane field that will be to the east of the existing substation.

- A topographic and boundary survey will be needed in order to properly design the site. However, this information will not be completed and processed prior to completing the scope document. Therefore, certain assumptions will be made in order to complete the scope and estimate. Two concrete monuments will need to be set in order to provide control for design and construction.
- No soil borings or soil resistivity studies will be needed. All foundations being used have been utilized in the existing station.

- All appropriate environmental assessments, permits and licenses will need to be obtained prior to construction. It is assumed that the proposed substation location is not wetlands.

- The site will be approximately 1.38 acres. A SWPPP will be needed. This plan will be contracted out to a qualified contractor. The project manager shall ensure this work is completed prior to the start of the bid process. This will allow the contractors bidding on the work to understand and plan for our expectations.

- The elevation of the site is unknown at this time. It will be assumed that the site will need to be stripped 12" below existing grade and the site will need to be elevated about 2 feet above exiting grade to match the existing substation grade.

- Due to the lack of survey information the following quantities are based on assumptions. The drainage in the station will be subsurface drainage and will tie into the existing subsurface drainage. We will elevate the site approximately 2 feet above the existing grade to bring the site to the proper grade. It is assumed that light grubbing will be needed and the vegetation will need to be stripped from the top surface. In order to provide enough area to taper the final grade of substation back to the existing grade, additional land will be needed. This has been accounted for in the area stated above. Also, we will have a large amount of spoil to remove during the site and foundation construction. It is assumed that spoil removed during site and foundation installation can not be used as structural fill and spread across the site. Therefore, this spoil will need to be brought to a landfill and disposed of properly. A phase 2 environmental soil testing will need to be performed on the site to determine proper disposal of the spoil. This sampling will need to take place before construction begins to ensure that the proposed site is not contaminated and the contractor performing the work will know what will be expected in order to dispose of the spoil. Until soil testing has been completed an accurate estimate for disposing of the spoil will not be feasible.

- The following is a list of the site requirements:
    - 2 EA Topographic and boundary survey
    - 1 EA Environmental impact study, permits and licenses
    - 1 EA SWPPP
    - 1 EA Soil Testing (for phase 2 environmental testing)
    - 3120 CYD Stripping 12" of top soil
    - 1.38 ACRE Light grubbing to consist of cutting sugar cane and the removal of sugarcane debris
    - 9360 CYD Structural fill (Raise site 4 feet above existing elevation)
    - 6 EA 3'x3' Catch Basins
    - 400 FT 24" diameter concrete culverts
    - ACRE Soil Sterilization
    - 685 FT Substation access road
    - 3120 TON Limestone surface
    - 685 FT 7' fence with 1' of barb wire with up to 2 isolation panels
    - 430 FT Removal of 7' fence with 1' barb wire
    - 3500 CYD Hauling of Spoil

- 4800 TON Disposing of Spoil

Foundations

- The foundations for this substation will be pile-supported with concrete caps. The estimated number and type of piles are 104 (each) 40' "Class B" wood piles.
    - Install three (3) 230 kV Gas Circuit Breakers Foundations
    - Install six (6) 230 kV Low Switch Support Foundations
    - Install two (2) 230 kV A-Frame Dead End Foundations
    - Install six (6) 230 kV Single Phase Low Bus Support Foundations
    - Install twelve (12) 230 kV Single Phase High Bus Support Foundations
    - Install three (3) 230 kV CCVT Support Foundations
    - Install three (3) 230 kV Line Arrester Support Foundations
    - Install 315 feet of Poured-In-Place Cable Trough
    - Install three (3) Yard Light Foundations
    - Install 600 feet of Conduit
    - Install 5,100 feet of grounding material per Entergy standards

Electrical

- Expand the substation one bay to the east. This will require the high south and north buses, constructed of 6" Sch. 40 tubing, to be extended by 80'. Each high bus will be supported by six additional single phase high bus supports and three single phase low bus supports at the termination of the new bay.
- The new bay will be configured like the other bays, except that only two breakers will be installed initially. These 3,000 Amp, 63KA breakers will be installed in the center and south bus positions. Provisions will be made for the future north bus breaker. Switch structures around the future breaker position will be installed as bus supports. 4" Sch. 80 tubing will span across this future position. Two A-Frame dead-end structures will be installed. The Bayou Steel 230kV line will terminate on the dead-end structure closest to the south bus. Three CCVT's and three lightning arresters will be mounted on individual single phase pedestals under the south dead-end A-Frame structure. Two 3,000 Amp vertical disconnect switches will be installed around each breaker. A ground switch will be installed on the disconnect switch between the south dead-end structure and the center breaker.

- The installation of the new bay will require the following:
    - Two (2) 230 kV 3,000 A gas circuit breakers
    - Four (4) 230 kV 3,000 A vertical break switches, one (1) with a ground switch
    - Six (6) low switch structures, two w/ insulator supports (no switches, future use)
    - Two (2) A-frame dead end towers
    - Twelve (12) high lally bus support columns
    - Six (6) low lally bus support columns
    - Three (3) 230 kV CCVTs beneath the line terminal
    - Three (3) CCVT pedestals
    - Three (3) 192 kV, 152 kV MCOV station class arresters beneath the line terminal
    - Three (3) arrester pedestals
    - One lot of 6" schedule 40 aluminum tubing with damper cable
    - One lot of 4" schedule 80 aluminum tubing with damper cable
    - Seventy-two (72) 230 kV porcelain post insulators
    - One lot of (2) 1780 kcmil Chukar ACSR for flexible connectors to breakers.
    - One lot of (1) 954 kcmil Magnolia AAC for flexible connectors to CVTs and arresters
    - One lot of grounding material per Entergy standards
    - One (1) junction box for fiber termination
    - All structures and equipment will be grounded per Entergy specifications.
    - All above-grade conduit will be flexible 2" PVC to junction and control boxes, except to CVTs and CTs, which will be 1-1/2" flexible PVC.
    - Three (3) 400 W free standing single yard lights around the perimeter of the yard.

Relay

- With the proposed addition of 200MW of generation at Ninemile substation the Belle Point-Little Gypsy 230kV transmission line overloads for the loss of the Waterford-Tezcuco-Frisco 230kV transmission line. Also, the Waterford-Tezcuco 230kV transmission line overloads for the loss of the Belle Point-Little Gypsy 230kV transmission line. To alleviate these constraints the scope of this project is to construct approximately 9 miles of 230kV line rated at 642MVA (741A) from Bayou Steel to Tezcuco substations. This new line will be constructed with fiber optics (OPTGW) in the shield wire.
- The new line bay at Tezcuco substation will be a breaker and a half configuration with only two breakers installed. The breakers will be connected to the south bus with the center breaker connected to the north bus. The south

bus breaker will be added to the south bus differential scheme and the center breaker will be added to the north bus differential scheme. The center breaker will remain part of the north bus differential until a north bus breaker is added in the future.

- The South and North bus differential schemes have spare CT and control points available for the new breakers. The control house has adequate space to install the new panels. The RTU has adequate points for the new alarms. The AC and DC panels have adequate breakers for the new installation.

- Purchase, design and install one (1) line/breaker control panel with line differential and fiber optic communications. Entergy standard SEL 421 primary 1 and SEL 311L primary 2.
- Purchase, design and install one (1) single breaker control panel. Entergy standard SEL 351 relay breaker control panel
- Install two (2) 230kV, 3000A breakers
- Purchase and install three (3) 230kV CCVT's on the line
- Purchase and install an outdoor high voltage potential junction box
- Add new breakers to their associated bus differential scheme

Relay Settings

- SEL 421
- SEL 311C
- SEL 311L
- SEL 351S Breaker Control Panel
- SEL 487B North Bus and South Bus
- Develop new relay settings and prepare setting test plans for 230kV Line Panel for the Bayou Steel line at Tezcuco per Entergy Standard PM1803. The setting scheme for the SEL421 and SEL311L will be Option B.
- Revise Z3 and Z2 and possibly upgrade relay firmware for all Tezcuco remote stations.
- Possible revisions for all existing settings at Tezcuco due to the addition of a transmission line to the station
- Provide off site/ on site setting supports during construction for setting database issues, relay software and firmware compatibility.
- Perform setting logistics such as relay date base (.rdbs or mdbs), relay viewable document (.xls) , project work folders for Web posting (DOCUMENTUM), relay modeling in ASPEN®.
- Perform relay settings corrections and issue new "as built" settings based on returning "as left" settings.

Communications and SCADA

- Install patch panel for new fiber optic cable
- Purchase and install fiber optic jumpers from SEL 311L to new patch panel
- Purchase and install necessary communication cables to connect new relays to SEL 2032 communication processors
- RTU and Host add alarms

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.14. Little Gypsy 230kV Substation: Install Line Trap

General

- Install a line trap, tuner, and CCVT for the Bayou Steel 230kV line.

Site

- No site package necessary. Assume 50 tons of limestone for cleanup and grading site after construction.

Foundations

- Foundation, grounding, and below grade conduit already in place from previous job.

Electrical

- Install one (1) 230 kV trap, suspended in “A” frame with appropriate jumpers.
- Install one (1) CCVT on the A phase of the Bayou Steel 230kV line under the dead-end structure.
- Install one (1) junction box on the CCVT pedestal.

- Install flexible conduit between the Line tuner junction box and CCVT junction box and from CCVT junction box to conduit stub-ups.
- All structures and equipment will be grounded per Entergy specifications.
- CCVT tower and subsurface conduit already in place from previous job.

Relay

- The addition of 230kV breakers at Bayou Steel substation will require modifications on the Bayou Steel line panel at Little Gypsy. Presently the Bayou Steel Line panel at Little Gypsy has impedance relaying only, no relay communication. The scope of this project is to install Entergy standard unblocking carrier set to match the carrier set installed on the new Little Gypsy line panel at Bayou Steel substation.
- The existing primary and backup relays on the Bayou Steel line panel at Little Gypsy will be adequate for this installation.
- Purchase and Install an Entergy standard Unblocking carrier set, mount carrier set in the Bayou Steel line panel.
- Purchase and install carrier accessories into the primary relay scheme (85CO, 85PB, etc.)
- Purchase and install one (1) 230kV CCVT
- Purchase and install one (1) CCVT junction box
- Purchase and install 3000A line trap
- Purchase and install a line tuner

Relay Settings

- Review existing relay settings
- Get new carrier frequency from relay setting group
- Develop new relay settings and prepare setting test plans for 230kV Line Panel for the Bayou Steel line at Little Gypsy per Entergy Standard PM1803. The setting scheme used will include the SEL421 and SEL311C relays using a unblocking with powerline carrier scheme
- Revise Z3 and Z2 and possibly upgrade relay firmware for all Little Gypsy remote stations.
- Possible revisions for all existing settings at Little Gypsy due to the addition of a transmission line to the station.
- Provide off site/ on site setting supports during construction for setting database issues, relay software and firmware compatibility.
- Perform setting logistics such as relay date base (.rdbs or mdbs), relay viewable document (.xls) , project work folders for Web posting (DOCUMENTUM), relay modeling in ASPEN®.
- Perform relay settings corrections and issue new “as built” settings based on returning “as left” settings.

Communications and SCADA

- Add new carrier alarms to RTU

Metering: N/A

Construction

- All substation construction will be offered to the Entergy Asset Management Organization to complete. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- All transmission line construction will be offered to the Entergy Asset Management Organization to complete with contract resources. In the event that Entergy Asset Management refuses these opportunities, Transmission Construction Management will utilize the competitive bidding process to award contracts for completion. It is imperative to provide the time to complete this process. Sole Source contracting strategy should not be considered as a viable solution. If it is recommended, approval must be obtained from Supply Chain Vice President.
- Entergy ROW/Vegetation department will coordinate and write contracts for all ROW clearing and storm water management installations/maintenance items. Project Manager should work closely with the ROW department to establish a monitoring contract with a notable environmental firm to complete the weekly inspections as per required by state and federal environmental laws.
- Asset Management will be requested to complete all switching required for this project.

