



**TRANSMISSION LINE & SUBSTATION PROJECTS**

**COMPANY: ENTERGY GULF STATES LOUISIANA**

**CUSTOMER: PID 256**

**FACILITIES STUDY**

**EJO NO. F4PPGS0502**

**PID 256 GENERATOR INTERCONNECTION**

Revision:  
0

<b>Rev</b>	<b>Issue Date</b>	<b>Description of Revision</b>	<b>Prepared By</b>	<b>Approved By</b>
A	10/6/11	Initial Draft by PM	BPH	
B	11/3/11	Final Draft with Team Input	BPH	RT
C	10/10/11	JET Approval	BPH	RT
D	12/7/11	Issued to ICT	MG	BW
0	12/16/11	ICT Review and Upgrade Classification	EC	BR

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## **1. PROJECT SUMMARY**

### **1.1 Background and Project Need**

The purpose of this Facilities Study is to determine the availability to connect a new generation facility and provide the transfer capability at the point of interconnection. This Facilities Study will evaluate PID 256 request for interconnection of a total of 90 MW of generation. The Customer has requested a 20% estimate. Based on available time to complete the Facilities Study and in light of lack of survey, soil borings, environmental permitting, property owner's issues, etc, a good faith estimate has been provided. Many assumptions had to be made which could affect the overall accuracy of this estimate.

To evaluate this request, a study was performed on the latest available 2014 summer peak cases, using PSS/E and MUST software by Power Technologies Incorporated (PTI). The short circuit study was performed on the Entergy system short circuit model using ASPEN software.

The Facilities Study will identify the transmission interconnection requirements, any transmission constraints resulting from the requested power transfer, and any additional study also includes cost estimates to correct any transmission constraints.

The Customer has requested Energy Resource Interconnection Service (ERIS) only. The System Impact Study indicated that under ERIS, the additional generation due to PID 256 generator does not cause an unacceptable increase in short circuit current or any stability violations; therefore no network upgrades were identified for ERIS.

### **1.2 Customer Facilities**

The Customer plans to execute a modernization and expansion project at their facility in Lake Charles, Louisiana. The project will entail adding approximately 20 MW of loads and a 90 MW co-generator at the facility.

The Customer has executed a study to determine how Entergy will serve the 20 MW retail load addition at the facility. To serve the 20 MW load addition, Entergy plans to construct a new 230kV switching station, Granger Switchyard, on the Customer's site. The Granger Switchyard will be cut-in on the Vincent to Graywood 230kV transmission line. The Granger Switchyard will be constructed as an expandable three breaker 230kV ring bus station.

In order to facilitate interconnection of the proposed 90 MW generator (PID 256), one (1) additional 230kV breaker will be added to the 230kV ring bus at the aforementioned Granger Switchyard. Revenue metering and differential line relaying will also be required for the installation. The Customer has assumed responsibility to build, own and operate a ~0.6 mile 230kV generator tie circuit from the Granger Switchyard to their generator step up transformer.

This study assumes that both the load addition project and PID 256 will be approved and that construction of both projects will occur concurrently. If the 20 MW Load Addition Project is not approved, this study is null and void.

### 1.3 Scope Summary

#### A. Scope for NRIS:

NRIS was not selected by the Customer.

#### B. Scope for ERIS:

The overall scope of this project is summarized as follows:

**Granger 230kV Switchyard** – The scope at Granger 230kV Switchyard assumes that the three breaker switchyard was previously constructed to address the 20 MW Load Expansion Project. If the 20 MW Load Expansion Project does not occur, Granger Switchyard will not exist and this study is void.

PID 256 will require installation of one additional 230kV breaker which will create a fourth 230kV node at Granger Switchyard. In addition to the breaker installation, Entergy will also install 230kV revenue metering and dual primary, direct fiber line differential relaying for the proposed Customer generator interconnection. The point of delivery for this study is defined as the bolted electrical connection between the Customer transmission line jumper/riser and the Entergy buswork in the PID 256 line bay at Granger Switchyard.

The Customer requested project ISD is March 2013. No upgrades are required at any remote sites to complete this project scope.