4.15. Ninemile Switchyard: Modifications for New Generator Interconnection

General

- The proposed new generating units 6A, 6B, and 6C will be constructed southeast of the existing 115/230kV switchyard. The existing generating Unit #1 and Unit #2 presently terminated in the 115kV yard will be removed. New Generator Unit #6A and Unit #6B will be terminated in the 115kV yard and Generator Unit #6C will be terminated in the 230kV yard.
- The scope and estimates provided in this section of the Facility Study include modifications required in the existing 115/230 kV switchyard up to the generator interconnection attachment point on the switchyard dead-end structure. The customer will be responsible for all transmission lines and equipment additions/modifications required outside of the switchyard and up to the attachment at the existing 115/230 kV switchyard dead end structures.
- It is assumed that disconnect switches #S6321 and #S6322 will be replaced with 2000 Amp switches. If disconnect switches are installed in the generation facility on the transmission side of the 115kV breakers, switches #S6321 and #S6322 could be removed.
- Refer to Ninemile L0080S05 and L0080S06 one-lines

Site

- No site packages will be needed. Limited site work will be needed. It is estimated that 500 tons of limestone will be needed in order to back fill trenches and clean up and grade site after construction is completed.

Foundations

- New conduits will need to be run to four of the existing breakers in the 115 kV yard. A transition box will need to be installed at each breaker foundation. A pull box will need to be installed in the yard to make pulling new cables easier. Finally, a new entrance into the 115 kV Control House will be needed. In order to do this, a transition box will need to be installed at the control house. All transition boxes and pull boxes will be poured in place. Each breaker foundation will be saw cut in order to bring the new cables into the control boxes.
- Install (4) Four Transition box at breaker in the 115 kV Yard
- Install (1) One Pull box in the 115 kV Yard
- Install (1) One Transition box at the 115 kV Control House
- Saw cut (4) Four existing breaker foundations
- 2,600 feet 2" PVC Sch. 40 conduit between breakers # S6320, #S6325, #S6312, #S6342 and the east side of the 115kV control house.
- Install 25 feet 2" PVC conduit for fiber from DE structure to transition box (2 115kV DE structures)
- Install 25 feet 2" PVC conduit from northeast leg of DE structure into side of trough (1 230kV DE structure)

Electrical

- Existing Ninemile Generator Unit #2 will be disconnected from the dead-end A-Frame structure between breakers #S6320 and #S6325. A new line termination from Gen Unit 6A will be terminated in this position. The existing termination on this DE structure is from the north. The new termination will be from the south.
- Existing Ninemile Generator Unit #1 will be disconnected from the dead-end A-Frame structure between breakers #S6312 and #S6342. A new line termination from Gen Unit 6B will be terminated in this position. This termination is presently from the north and will remain from the north.
- Gen #6C will be terminated in vacant position between breakers #S2048 and #S2045.
- In the new Gen. #6A Bay, the following will be removed:
    - Three (3) cap and pin suspension insulators
    - Three (3) cap and pin post insulators (mounted facing south)
    - 75' 1 ¼" tubing bus risers
    - Switch #S6322 with cap & pin insulators
- In the new Gen. #6A Bay, the following will installed:
    - Three (3) 115kV suspension insulators

  - Three (3) 115kV post insulators (mount facing north)
  - 100’ 1,272 ACSR risers, jumpers, and connections
  - One (1) 115kV 2,000A switch (#S6322)
  - Nine (9) 115kV post insulators (for Switch #S6322)
  - Three (3) 115kV line arresters mounted on beam inside of DE structure. (Use arrester beam mounted in Little Gypsy 115kV DE structure for design guidance.)
  - Fiber coil rack mounted to DE structure with 2” conduit to stub up.
- In the new Gen. #6B Bay, the following will be removed:
  - Three (3) cap and pin suspension insulators
  - Three (3) cap and pin post insulators (mounted facing south)
  - 75’ 1 ¼” tubing bus risers
  - Switch #S6321 with cap & pin insulators
- In the new Gen. #6B Bay, the following will be installed:
  - Three (3) 115kV suspension insulators
  - Three (3) 115kV post insulators (mount facing south)
  - 100’ 1,272 ACSR risers, jumpers, and connections
  - One (1) 115kV 2,000A switch (#S6321)
  - Nine (9) 115kV post insulators (for Switch #S6321)
  - Three (3) 115kV line arresters mounted on beam inside of DE structure. (Use arrester beam mounted in Little Gypsy 115kV DE structure for design guidance.)
  - Fiber coil rack mounted to DE structure with 2” conduit to stub up.
- In the new Gen. #6C Bay, the following will be removed:
  - Handle to Ground Switch #S2412
- In the new Gen. #6C Bay, the following will be installed:
  - One (1) 230kV suspension insulator (middle phase has been removed, outside phases are in place)
  - 35’ 1,272 ACSR (center phase riser) and connections.
  - Fiber coil rack mounted to DE structure with 2” flexible conduit to stub up.
- In the existing 115 kV switchyard control house, install an external cable tray, mounted vertically and enclosed in a sheet metal raceway, from the transition box into the side wall of the control house.

Relay, General Scope

- Fossil proposes to install three new generators 6A, 6B and 6C at their Ninemile 115/230kV plant. Generator 6A will connect in generator #2 position between breakers S6320 and S6325. Generator 6B will connect in generator #1 position between breakers S6312 and S6342. The third generator 6C will be

installed and connected to the 230kV yard connecting between breakers S2045 and S2048 which is the old Southport #2 line bay.

- Presently generators #1 and #2 step-up transformers connect directly into the breakers in the Ninemile 115kV switchyard. These breakers are the disconnect devices for the existing generators and have controls and relay protection located in the Ninemile control room. All interconnections between the Ninemile control room and these breakers must be removed for the new generators installation.
- The breaker failure controls for these breakers are located in the Ninemile 115kV switchyard control house. Controls for breakers S6320 and S6325 are located on a triple breaker control panel and will remain in service for the new generator installation. Controls for breaker S6342 is located on the Gretna line panel. These controls will remain in service for the new installation. Controls for breaker S6312 is located in the Ninemile control room with a breaker failure panel located in the 115kV switchyard control house. This breaker failure panel will be removed for the new installation. S6312 controls will be located on a new line panel. Generator 6C will connect into the old Southport #2 bay between breakers S2045 and S2048. The existing stub bus relay protection will be removed and be replaced with new line relaying.
- The new generator yard will be constructed southeast of the existing 115/230kV switchyard. The new generators will have breakers installed after each step-up transformer which will require line relaying to be installed between the switchyard breakers and the new generator breakers. Since the lines to the new generators are very short, fiber optics will be installed on these lines for relay communications. The line protection will be the Entergy standard SEL 311L line differential and SEL 421 relay protection panel. The relay panels installed at the plant mush match the relay panel installed at the Ninemile 115kV and 230kV substations.
- It is assumed the 115 and 230kV switchyards control houses have adequate room to install the new panels.
- It is assumed the AC and DC panels have space to add breakers if needed.
- It is assumed the RTU has available points for the new equipment.

Relay Work

- Remove all wiring between the generator breakers and panels in the 115kV switchyard and the Ninemile control room.
- Remove Breaker S6312 breaker failure panel
- Purchase, design and install one (1) line/breaker control panels with line differential relaying for Generator 6B. Entergy standard SEL 421 (P1), SEL 311L (P2). Breaker controls will be for breaker S6312
- Purchase, design and install two (2) line panels with line differential relaying for Generator 6A and 6C. Entergy standard SEL 421 (P1), SEL 311L (P2)
- New control cables will be pulled between the new panels and existing breakers
- Complete design and installation will be required for the electrical power supplies, controls, monitoring alarms, analog data and communications for the following devices, as applicable:

- Line/Breaker control panel
- Line panels

Relay Settings

- Relay settings will be required for the following relays for the transformer:
  - Schweitzer Type SEL-421 Distance and Bkr Control
  - Schweitzer Type SEL-311L Line Differential
- Study and apply Regulatory and Entergy Standard compliance for new line relay settings, revisions and updates.
- Perform limited classical relay impact studies on affected lines and buses from remote stations.
- Develop new relay settings and prepare setting test plans for 115kV Generator A Line Panel per Entergy Standard PM1803. The setting scheme will be SEL421 Option C-2 /SEL311L option C2.
- Develop new relay settings and prepare setting test plans for 115kV Generator B Line and Single Breaker Control Panel per Entergy Standard PM1803. The setting scheme will be SEL421 Option B2-2 /SEL311L option B2-2.
- Develop new relay settings and prepare setting test plans for 230kV Generator C Line Panel per Entergy Standard P18032. The setting scheme will be SEL421 option C-2 / SEL311C option C2.
- Review/Revise 115 kV Bus Differential relay settings (Primary and Backup PVD relays)
- Review/Revise 230 Bus Differential relay settings (Primary and Backup PVD relays).
- Review/Revise remote station zone2 and zone 3 settings for 5 stations that feed the 115 kV bus (Westwego, Gretna, Barataria, Luling and American Cyanide)
- Review/Revise remote station zone 2 and zone settings for 6 stations that feed the 230 kV bus (Harahan, Estelle, Waterford, Derbigny, Market Street and Southport #2)
- Provide off site/ on site setting supports during construction for setting database issues, relay software and firmware compatibility.
- Perform setting logistics such as relay date base (.rdbs or mdbs), relay viewable document (.xls) , project work folders for Web posting (DOCUMENTUM), relay modeling in ASPEN®.

Communications and SCADA

- Add new alarms to RTU and modify existing alarms

Metering

- Generator metering will be installed by fossil

Construction

- The following comments include assumptions and requirements for the implementation of the scope identified above:

- The customer and Ninemile Point Plant will be responsible for all activities required to remove & determinate existing cables between the switchyard and the existing control room as required.
- The transmission line poles to be installed to the east of the 115 kV switchyard for interconnection of generator #6A and #6B will prohibit future expansion of the 115 kV yard for an additional line may. It is recommended that this arrangement and risk be reviewed before this layout is finalized.
- It is assumed that Ninemile Generating Unit #1 and #2 will be out of service for the duration of construction activities in the 115 kV switchyard associated with this facility study. The cost estimates and work scope provided are based on this assumption.
- While performing the transmission line scope of work required for interconnection of Generators #6A, 6B, and 6C, outages will be required on the following lines simultaneously for up to 3 weeks duration:
    - Ninemile Unit #4/5 Start-up line
    - Ninemile Unit 4
    - Ninemile Unit 5
    - Ninemile Switchyard 230 kV and 115 kV North Bus
- Installation of transmission line poles & foundations will result in spoil dirt. The customer must designate a place for the spoils to be deposited.
- Any new pole installed in the existing 115/230 kV switchyard must be bonded to the existing grounding grid.
- The customer must identify and provide a laydown area for transmission line & substation materials. It is assumed some ground improvements will be required in this laydown area prior to used.

.

5. CONSTRUCTION MANAGEMENT PLAN

5.1. Construction Sequencing and Special Issues

- Once project approval has been completed, a more detailed construction schedule will be completed. Please see attached duration schedule for our current planned course of action.
- Construction will depict multiple access areas along the proposed line route. Construction will need to work closely with ROW/Vegetation group to ensure proper environmental regulations are being met. This may require but is not limited to silt fence installations, construction entrance installation, and any other BMP (Best Management Practices) to ensure compliance with any environmental requirements.
- All interfaces between Entergy and separate utilities will need to be closely coordinated. Entergy has requested that any time there is a tie point between Entergy and outside utility, that Entergy will install the first structure outside of the substation to provide a smooth transition when it comes time to tie in the newly constructed assets.

- ROW acquisition will be imperative to complete the installation of the transmission line. Durations provided in the estimate must be granted to ensure project success.
- No temporary re-routes for distribution and/or transmission facilities have been estimated as a part of this project.
- No specialized equipment shall be required at this point to complete the construction. Lay-down yards may be required at several locations along the proposed line route. These lay-down yards will be secured 100% of the time while construction materials and equipment are present.
- The current line route dictates installing the transmission line over energized distribution and transmission facilities. All possible alternatives should be considered before proceeding in this direction. It should also be known that if no other alternative can be established to mitigate this hazard, Entergy safety shall be contacted to discuss these methods in order to get proper approval to install this conductor over the energized crossing. It has been requested that if no other alternative is present, that Transmission line design incorporate the installation of dead-end structures at each side of the hot line crossing.

5.2. Outage Plan

- Planning should evaluate each outage requested below and specify any constraints that may be placed on each AORS request, such as load constraints.

Line or Bus	Device #s	Reason	Est. Duration
Transmission Lines			
Averico Line 645 Radial		Line Crossing	3 days
Generating Units/Equipment			
Ninemile Unit 4		Proposed generator interconnection	3 weeks
Ninemile Unit 5		Proposed generator interconnection	3 weeks
Ninemile Unit 4/5 115 kV Start-up line		Proposed generator interconnection	3 weeks
Substation Buses			
Meaux 138kV Bus 1		Reconductor Bus	8 days
Richard 500kV Bus		Cut in New Bay	14 days
Moril 138kV Bus with Auto #2		Install Bus tie breaker, new line bay, and new interrupter on Autotransformer #2	4 weeks
Ninemile 115 kV & 230 kV North Bus		Proposed generator interconnection	3 weeks

5.3. Lay-Down and Staging Areas

- Substation and relay material will be staged either in the substation where the construction will commence or in Hammond at the storeroom.
- All large transmission line materials will need to be staged at the distinct lay-down yards as requested by construction engineer. All other miscellaneous material will be stored at the Hammond Storeroom.
- Entergy construction and ROW agent will work to determine best locations for project lay-down yards. All attempts will be made to use areas adjacent to substations where servitude may be present, but temporary servitudes will more than likely be needed for lay-down yards. Due to the high traffic in and out of lay-down yards during construction, it is not advisable to utilize substations.

6. COST

The ICT has reviewed and determined whether each required upgrade will be considered a Base Plan Upgrade or a Supplemental Upgrade. For more information on cost responsibility for Base Plan and Supplemental Upgrades, see Attachment T to Entergy's OATT.

The costs shown in the table include overheads and AFUDC, but do not include tax gross up. Entergy incurs a tax liability proportional to the amount of customer contributions. In addition to proposed project costs, the customer may be charged a "Tax gross-up" (TGU) at applicable rates. Rates are subject to change. TGU is not included in any of the estimates.

Projected Costs

	TOTAL w/ overheads	Base Case	Supplemental	ERIS	NRIS
Bayou Steel – Tezcuco 230 kV Line	$24,991,000		$24,991,000		X
Webre-Wells 230 kV Line	$78,814,000		$78,814,000		X
Meaux-Sellers Road 230 kV Line	$22,073,000	$22,073,000			X
Sellers Road-Labbe 230 KV Line	$35,081,000	$35,081,000			X
Richard: 500 KV Terminal	$2,316,000	$2,316,000			X
Meaux: 230/138 kV Auto	$12,851,000	$12,851,000			X
Moril: 138 kV Terminal	$1,483,000	$1,483,000			X
Wells: 500 KV Terminal	$1,136,000	$1,136,000			X
Webre: 500/230 kV Auto	$30,509,000		$30,509,000		X
Bayou Steel: 230 KV	$12,109,000		$12,109,000		X
Michoud: 115 kV Breaker	$351,000		$351,000	X	X
Tezcuco: 230 kV Terminal	$3,754,000		$3,754,000		X
Little Gypsy: Line Trap	$185,000		$185,000		X
Ninemile: Interconnection	$988,000		$988,000	X	X
SUBTOTAL		**$74,940,000**	**$151,701,000**		

Cleco and Lafayette Utilities scope of work as described in Section 1.1	TOTAL w/ overheads	Base Case	Supplemental	Comments
Richard 230kV Substation	By others			Section 1.1
Sellers 230kV Substation	By others			Section 1.1
Segura 230/138 kV Substation	By others			Section 1.1
Richard to Sellers 230 kV Line	By others			Section 1.1
Sellers to Segura 230 kV Line	By others			Section 1.1
Segura to Moril 230 kV Line	By others			Section 1.1
Wells: 500/230kV Autotransformer and 230kV Line Terminal	By others			Section 1.1
Labbe: Three new 230kV Line Terminals	By others			Section 1.1
Wells to Labbe 230 kV Line	By others			Section 1.1
Bonin: 230 kV Line Terminal	By others			Section 1.1
Bonin to Labbe 230 kV Line	By others			Section 1.1

7. SCHEDULE

A detailed schedule will be prepared subsequent to customer approval to proceed with the project. Based on the Task duration schedules listed below, the overall project in-service date is projected to be 12/1/2012. The following are rough durations:

Task Name	Proposed Date	Notes
Receive Funding Approval	5/1/2009	
Order Autotransformers	5/2009	
Scoping & Definition	11/2009	
Design & Procurement	11/2010	*exception – autotransformer procurement 82 weeks duration
ROW Procurement	9/2010	Duration 16 months
Bayou Steel –Tezcuco Construction Complete	11/2011	Construction duration 43 weeks
Webre-Wells Construction Complete	12/2012	Construction duration 159 weeks
Meaux-Sellers Road Construction Complete	5/2011	
Sellers Road-Labbe Construction Complete	5/2012	
Richard Substation Construction Complete	2/2011	

Meaux Substation Construction Complete	5/2011	
Moril Substation Construction Complete	12/2010	
Wells Substation Construction Complete	4/2012	
Webre Substation Construction Complete	12/2012	
Bayou Steel Substation Construction Complete	11/2011	
Michoud Substation Construction Complete	2/2011	
Tezcuco Substation Construction Complete	11/2011	
Little Gypsy Substation Construction Complete	2/2011	
Ninemile Substation Construction Complete	12/2012	

Notes to Duration Schedules:

- All construction work requiring outages will be performed during acceptable periods of system load flow, which most often is the off-peak load season. Line outages will be discussed with the SOC and TOC and the assumption is made that line outages will be executed as planned. However, last minute denial of outages by the SOC/TOC along with resulting schedule delay is possible.
- Substation construction will be coordinated with the transmission line outages when possible.
- Construction resources are available when required.
- Transmission Line and Substation projects will begin subsequent to Definition phase Project Execution Plan.
- This schedule does not account for adverse weather conditions.
- Schedule durations are high level estimates at this time. A detailed schedule will be prepared upon project approval.

8. RISK ASSESSMENT

Identify risk events that may impact cost and/or schedule during execution of the project.

Risk	Comment	Impact
Underground site issues (Pipelines, wells, containments)	Unknown underground factors will add mitigation costs and may impact schedule	***
Substation Site will require substantial site work	Site may be in flood plain, wetlands, Soil Contamination	***
Material transportation could affect cost/schedule	Large transformers(other equipment) may require special transport to substation site	**
Material costs steel & Equipment	Rising steel, copper, fuel and other market conditions could greatly affect estimated cost.	****
Lay-down areas	Cost to be determined during detailed scoping.	*
Storm-water plan implementation	Best guess on SWPPP creation, implementation and monitoring can vary greatly dependant on outcome of environmental study.	**
Weather & Equipment Lead Times (Transformer, Poles)	Unexpected delays on material lead times, unusually inclement weather will impact schedule but might impact AFUDC costs as well.	**
Wetland mitigation	Undetermined until environmental analysis is complete.	***
ROW obtainment – Acadiana Load Project	The proposed schedule for the Acadiana Load Project assumes no expropriation will be required	****
T-Line Structures Count can change	Scope based on preliminary structure count.	***
Outages may not be available	Preliminary schedule only considers general outage constraints. Specific project schedule may be delayed by days, weeks or months dependant on system conditions. Delays of months = increased project costs.	**
Scope based on design assumptions which may change	Varied impact on cost and schedule.	***
T-Line ROW may be difficult to obtain	Estimate based on assumed route. Schedule assumes ROW attainable within assumed route.	****

*-low impact to cost, ** - moderate impact to cost, ***- high impact to cost, **** - very high impact to cost.

9. CONFIRMED RESERVATIONS

The following modifications were made to the base cases to reflect the latest information available:

- Non-Firm IPPs within the local region of the study generator were turned off and other non-firm IPPs outside the local area were increased to make up the difference.
- Confirmed firm transmission reservations were modeled for the year 2009 - 2015.
- Approved transmission reliability upgrades for 2008 – 2010 were included in the base case. These upgrades can be found at Entergy's OASIS web page, http://www.oatioasis.com/EES/index.html, under the 2008 – 2010 Entergy construction plan.

PID	Substation	MW	In Service Date
PID 211	Lewis Creek	570	6/1/2011
PID 216	Wilton 230kV	251	1/1/2010
PID 221	Wolf Creek	875	In Service

Prior transmission service requests that were included in this study:

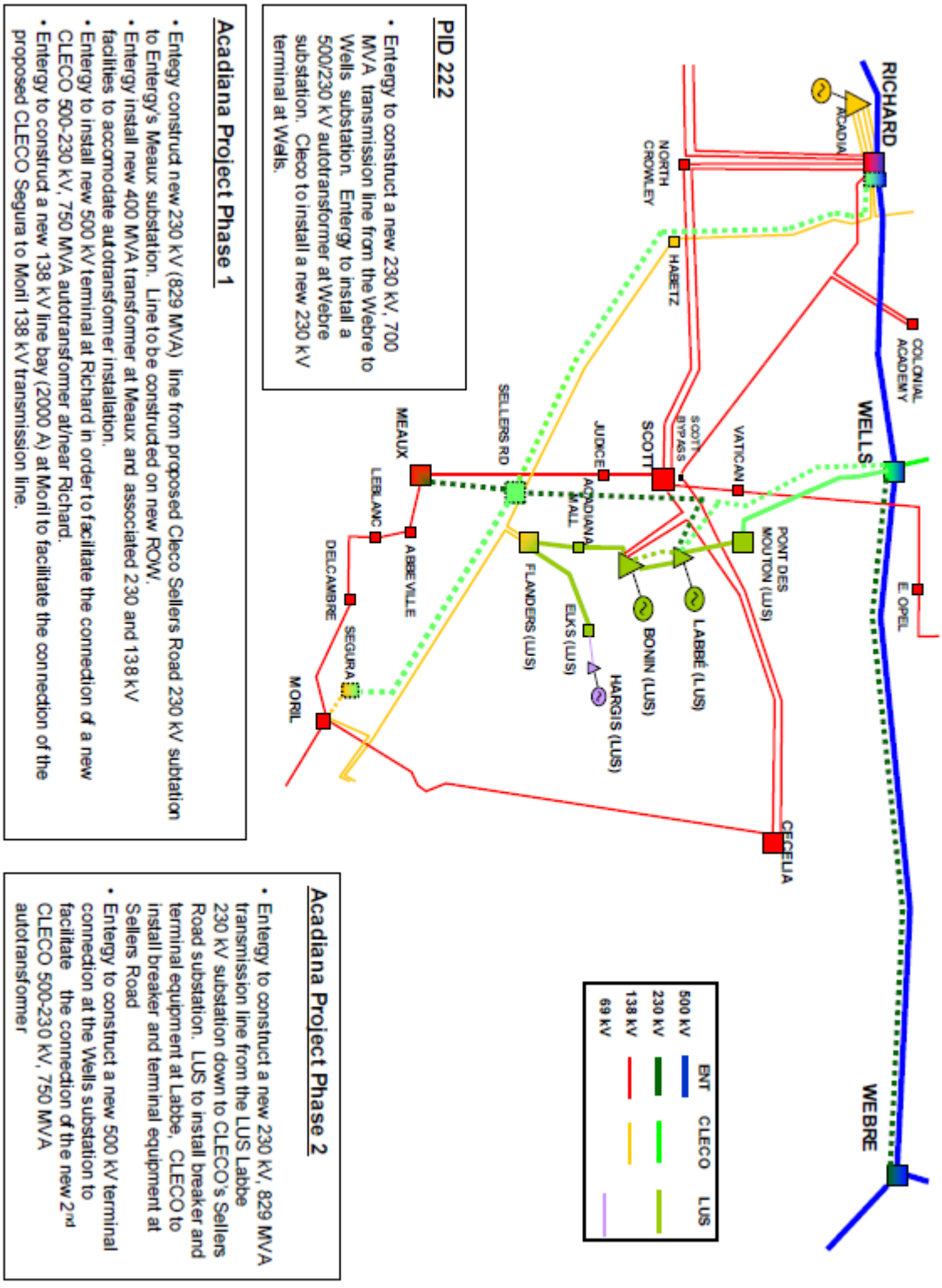
OASIS #	PSE	MW	Begin	End
1460900	Louisiana Energy & Power Authority	116	1/1/2009	1/1/2030
1478781	Entergy Services, Inc. (EMO)	804	1/1/2008	1/1/2058
1481059	Constellation Energy Group	60	2/1/2011	2/1/2030
1481111	City of Conway	50	2/1/2011	2/1/2046
1481119	Constellation Energy Group	30	2/1/2011	2/1/2030
1481235	Louisiana Energy & Power Authority	50	2/1/2011	2/1/2016
1481438	NRG Power Marketing	20	2/1/2011	2/1/2021
1483241	NRG Power Marketing	103	1/1/2010	1/1/2020
1483243	NRG Power Marketing	206	1/1/2010	1/1/2020
1483244	NRG Power Marketing	309	1/1/2010	1/1/2020
1520043	Municipal Energy Agency of Miss	20	1/1/2011	1/1/2026
1552148	Entergy Services (EMO)	1	1/1/2009	1/1/2014
1555717	East Texas Electric Coop	1	1/1/2010	1/1/2015
1555718	Entergy Services (EMO)	158	1/1/2010	1/1/2015
1557602	East Texas Electric Coop	1	1/1/2009	1/1/2017