### 1.4 Impact of Priors

PID 256 is part of a co-generation project. This study assumes that both the load addition project and PID 256 generator addition project will be approved and that construction of both projects will occur concurrently. If the 20 MW Load Addition Project is not approved, this study is null and void.

### 1.5 Cost Summary

#### A. Cost for NRIS:

NRIS was not selected by the Customer.

#### B. Cost for ERIS:

- The estimated total project cost is **\$805,442 Full Financial**. This cost does not include Tax Gross Up which may apply.
- The ICT has assigned **\$805,442** as Supplemental Upgrade based on Attachment "T" of Entergy's ICT (Independent Coordinator of Transmission) filing to the FERC.

### 1.6 Schedule Summary

The Customer's requested in service date for this interconnection is March 2013. The planned ISD of 3/8/2013 is based on several scope assumptions that are detailed throughout this document. When this project is approved, all assumptions will be validated through front end loading (FEL).

The table below includes an estimated completion date for each Entergy work order that is required to complete the Customer interconnection. These dates are based on a preliminary project schedule and assume that funding authorization is

obtained no later than January 16, 2012. No significant outage approvals or permitting requirements have been identified.

WO Name	Requested ISD	Estimated ISD
Install 230kV Breaker Position at Granger Switchyard	March 2013	March 8, 2013

**1.7 Long Lead and Major Material / Equipment**

Quantity	Material Description	Lead Time (Weeks)*
3 ea.	Relay Panels (Line breaker control, Breaker control, and metering)	12-14
4 ea.	High Capacitance CCVT	30-32
3 ea.	High accuracy metering CT, bi directional	30-32
1 ea.	230kV Circuit Breaker, 3000A, 40kA	14-16
1 Lot	Substation Structural Steel (all types)	14-16

\*As of 12/13/2011

**2. SAFETY**

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. The *National Electric Safety Code* and the *National Electrical Code* will be used as the standards in the design and construction of the identified projects.

Should the work contained within this Facilities Study be approved, a detailed Safety Plan will be formulated and incorporated within the project plan. All employees and contractors shall follow the latest revision of the Entergy Safety Manual.

The switchyard expansion will occur near energized 230kV buswork. Entergy Substation Design considered safety issues associated with future expansion of the switchyard as part of the design for the 2 MW Load Expansion Project. Granger Switchyard will be designed and constructed such that it could safely be expanded with the fourth breaker position needed for this work scope. All construction will occur near energized 230kV buswork. Precautions will be taken when planning all construction activities.

**3. GENERAL ASSUMPTIONS**

Upon receipt of formal approval from Customer authorizing design and construction, Entergy will prepare a detailed project execution plan

Granger Switchyard will be designed and constructed such that it could safely be expanded with the fourth breaker position needed for this work scope. All ROW, site, and environmental issues have been addressed during that project, and the site is ready for construction of the interconnection elements needed for PID 256.

## 4. SCOPE OF WORK

### 4.1 Interconnection Facilities

#### Substation

##### General

- Refer to Attachment A for area map.
- Refer to Attachment B for Granger Switchyard Oneline (S05).
- Refer to Attachment C for Granger Switchyard Electrical Arrangement (EA1).
- Refer to Attachment D for Granger Switchyard EA1 site overview.
- Granger Switchyard is currently configured as a three breaker ring bus. The site will be modified to accommodate one (1) additional 230kV breaker position which will create a new line bay for the Customer generator interconnection.
- All Entergy drawings are preliminary and are based on the Customer 230kV generator circuit connecting on the northwest side of Granger Switchyard.
- The point of delivery for this study is defined as the bolted electrical connection between the Customer transmission line jumper/riser and the Entergy buswork in the PID 256 line bay at Granger Switchyard.
- All 230kV substation equipment will be rated a minimum of 2000A continuous with maximum fault current of 40kA.
- A 230kV bus outage is required at Granger Switchyard to construction the interconnection facilities. This outage will open the 230kV ring at Granger Switchyard for the outage duration but will not force an Entergy or a Customer Line outage

##### Site

- This scope assumes that all Granger Switchyard site preparation was previously performed under the 20 MW Load Expansion Project.
- Minor site work is required at Granger Switchyard in order to repair site damage caused by heavy equipment during construction of PID 256. This estimate assumes that 30 tons of crushed rock will be needed to repair site damage.
- Minimal site disturbance will be caused by this project. As a result, a Storm Water Management Pollution and Prevention Plan (SWMP) and a Notice of Intent are not required.
- Soil borings and soil resistivity tests will not be obtained for this project. Instead, this information will be obtained from records obtained from the 20 MW Load Expansion Project.