10. ATTACHMENTS

A. Table of Acronyms

ACSR	**Aluminum Conductor Steel Reinforced**
ACSS	**Aluminum Conductor Steel Supported**
ADEQ	**Arkansas Department of Environmental Quality**
AFUDC	**Allowance for Funds Used During Construction**
ATC	**Available Transfer Capability**
EES	**Entergy Control Area**
EHV	**Extra-High Voltage**
ICT	**Independent Coordinator of Transmission**
kV	**Kilo-Volt**
MCM	**(M) Thousand Circular Mils**
MVA	**Mega-Volt Amp**
MW	**Mega-Watt**
NPDES	**National Pollution Discharge Elimination System**
NOI	**Notice of Intent**
OASIS	**Online Access and Same-time Information System**
OATT	**Open Access Transmission Tariff**
OG&E	**Oklahoma Gas & Electric**
POD	**Point of Delivery**
POR	**Point of Receipt**
SES	**Steam Electric Station**
SOC	**System Operations Center**
SHPO	**Arkansas State Historic Preservation Office**
SHV	**Super High Voltage**
SW	**Switch Station**
SWEPCO	**Southwest Electric Power Company**
TOC	**Transmission Operations Center**
WMUC	**City of West Memphis Control Area**

B. Scope Summary Diagram / Area Map



PID 222

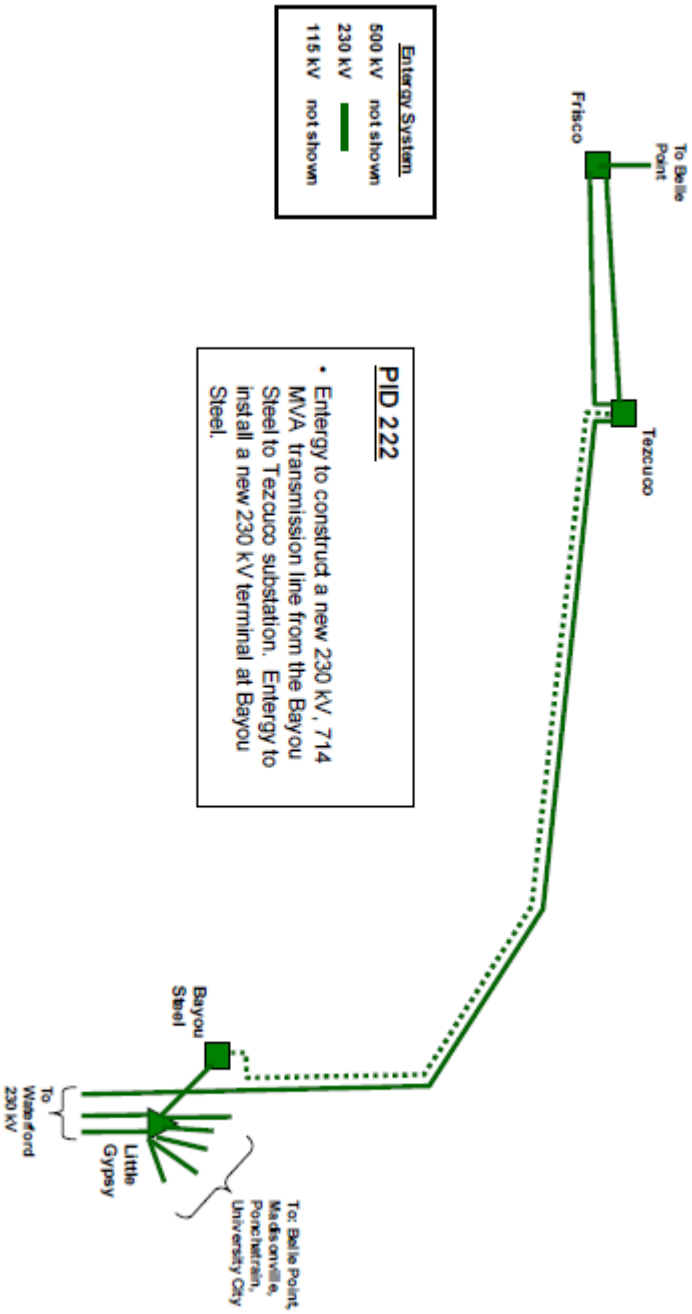
- Entergy to construct a new 230 kV, 700 MVA transmission line from the Webre to Wells substation. Entergy to install a 500/230 kV autotransformer at Webre substation. Cleco to install a new 230 kV terminal at Wells.

Acadiana Project Phase 1

- Entergy construct new 230 kV (829 MVA) line from proposed Cleco Sellers Road 230 kV substation to Entergy's Meaux substation. Line to be constructed on new ROW.
- Entergy install new 400 MVA transformer at Meaux and associated 230 and 138 kV facilities to accomodate autotransformer installation.
- Entergy to install new 500 kV terminal at Richard in order to facilitate the connection of a new CLECO 500-230 kV, 750 MVA autotransformer at/near Richard.
- Entergy to construct a new 138 kV line bay (2000 A) at Moril to facilitate the connection of the proposed CLECO Segura to Moril 138 kV transmission line.

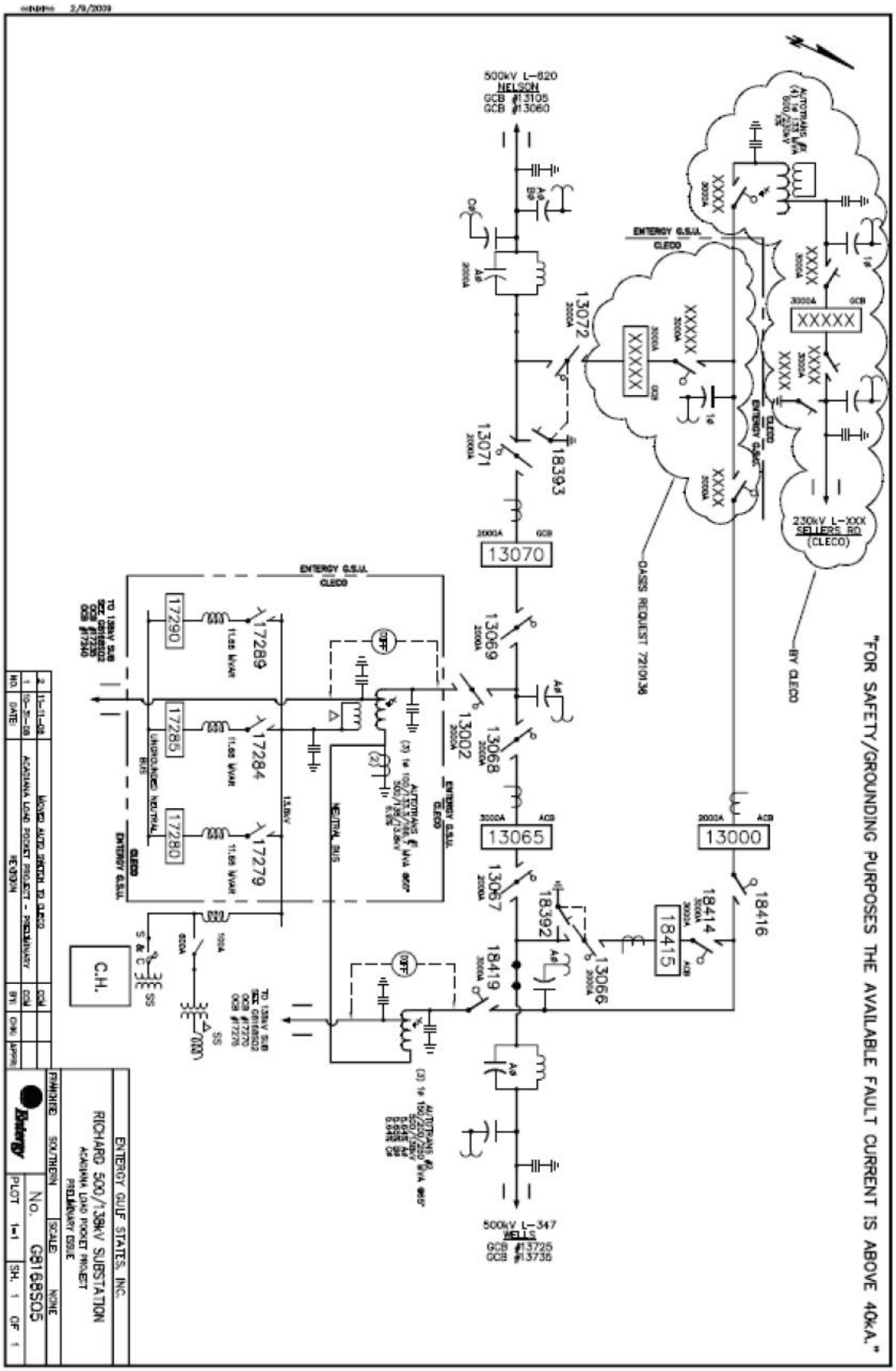
Acadiana Project Phase 2

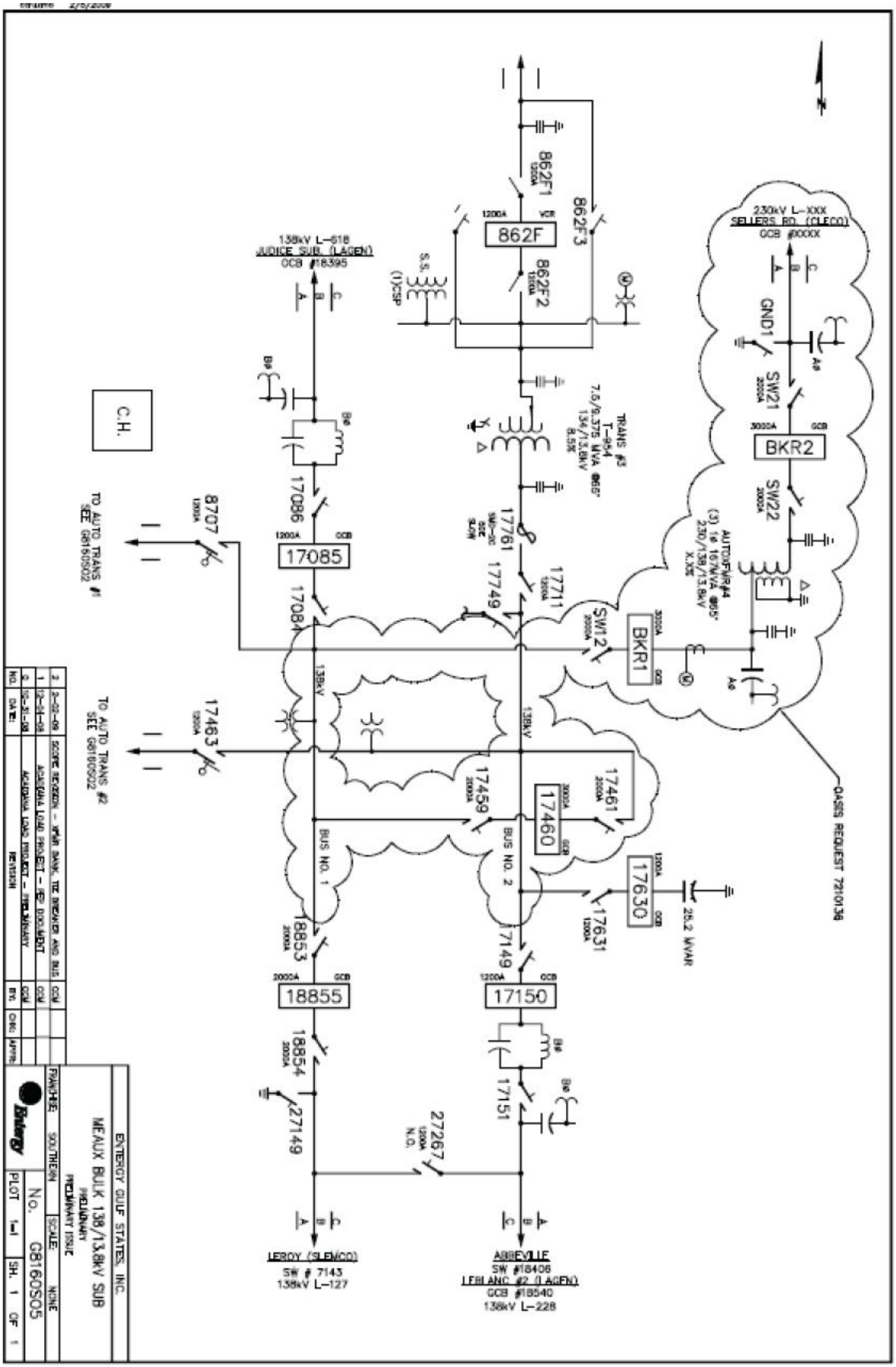
- Entergy to construct a new 230 kV, 829 MVA transmission line from the LUS Labbe 230 kV substation down to CLECO's Sellers Road substation. LUS to install breaker and terminal equipment at Labbe, CLECO to install breaker and terminal equipment at Sellers Road
- Entergy to construct a new 500 kV terminal connection at the Wells substation to facilitate the connection of the new 2nd CLECO 500-230 kV, 750 MVA autotransformer

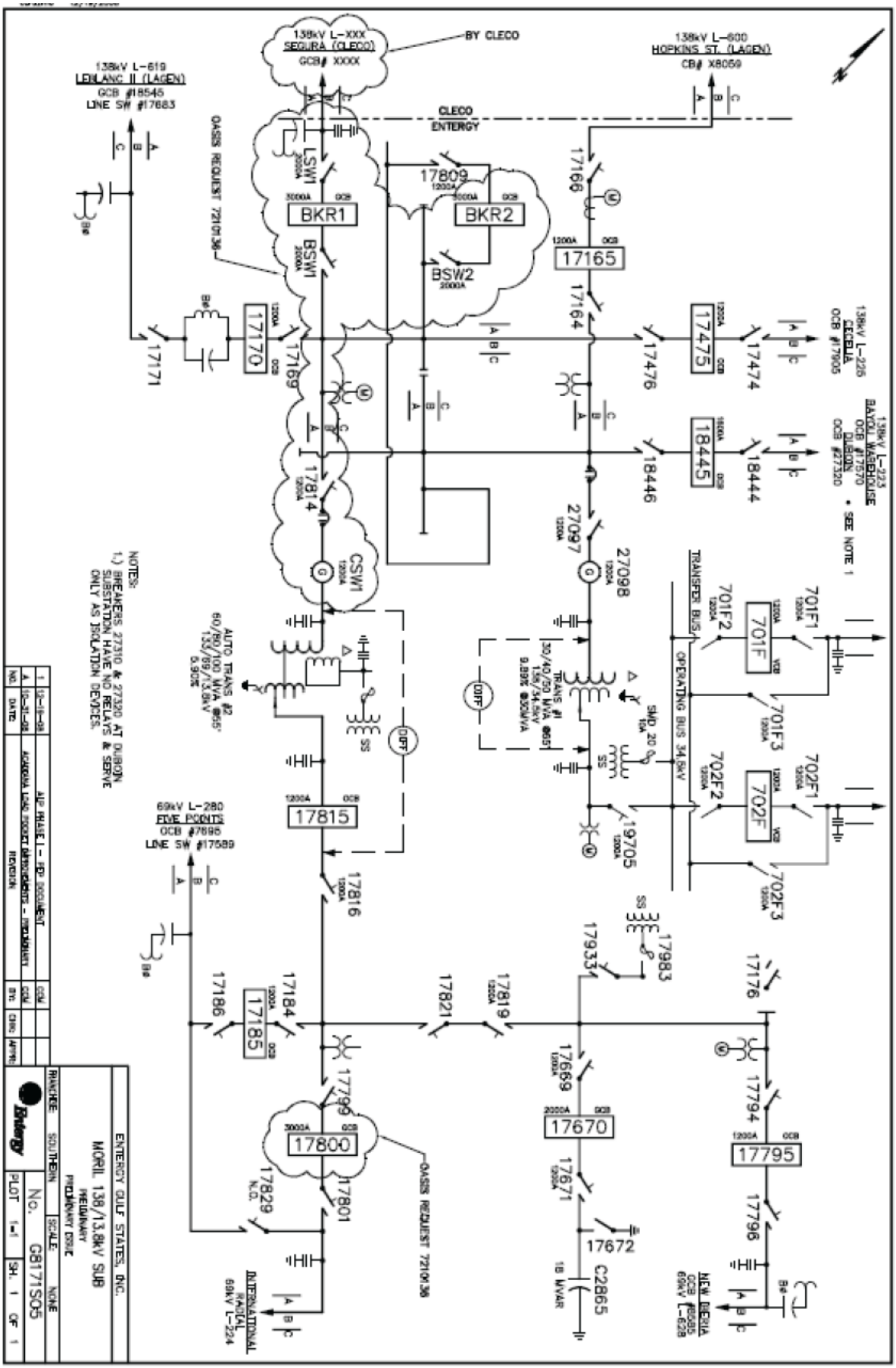

Entergy System
500 kV not shown
230 kV
115 kV not shown
PID 222
• Entergy to construct a new 230 kV, 714 MVA transmission line from the Bayou Steel to Tezcuco substation. Entergy to install a new 230 kV terminal at Bayou Steel.
Frisco
To Belle Point
Tezcuco
Bayou Steel
To Waterford 230 kV
Little Gypsy
To: Belle Point, Madisonville, Ponchatrain, University City