- This scope assumes that no additional switchyard drainage is required for the breaker addition.
- A Phase 1 Environmental Assessment is not required for this installation.
- Site Prep quantities are as follows:
  - Thirty (30) cubic tons of limestone to repair construction damage to the switchyard grade
  - Haul 50 cubic yards of spoil dirt (stockpiled at a location TBD on Customer's property)

### **Foundations**

Any foundations required for the 230kV breaker addition will match existing type and size as specified by the 20 MW Load Expansion Project.

A Spill Prevention, Control and Countermeasures (SPCC) plan is not required for this site due to absence of large transformers.

The following foundations will be installed:

- One (1) 1Ø low-profile bus support.
- One (1) low switch support. The foundation consists of two footers.
- One (1) 230kV, 3000A 40kA gas circuit breaker.
- One (1) 230kV "A" frame dead end structure. The foundation consists of four (4) footers.
- Ten (10) equipment pedestals as follows:
  - Four (4) - 230kV CCVT.
  - Three (3) - 230kV metering CT.
  - Three (3) - 230kV arrester.
- Install approximately 320' of 2" PVC conduit. Six (6) 2" PVC conduits will be installed from the circuit breakers to the existing cable trench. Two (2) 2" PVC conduits will be installed from the CCVT/CT junction box to the existing cable trench. One (1) 2" PVC conduit will be installed from the CCVT/CT junction box to each of the appropriate CCVTs/CTs. One (1) 2" PVC conduit will be installed from the dead end structure to the cable trench for fiber optic cable.
- Install approximately 500' of 19 #9 copperweld for the new construction. All new construction including 19 #9 copperweld "pigtails" will be tied to the existing 4/0 ground grid as per Entergy grounding standards.

### **Electrical**

The existing 230kV switchyard four breaker ring bus configuration will be completed by adding one (1) additional circuit breaker and the associated

disconnect switches. The new line bay will be installed on the northwest side of the switchyard with line switches.

The following equipment will be installed:

- One (1) 230kV, 3000A 40kA gas circuit breaker.
- Three (3) 230kV metering CTs will be mounted on 8'-6" equipment pedestals.
- Four (4) 230kV CCVTs will be mounted on 8'-6" equipment pedestals.
- One (1) 230kV 2000A vertical break horizontal mount disconnect switches will be mounted on existing 12'-5 1/8" switch stand.
- One (1) 230kV 2000A vertical break horizontal mount disconnect switches will be mounted on 12'-5 1/8" switch stand. The switch is designated as Customer line switch and will be equipped with a ground switch attachment.
- One (1) 230kV "A" frame dead end structure. The dead end will have a 60' transmission line pull off height (rated at 6000 pounds per phase) and a 70' static mast pull off height (rated at 2500 pounds per static).
- One (1) 230kV 1Ø low-profile bus support.
- Three (3) 230kV lightning arresters will be mounted on 8'-6" pedestals.
- Install approximately 20' rigid bus and 300' of strung bus. All new rigid bus will be 4" Schedule 40/80 Aluminum tubing. All new strung bus will be bundled 954MCM aluminum conductor. 666MCM dampening cable will be installed in all horizontal bus runs.

### Relay

- Entergy will install dual primary differential line relaying on the proposed 230kV Customer generator node inside the Granger Switchyard. The relay scheme will utilize a SEL 311L and a SEL 421 as per Entergy standard PM1803 Option C2. (DISCLAIMER: The Customer shall install a comparable line control panel that will communicate with Entergy's line control panel via fiber. The line panel should be a 421/311L relay panel. Entergy will provide standard PM1803 option C2 for reference.)
- Entergy will install one (1) 28" breaker control panel using SEL 451 per Entergy Standard PM0501 option B.
- Entergy will install three (3) 230kV metering accuracy current transformers (CT's) in the Customer generator line bay at the Granger Switchyard for line relaying and revenue metering.
- Entergy will install one (1) 230kV single-phase CCVT inside of the Granger Switchyard to be used for generator line indication and synchronization.
- Entergy will install three (3) 230kV CCVTs inside of the Granger Switchyard to be used for line relaying potentials.



- Entergy will install one (1) 230kV, 3000A, 40kA transmission breaker inside the Granger Switchyard.
- Entergy will install one (1) over-under voltage protection panel.
- Entergy will install one (1) metering panel.
- The control house size at Granger Switchyard is adequate to accommodate the additional line and meter panels required for this work scope.
- The existing D400 RTU is adequate to accommodate the additional status and indication points required for this work scope.
- The existing battery set at Granger Switchyard is adequate to accommodate the additional DC control house load created by this work scope.
- The existing control house AC and DC panels are adequate to accommodate the additional electrical load created by this work scope.
- Granger Switchyard voice and data communication to the Entergy Transmission Operations Center (TOC) and the Entergy System Operations Center (SOC) will be communicated over TELCO T1 circuit.
- Entergy will communicate data and/or indication from the Granger Switchyard RTU to the Customer generator via Customer owned OPGW. This fiber optic path will be routed in the shield position on the Customer owned 230kV generator circuit. Specific Customer data requirements will be detailed upon project approval.
- A fiber optic patch panel will be installed to terminate the OPGW inside the Granger Switchyard control house.

**Purchase and install the following relay equipment (Summary):**

- Purchase and install three (3) 230kV high accuracy extended range metering CT's for the Customer generator circuit line bay at Granger Switchyard. All metering will be bi-directional.
- Purchase and install four (4) 0.6% accuracy high capacitance 230kV CCVT's (3 on bus node and 1 on line node)
- Install shielded control cables.
- Purchase and install one (1) outdoor single-phase CCVT junction boxes.
- Purchase and install one (1) outdoor three-phase CT junction box (for Customer generator bay).
- Purchase and install one (1) outdoor three-phase CCVT junction box (for Customer generator bay).
- Purchase and install one (1) 28" line control panel.
- Purchase and install one (1) 28" breaker control panel.
- Purchase and install one (1) over-under voltage protection panel.

- Purchase and install one (1) metering panel.
- Purchase and install one (1) patch panel.

### **Relay Settings and Short Circuit Modeling**

#### **Relay Settings:**

- Entergy will observe and apply NERC/SERC Regulatory compliance FAC-009, PRC-001, and PRC-023 per requirements.
- Entergy will monitor internal compliance procedure for setting revisions, updates and EM obsolete relay replacement at Granger Switchyard.
- Develop new relay settings for one (1) Granger Station looking towards Generator PID 256 (Customer) per Entergy Standard PM1803, Option C2 for SEL421 and SEL311L.
- Develop new relay settings for one (1) breaker control panels with SEL451 per Entergy standard PM0501 Option B
- Develop new relay settings for one (1) over-under voltage protection panel
- Relay impact analysis and SPOF analysis will be done during PEP stage and scope may need to be modified as per the studies.
- Revise Granger – Pecan Grove (L-XXX) line relay settings at Granger Switchyard to address installation of the proposed new 230kV breaker.
- Entergy will provide off site/on site relay settings support during construction for setting database issues, relay software and firmware compatibility
- Entergy will perform setting logistics duties such as relay date base (.rdfs), relay viewable documents (.xls), project work folders for Web posting (WEBTOP), and relay modeling in ASPEN®.
- Entergy will complete relay settings corrections and issue new “as-built” settings based on returning “as-left” settings.

#### **Short Circuit Modeling:**

- Entergy will generate new LM records for all circuits associated with Granger Switchyard.
- Entergy will update the new Customer generator circuit design specs (Plans and Profiles forwarded by Entergy Transmission Line Design) into ASPEN.