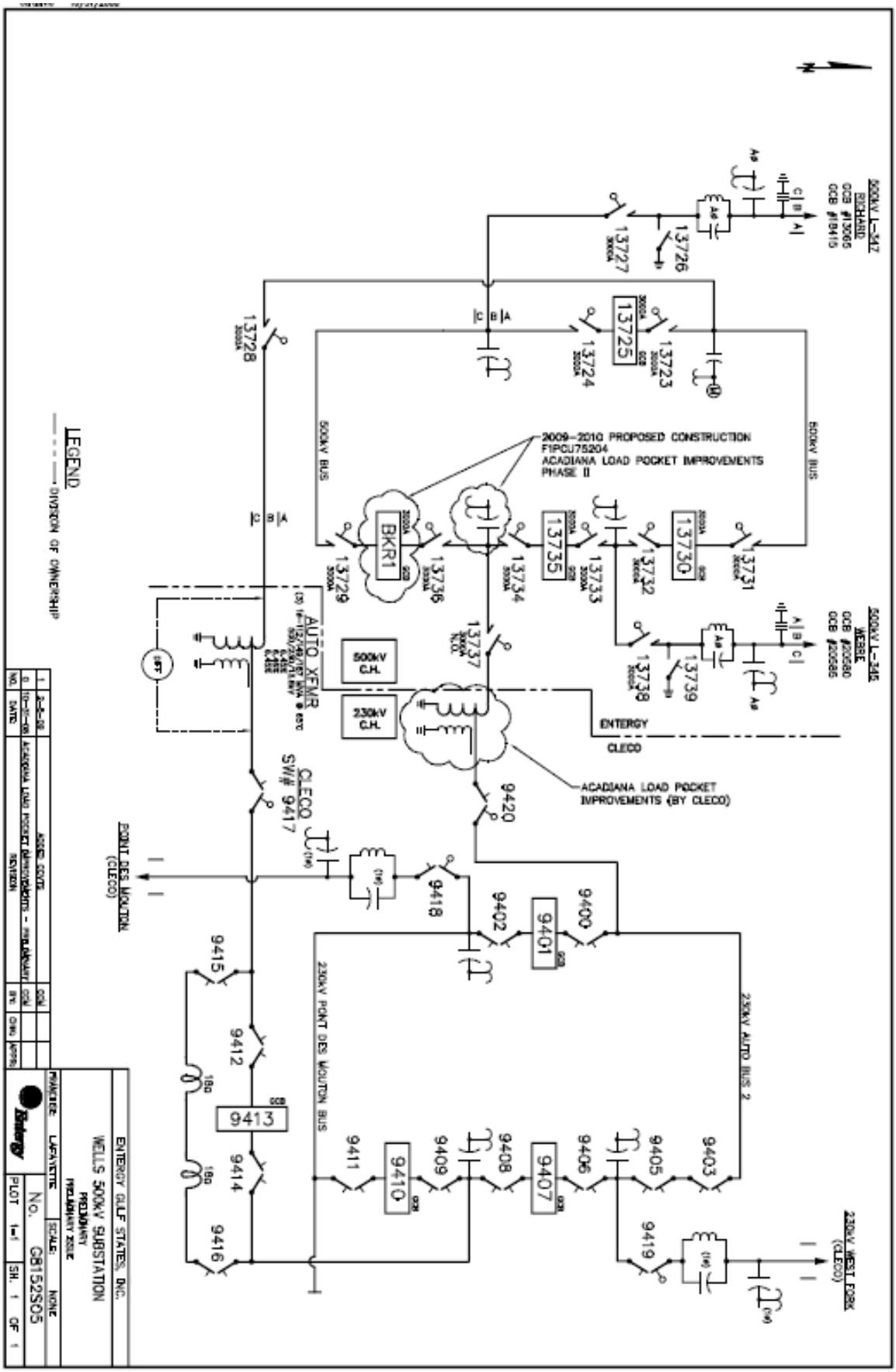
C. One Line Drawings

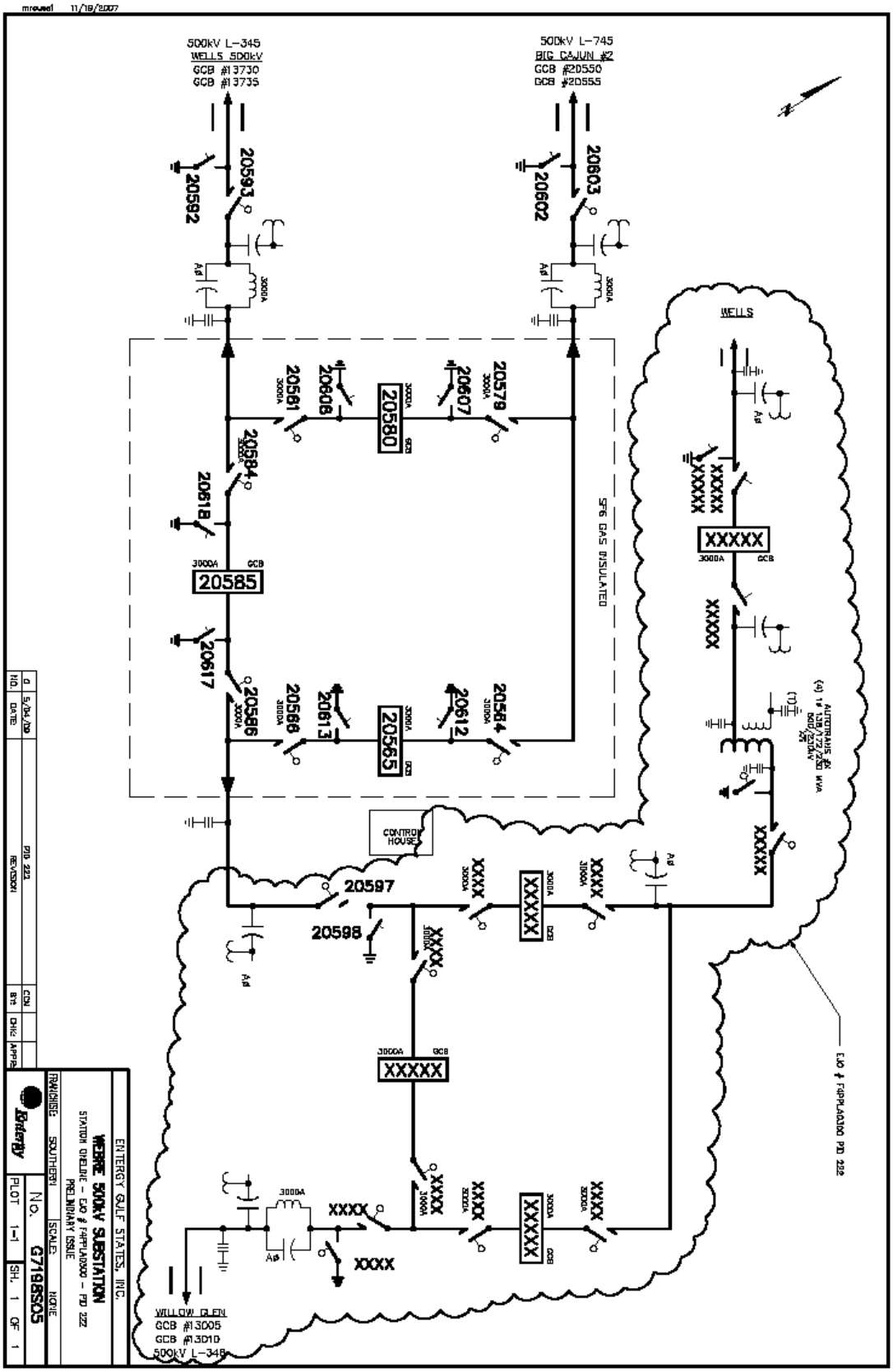
See images that follow.

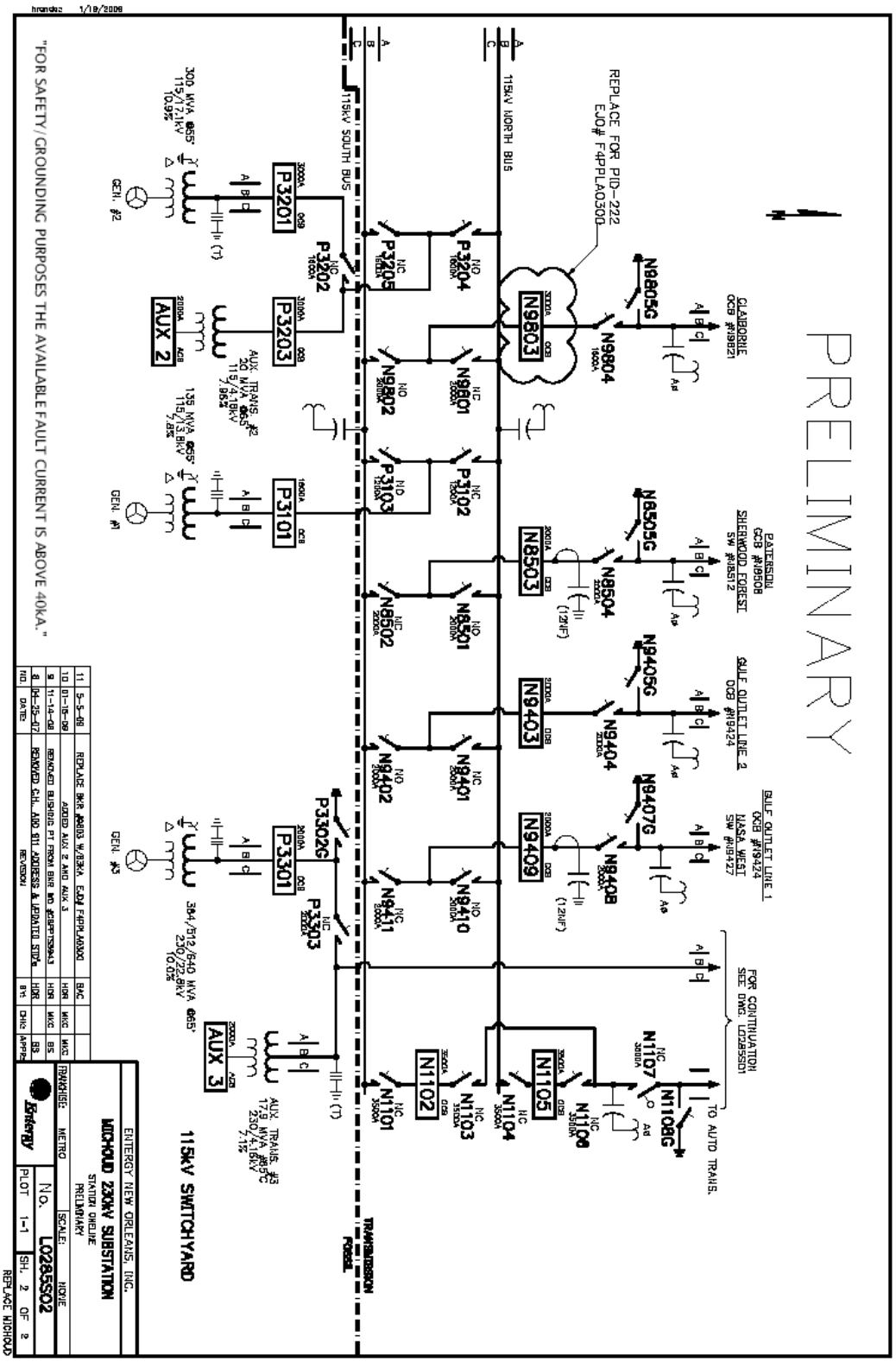

"FOR SAFETY/GROUNDING PURPOSES THE AVAILABLE FAULT CURRENT IS ABOVE 40kA."
500kV L-620
NELSON
GCB #5105
GCB #13060
230kV L-XXX
SELLERS RD
(CLECO)
OASIS REQUEST 721038
BY CLECO
500kV L-347
WELS
GCB #5725
GCB #5738
ENTERGY G.S.U.
CLECO
13070
13071
13072
18393
13069
13002
13068
13065
13067
18392
13066
18419
18415
18414
18416
13000
17290
17289
17285
17284
17280
17279
11.66 MVAR
13.8kV
NEUTRAL BUS
UNGROUNDED NEUTRAL BUS
C.H.
TO 138kV SUB
SEC #8168502
OCB #17270
OCB #17276
ENTERGY GULF STATES, INC.
RICHARD 500/138kV SUBSTATION
ACADIANA LOAD POCKET PROJECT
PRELIMINARY ISSUE
MODIFY AUTO SKETCH TO CLECO
ACADIANA LOAD POCKET PROJECT - PRELIMINARY
REVISION
DATE
NO.
DRN
CHK
APPR
FRANCHISE
SOUTHERN
SCALE
NONE
PLOT
1=1
SH.
1
OF
1
No.
G8168S05