#### **Communications and SCADA**

- Entergy will modify existing D400E RTU configuration to address the generator circuit addition at Granger Switchyard.
- Direct fiber relay communications will occur on Customer installed OPGW fiber installed along the generator circuit route. The fiber demarcation point will be located at a fiber splice box inside Granger

Switchyard. Entergy will splice ADSS fiber at this location to route communications inside the Granger Switchyard control house.

- Station communications with the Entergy SOC and TOC will occur on existing leased T1 TELCO circuit.

**Metering**

- Entergy will install, own and operate high accuracy four quadrant (Elite) meters for Customer generator revenue metering
- Entergy will install, own and operate high accuracy three element 230kV PT's and CT's for revenue metering at the Customer generator line terminal. All metering will be bi-directional.
- The generator meter tie at Granger Switchyard will be addressed as one interconnection, separate from the interconnection under the 20 MW Load Expansion Project.

**T-Line Work**

- No Entergy transmission line work scope is required to complete the proposed generator interconnection.
- The Customer will build, own and operate a 230kV generator circuit. The circuit will be approximately 0.6 miles in length and will connect the Customer generator step up transformer to Entergy's Granger Switchyard.

**5. COST**

The costs shown in the table include all applicable overheads but do not include tax gross up. Entergy incurs a tax liability proportional to the amount of Customer contributions.

**Estimated-Task-Costs**

<b>Task</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>Total</b>
Construct Interconnection Facilities at Granger Switchyard	\$0	\$716,241	\$89,201	\$805,442
<b>Total</b>	<b>\$0</b>	<b>\$716,241</b>	<b>\$89,201</b>	<b>\$805,442</b>

**6. UPGRADE CLASSIFICATION**

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

### Cost Analysis

Task	Total Cost	Base Plan	Supplemental	Reference
Construct Interconnection Facilities at Granger Switchyard	\$805,442		\$805,442	Section 4.1
<b>Total</b>	<b>\$805,442</b>		<b>\$804,442</b>	

## 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 3/8/2013. Based on an assumed Customer approval date of 01/30/2012, the following are approximate schedule dates:

Task Name	Estimated Start Date	Estimated ISD/Completion
Construct Interconnection Facilities at Granger Switchyard	Jan 2012	3/8/2013

The table above will be the Milestone dates for the LGIA Appendix B.

Notes to Duration Schedules:

- All construction work requiring outages will be performed during acceptable periods of system condition to ensure reliable operation of the system 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, an evolving system condition may result in cancellation of approved outages by the SOC/TOC and may also result in additional schedule delay.
- 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 non-typical adverse weather conditions.
- Schedule durations are high level estimates at this time. A detailed schedule will be prepared upon project approval.

## 8. INTERCONNECTION STANDARDS

The interconnection standards are detailed at the link shown below.

[http://entergy.com/energydelivery/facility\\_requirements.aspx](http://entergy.com/energydelivery/facility_requirements.aspx)

## 9. RISK ASSESSMENT

### Methodology

- Identify risk events that may occur during execution of the project.
- Analyze the impact (cost or schedule) of these risk events should they occur.
- Develop a risk response, involving the strategies of Accept, Mitigate, Transfer, or Avoid.
- Provide adequate contingency (cost or schedule) for those risks that will be Accepted or Mitigated.
- Identify the team member that will be responsible for tracking the contingency, and the estimated date that this contingency will either be utilized or eliminated.
- For the cost contingencies, implement tracking and utilization/draw-down within specific Work Orders in the Project Cost Sheet (e.g., TSxxxx construction contract contingency).
- For the schedule contingencies, include adequate float within specific Work Orders in the Project Schedule (i.e., between the Scheduled and Planned In-Service Dates).
- Where practical, include risk responses as individual tasks within the schedule.
- The Project Manager must authorize use of any cost or schedule contingency.