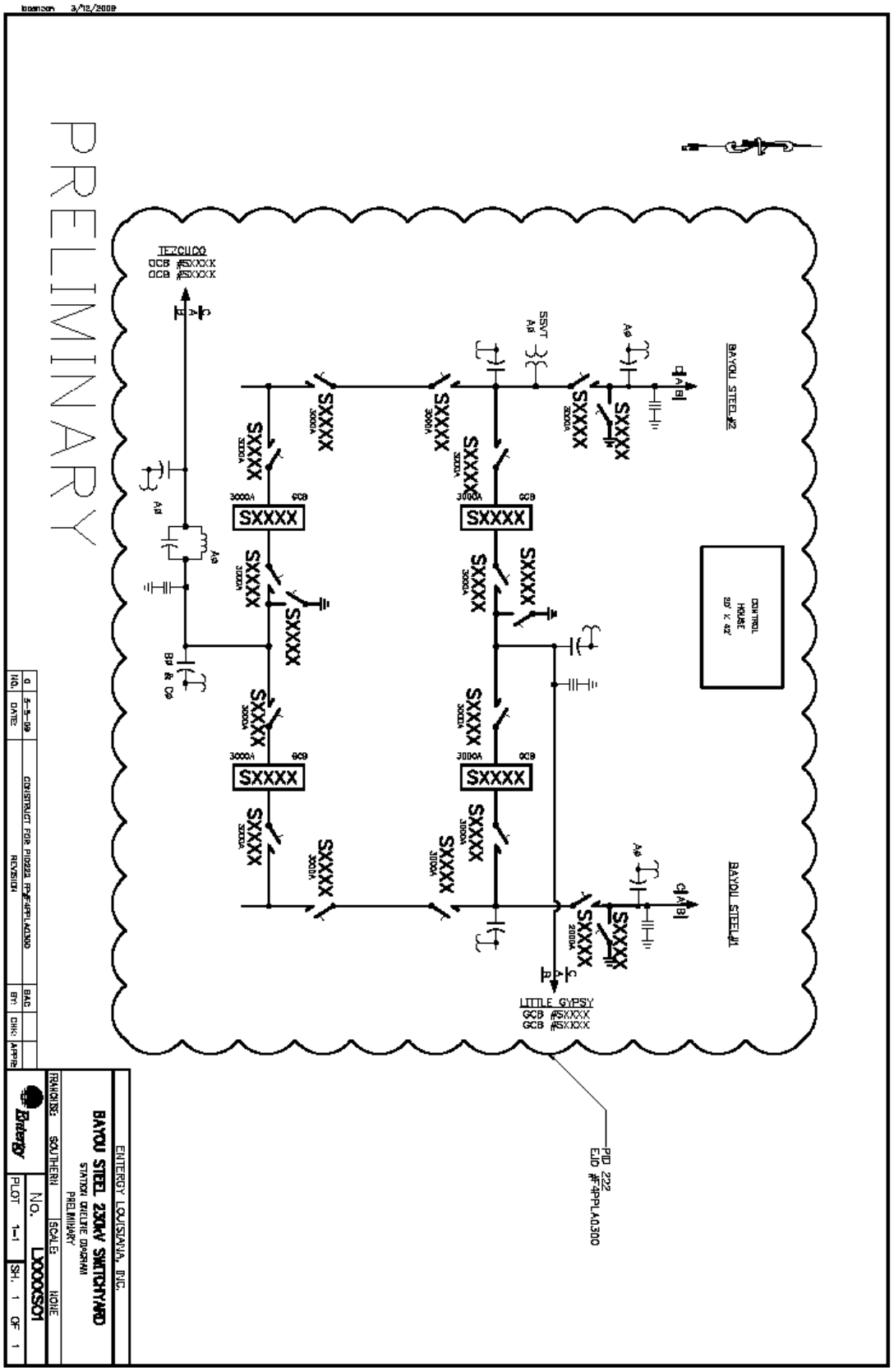

230kV L-XXX
SELLERS RD. (CLECO)
GCB #XXXX
GND1
SW21
BKR2
SW22
(3) 1Ø 167MVA @65°
230/138/13.8kV
X.X%
SW12
BKR1
OASIS REQUEST 72101
138kV L-618
JUDICE SUB. (LAGEN)
GCB #18395
862F1
862F
862F2
862F3
S.S.
(1)CSP
TRANS #3
T-954
7.5/9.375 MVA @65°
134/13.8kV
8.5%
17086
17085
17761
17749
17711
17084
8707
TO AUTO TRANS #1
SEE G81605002
C.H.
17463
TO AUTO TRANS #2
SEE G81605002
138kV
17459
17461
17460
BUS NO. 1
BUS NO. 2
17630
17631
26.2 MVAR
18853
18855
7149
17150
17151
18854
27149
27267
N.O.
LEROY (SLEMCO)
SW # 7143
138kV L-127
ABBEVILLE
SW #18406
LEBLANC #2 (LAGEN)
GCB #18540
138kV L-228
ENTERGY GULF STATES, INC.
MEAUX BULK 138/13.8kV SUB
PRELIMINARY
PRELIMINARY ISSUE
FRANCHISE: SOUTHERN
SCALE: NONE
PLOT No. G81605O5
SH. 1 OF 1
Entergy

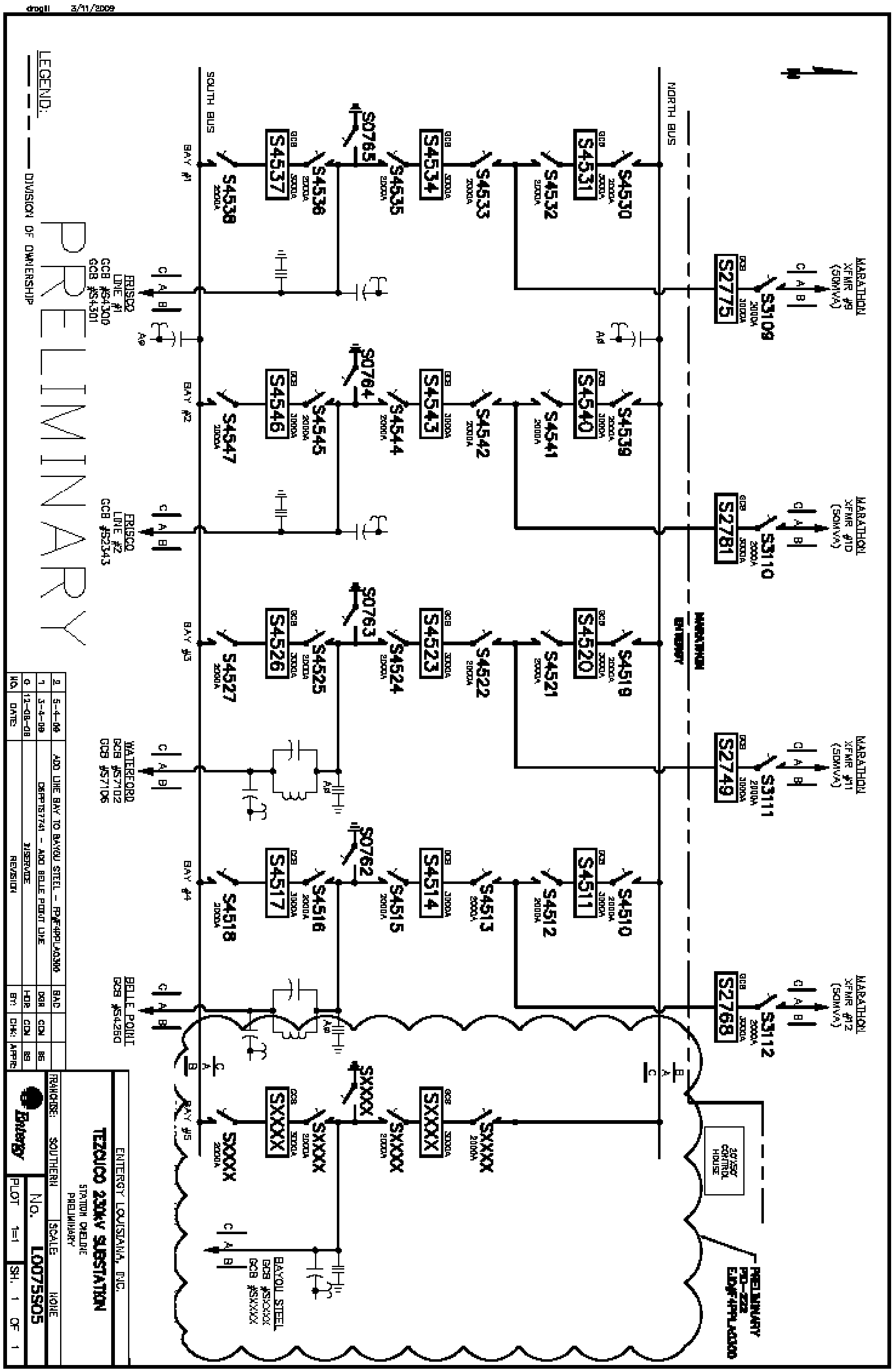

138kV L-XXX
SEGURA (CLECO)
GCB# XXXX
BY CLECO
138kV L-600
HOPKINS ST. (LAGEN)
CB# X8059
138kV L-619
LEBLANC II (LAGEN)
GCB #18545
LINE SW #17683
CLECO
ENTERGY
OASIS REQUEST 72101.36
LSW1
BKR1
BKR2
BSW1
BSW2
17809
17166
17165
17164
17475
17474
17476
18445
18444
18446
17170
17169
17171
17814
CSW1
27097
27098
138kV L-225
CECELIA
OCB #17905
138kV L-323
BAYOU WAREHOUSE
OCB #17870
DUBON
OCB #27320
* SEE NOTE 1
TRANSFER BUS
OPERATING BUS 34.5kV
701F1
701F2
701F
701F3
702F1
702F2
702F
702F3
SMD 20
10A
SS
DIFF
TRANS #1
30/40/50 MVA
115/34.5kV
9.89% @30MVA
AUTO TRANS #2
60/80/100 MVA @65°
115/69/13.8kV
5.90%
NOTES:
1.) BREAKERS 27310 & 27320 AT DUBON SUBSTATION HAVE NO RELAYS & SERVE ONLY AS ISOLATION DEVICES.
17815
17816
69kV L-280
FIVE POINTS
OCB #7695
LINE SW #17589
17933
17983
17176
17819
17821
17186
17184
17185
17669
17670
17671
17672
C2865
18 MVAR
17794
17795
17796
17799
17800
17801
17829
N.O.
OASIS REQUEST 72101.36
INTERNATIONAL PAPER
RADIAL
69kV L-224
NEW IBERIA
OCB #8585
69kV L-628
ENTERGY GULF STATES, INC.
MORIL 138/13.8kV SUB
PRELIMINARY
PRELIMINARY ISSUE
FRANCHISE: SOUTHERN
SCALE: NONE
PLOT 1=1
SH. 1 OF 1
No. C8171S05
Entergy
1 10-16-08
A 10-31-08
NO. DATE
ADD PHASE I - SEE DOCUMENT
ACADIANA LOAD PROJECT IMPROVEMENTS - PRELIMINARY
REVISION
GCM
DRN.
CHKD.
APPVD.

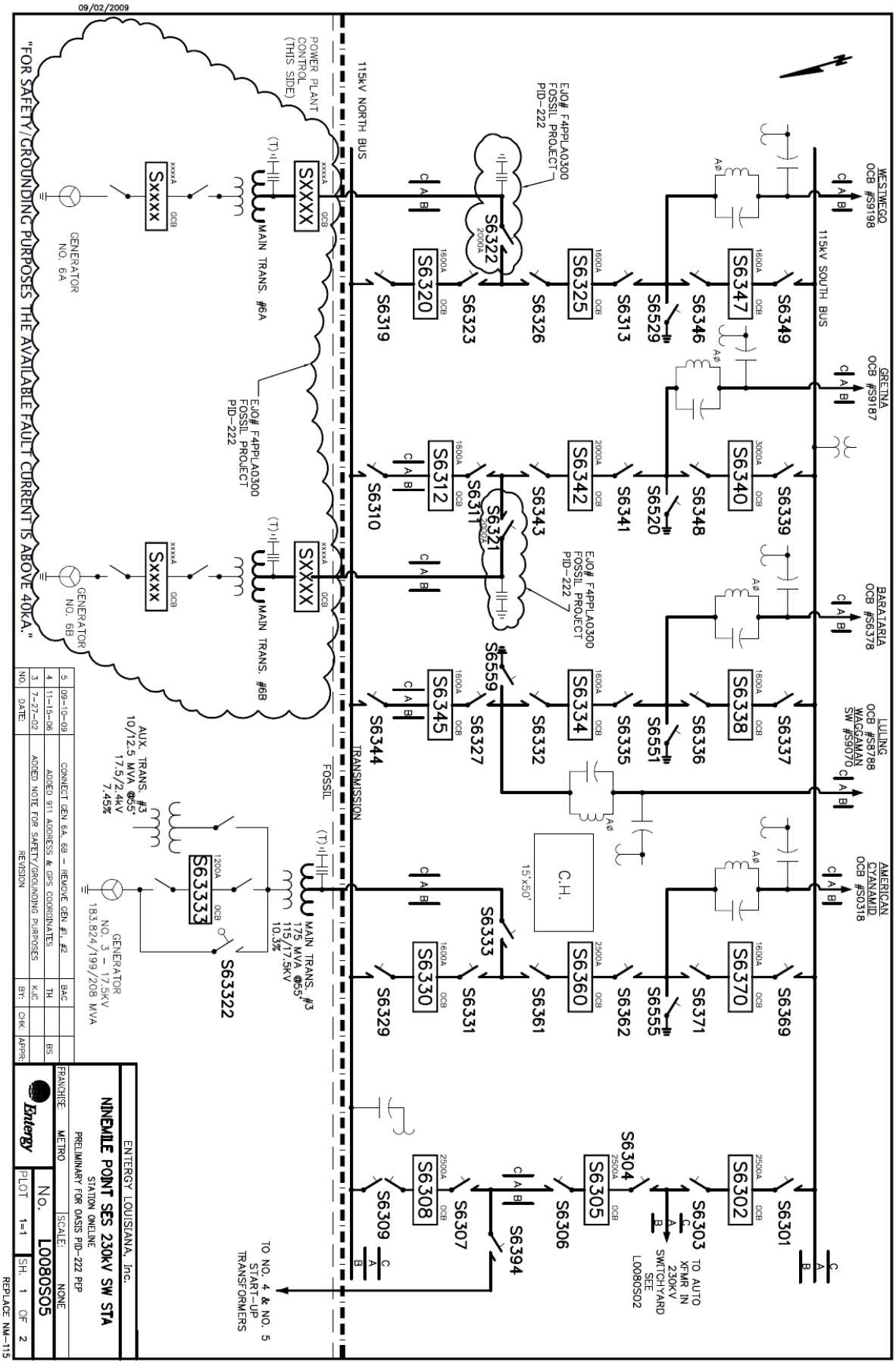

500kV L-342
BIGHAM
OCB #13065
OCB #18415
500kV L-345
WESSE
OCB #20580
OCB #20585
2009-2010 PROPOSED CONSTRUCTION
F1PCU75204
ACADIANA LOAD POCKET IMPROVEMENTS
PHASE II
500kV BUS
BKR1
AUTO XFMR
500kV CB
230kV CB
ENTERGY
CLECO
ACADIANA LOAD POCKET
IMPROVEMENTS (BY CLECO)
CLECO SW# 9417
230kV AUTO BUS 2
230kV PONT DES MOUTON BUS
230kV WEST FORK
(CLECO)
PONT DES MOUTON
(CLECO)
LEGEND
DIVISION OF OWNERSHIP
ENTERGY GULF STATES, INC.
WELLS 500kV SUBSTATION
PRELIMINARY
PRELIMINARY SCALE
LAFAYETTE
NONE
G8152S05
PLOT 1=1
SH. 1 OF 1