Risk	Comment	Impact
Construction of 20 MW Load Addition Project is delayed	Upgrades constructed for the load addition project, Granger substation, must be completed prior to installation of interconnection facilities for PID 256.	***
Material costs steel & Equipment	Rising steel, copper, fuel and other market conditions could affect estimated cost.	***
Scope based on design assumptions which may change	Varied impact on cost and schedule.	***

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

## 10. CONFIRMED RESERVATIONS

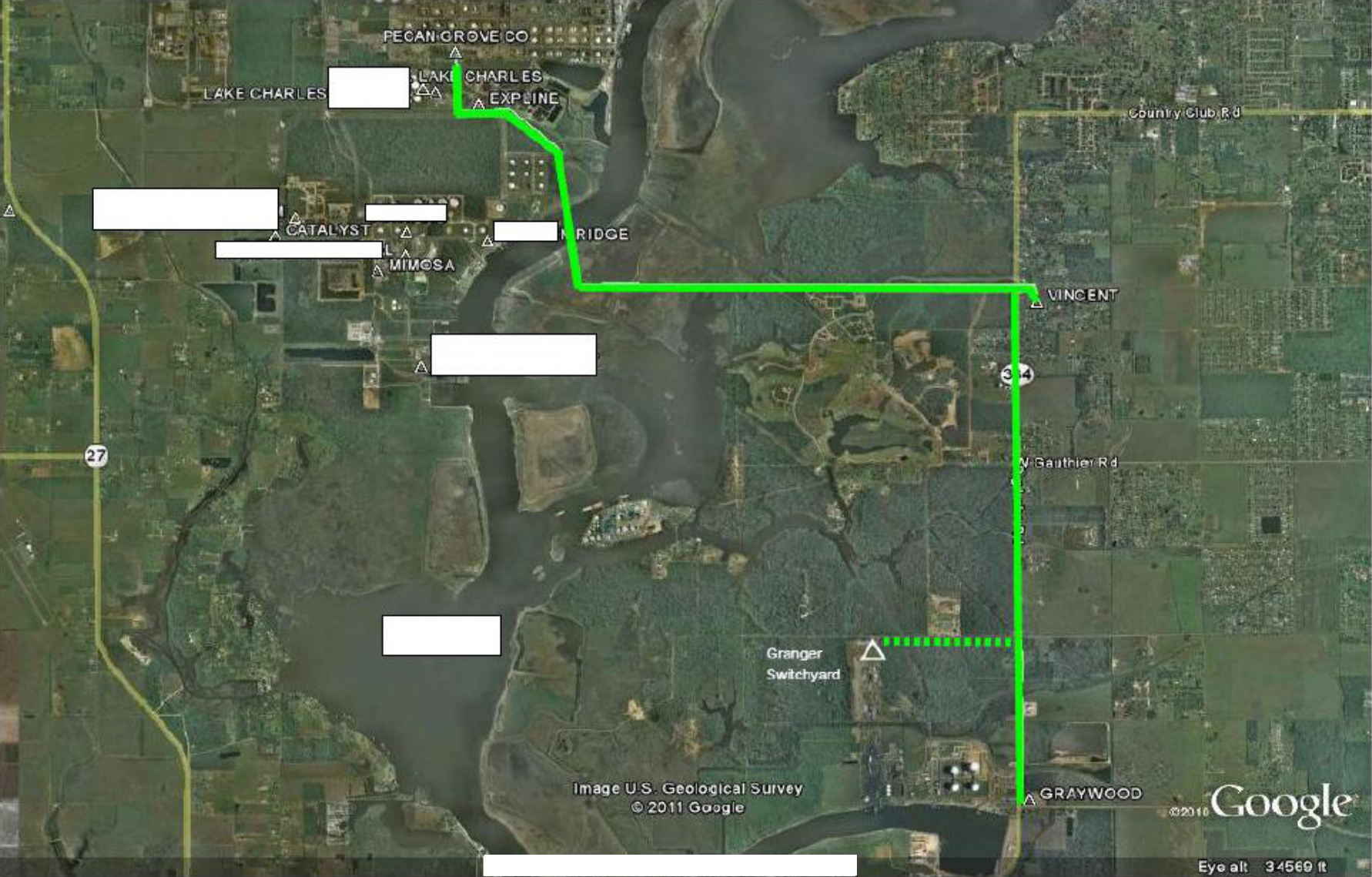
The following modifications were made to the base cases to reflect the latest information available:

- Approved transmission reliability upgrades for 2011 – 2013 were included in the base case. These upgrades can be found at Entergy’s OASIS web page, <http://www.oatiaoasis.com/EES/EESDocs/INFO.htm> under the Transmission Studies table link “ICT Planning Studies and Related Documents”.