500kV L-345
WELLS 500kV
GCB #13730
GCB #13735
500kV L-745
BIG CAJUN #2
GCB #20550
GCB #20555
20593
20592
20603
20602
20561
20606
20580
20607
20579
20584
20618
20585
20617
20586
20566
20613
20565
20612
20564
SF6 GAS INSULATED
WELLS
XXXXX
XXXX
CONTROL HOUSE
20597
20598
EJO # F6PPLA6D00 PID 222
WILLOW GLEN
GCB #13005
GCB #13010
500kV L-348
ENTERGY GULF STATES, INC.
WEBRE 500kV SUBSTATION
STATION ONELINE - EJO # F6PPLA6D00 - PID 222
PRELIMINARY ISSUE
FRANCHISE: SOUTHERN
SCALE: NONE
PLOT NO. G71985S05
SH. 1 OF 1
PID 222
RE-VISION
DATE
DRN
CHK
APPR


PRELIMINARY
115kV NORTH BUS
115kV SOUTH BUS
REPLACE FOR PID-222
EJO# F4PPLA0300
N9805G
N9804
N9803
N9802
N9801
P3204
P3205
P3202
P3203
P3201
N8505G
N8504
N8503
N8502
N8501
P3102
P3103
P3101
N9405G
N9404
N9403
N9402
N9401
P3302G
P3303
P3301
N9407G
N9408
N9409
N9410
N9411
N1108G
N1107
N1106
N1105
N1104
N1103
N1102
N1101
BAYTOWN GCB #N9508 SHERWOOD FOREST SW #N8512
GULF OUTLET LINE 1 GCB #N9424 MASA WEST SW #N9427
GULF OUTLET LINE 2 GCB #N9424
CLAIBORNE GCB #N9821
TO AUTO TRANS.
FOR CONTINUATION SEE DWG. L0285SD1
AUX 2
AUX 3
GEN. #1
GEN. #2
GEN. #3
AUX. TRANS. #2 20 MVA 115/4.16kV 9.96%
AUX. TRANS. #3 17.9 MVA 230/4.16kV 7.15%
115kV SWITCHYARD
TRANSMISSION FORCE
"FOR SAFETY/GROUNDING PURPOSES THE AVAILABLE FAULT CURRENT IS ABOVE 40kA."
ENTERGY NEW ORLEANS, INC.
MICHOUD 230kV SUBSTATION
STATION ONELINE
PRELIMINARY
FRANCHISE: METRO
SCALE: NONE
DRAWING NO. L0285S02
PLOT 1-1
SH. 2 OF 2
REPLACE MICHOUD


PRELIMINARY
BAYOU STEEL #2
BAYOU STEEL #1
CONTROL HOUSE
TEXCUCO
LITTLE GYPSY
PID 222
EID #F4PPLA0300
ENTERGY LOUISIANA, INC.
BAYOU STEEL 230kV SWITCHYARD
STATION ONELITE DIAGRAM
PRELIMINARY
SOUTHERN
NONE
L0000S01


PRELIMINARY
LEGEND:
DIVISION OF OWNERSHIP
NORTH BUS
SOUTH BUS
ENTERGY LOUISIANA, INC.
TEZCUCO 230kV SUBSTATION
STATION ONELINE
L0075S05



NO.	DATE:	REVISION	BY:	CHK:	APPR:
5	09-10-09	CONNECT GEN 6A, 6B - REMOVE GEN #1, #2	BAC		
4	11-15-06	ADDED 911 ADDRESS & GPS COORDINATES	TH		BS
3	7-27-02	ADDED NOTE FOR SAFETY/GROUNDING PURPOSES	KJC		

ENTERGY LOUISIANA, Inc.

NINEMILE POINT SES 230KV SW STA

STATION ONELINE

PRELIMINARY FOR OASIS PID-222 PEP

FRANCHISE: METRO | SCALE: NONE

Entergy | PLOT 1=1 | No. L0080S05 | SH. 1 OF 2

REPLACE NM-115

ADDENDUM A: MATERIAL MODIFICATION REVIEW AND UPGRADE SCOPE/COST ESTIMATE

On May 11, 2011, the requesting Customer submitted revised data in the form of Attachment A to Appendix 1 to correctly reflect the technical parameters of the facilities studied for PID 222. The Customer requested the ICT to evaluate the revised data to determine if the change in parameters would constitute a Material Modification as defined in Attachment N of Entergy's OATT.

A review was performed by the ICT and the results were posted on Entergy's OASIS in the form of a revision to the System Impact Study for PID 222. The results were documented in the 8/29/11 revision through *Addendum A for Material Modification Evaluation*. The revised report can be found at the following location: http://www.oatioasis.com/EES/EESDocs/PID_222_SIS_Final_DRAFT.pdf.

It was determined through this review that the change in technical parameters for the PID 222 facility **did not** constitute a Material Modification as defined in Attachment N of Entergy's OATT. However, it was determined through the Short Circuit Analysis a breaker located in the Ninemile 115kV substation would require replacement.

This addendum includes the upgrade scope and cost estimate of the breaker replacement at the Ninemile 115kV substation only. No additional revisions were made to this Facilities Study for the purpose of this Material Modification review.

Ninemile Switchyard: Replace 115 kV breaker S6342

General

Replace the existing OCB S6342 with a 63kA, 3000A, Independent Pole Operation (IPO) breaker. The IPO breaker is installed as three (3) individual single-phase units. Each unit has a control cabinet and the set has a master control cabinet. Conduit and cabling will be required from each phase to the master cabinet and from the master cabinet to the control house. The cables have 'Plug & Play' connectors.

Site

Limited site work will be needed. It is estimated that 100 tons of limestone will be needed in order to back fill trenches and clean up and grade site after construction is completed.

Foundations

- Expand the existing 17'-6" by 6'-0" foundation for breaker S6342 to 27'-0" by 10'-0" to accommodate the new IPO breaker. A 10" wide by 6" deep trough will be formed into the 27' length of the foundation expansion. A 2' x 2' pull box will be formed into the trough on the northeast corner of the foundation.

  NOTE: Because the cables are 'Plug & Play', embedding conduit in the foundation is not an option. An alternative to the installation of the trough is to install 10" cable tray, fastened to the foundation, between the units.

- Install six (6) 2” PVC conduits from the pull box on the northwest corner of the expanded foundation to a new pull box located approximately 50’ to the north. Approximately 300’ total of conduit will be required.
- Install six (6) pigtails of 19#9 Copperweld wire to ground both legs of each breaker unit back to the ground grid.

Electrical

- Remove one (1) OCB breaker (S6342) and jumpers.
- Install one (1) GCB 3000A, 3000A, IPO breaker. The breaker is installed as three (3) individual single-phase units.
- New cables will be required from each unit to the master cabinet and from the master cabinet to the control house. The breaker is supplied with ‘Plug & Play’ cables.
- Jumpers from breaker S6342 to switches S6341 and S6343 will be constructed of 2 1/2” Sch. 80 aluminum tubing.
- Connect 19#9 CU grounding wire to each of the breaker units.

Relay

- Since the System Impact Study for PID 222 revealed a fault would not be cleared fast enough with the current breaker, OCB S6342, it will be replaced with a new IPO breaker, which means new relaying will be needed to replace the original relaying associated with the original OCB S6342.
- The Gretna line panel will need to be replaced to accommodate single pole tripping for OCB S6342 as well as gang operation for the adjacent breaker, S6340. This will be accomplished by using a breaker control panel for S6342 which will have provisions for IPO breakers and a line/breaker protection panel for Gretna line and OCB S6340.
- New alarms will be pulled from this panel. A new DNP DI card will be needed for the new status points to accommodate this change. There should be sufficient control points to facilitate the new panel.
- The existing line tuner and carrier set will be reused.
- The existing main transformer #1 differential scheme will need to be reviewed to determine whether modifications are needed for single pole tripping for OCB S6342 (transformer faults should trip all 3 phases).
- Existing cable will be removed, and new cable will be needed to accommodate independent pole tripping on OCB S6342.
- Currently, another study is underway to determine whether the adjacent breaker, S6340, will need to be changed to an IPO as well. In the event that this breaker is changed out, the protection scheme from this scope may need to be revised to accommodate single-phase tripping of S6340.

Relay Settings

- Develop new relay settings for Ninemile-Gretna 115kV line relay panel.
- Develop new relay settings for S6342 breaker control panel.
- Review/revise transformer #1 differential panel settings.
- Review/revise Ninemile 115kV bus diff settings as per new breaker and available CTR (PVD11C)
- Update all the documentation in Webtop, ASPEN modeling, and provide field support as necessary.
- Relay impact analysis will be performed during PEP stage.
- Coordinate and communicate the setting changes with generation team as per PRC-001

Communications and SCADA

- The existing SEL 2032 is nearly filled to capacity. Because of this, a D400S will be needed to upgrade the existing communication processor and the existing SEL 2032 will then be connected to a port on the D400S. The new D400S will be used as a master with the existing D20 acting as a slave. Also, a SEL 2407 satellite clock and additional accessories and peripherals will be needed to facilitate this change (SCADA NET provisions will be required as well as determining Aurora Vulnerability Protocols, since this particular station has generation).
- Revise the existing RTU to include new alarms.
- Configure D400S.

Metering: N/A

Construction

- All substation foundation construction for replacing the breaker at Ninemile 115kV substations will be contracted out. It is assumed that this work will be competitively bid.
- It is currently assumed that all substation steel/electrical and relay construction will also be contracted out. However, Entergy's internal operations resources may perform some of this work with in-house crews, provided resources are available to work within the project schedule and budget requirements.
- Ninemile 115kV Switchyard --- Construction tasks to replace breaker S6342
    - Install conduit, grounding, and modifications to the breaker foundation. Due to limited construction space and underground duct banks, hand digging may be utilized to install conduit and grounding. (4 weeks)
    - Remove existing OCB 115kV breaker, jumpers, etc. (1 week)

- Install new 115 kV line breaker (3 weeks). This work will consist of: installing the breaker, making up jumpers, install panels, pull control cables, and associated relay work.
- An outage on the T-Line from Ninemile to Gretna will be needed in order to install the breaker.
- The relay work at Ninemile will need to coincide with these activities.

Cost

The ICT has reviewed and determined whether each required upgrade will be considered a Base Plan Upgrade or a Supplemental Upgrade. For more information on cost responsibility for Base Plan and Supplemental Upgrades, see Attachment T to Entergy's OATT.

The costs shown in the table include overheads and AFUDC, but do not include tax gross up. Entergy incurs a tax liability proportional to the amount of customer contributions. In addition to proposed project costs, the customer may be charged a "Tax gross-up" (TGU) at applicable rates. Rates are subject to change. TGU is not included in any of the estimates.

Cost Analysis

	TOTAL w/ overheads	**Base Case**	**Supplemental**
Ninemile: replace 115 kV breaker	$753,488	**-**	$753,488

Schedule

The additional scope of work identified in this addendum will be completed in conjunction with and during the same timeframe as the scope of work described in PID 222. A detailed schedule will be prepared subsequent to customer approval to proceed with the project.