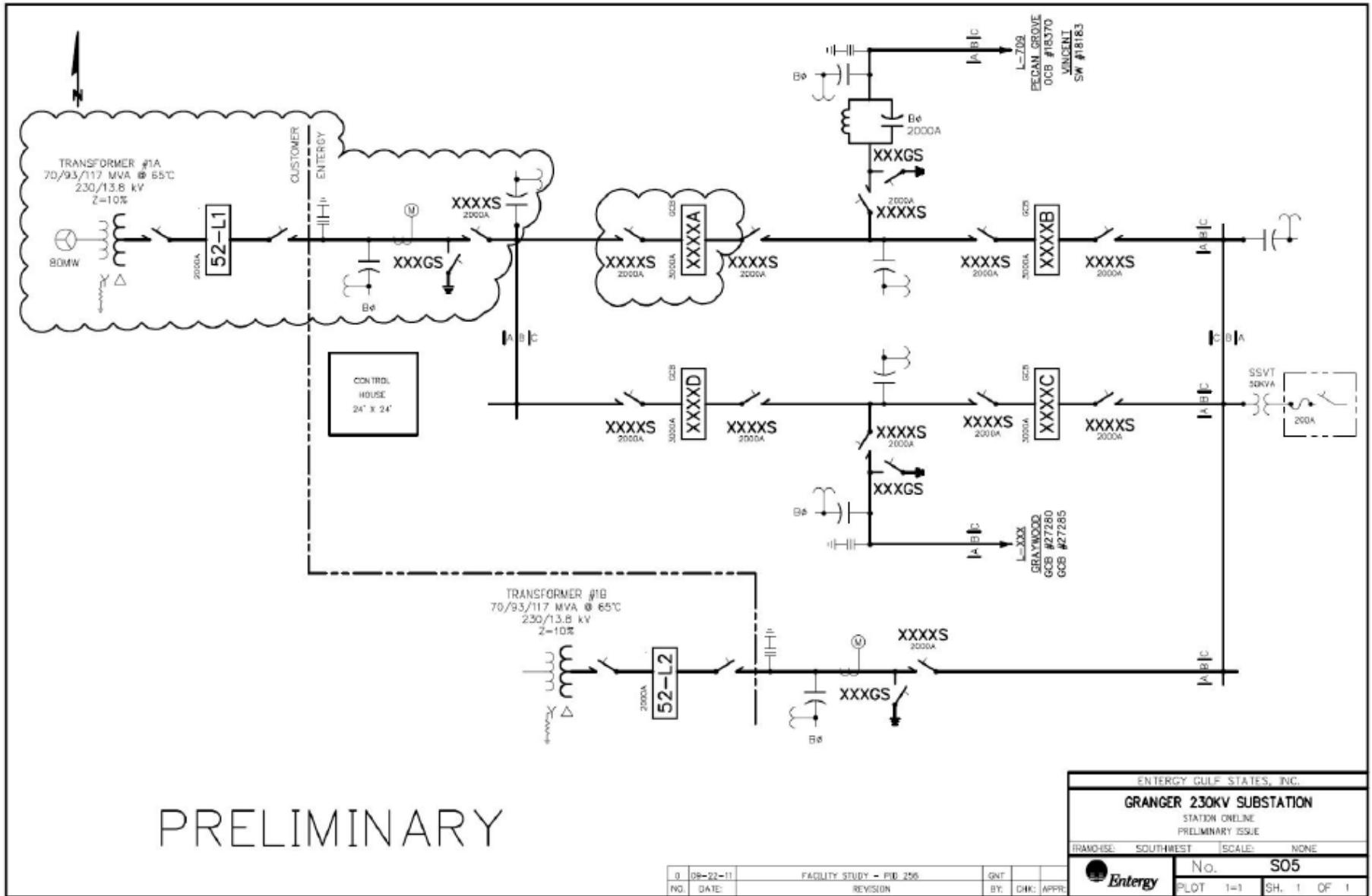
## 11. ATTACHMENTS

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**Attachment A – Area Map**

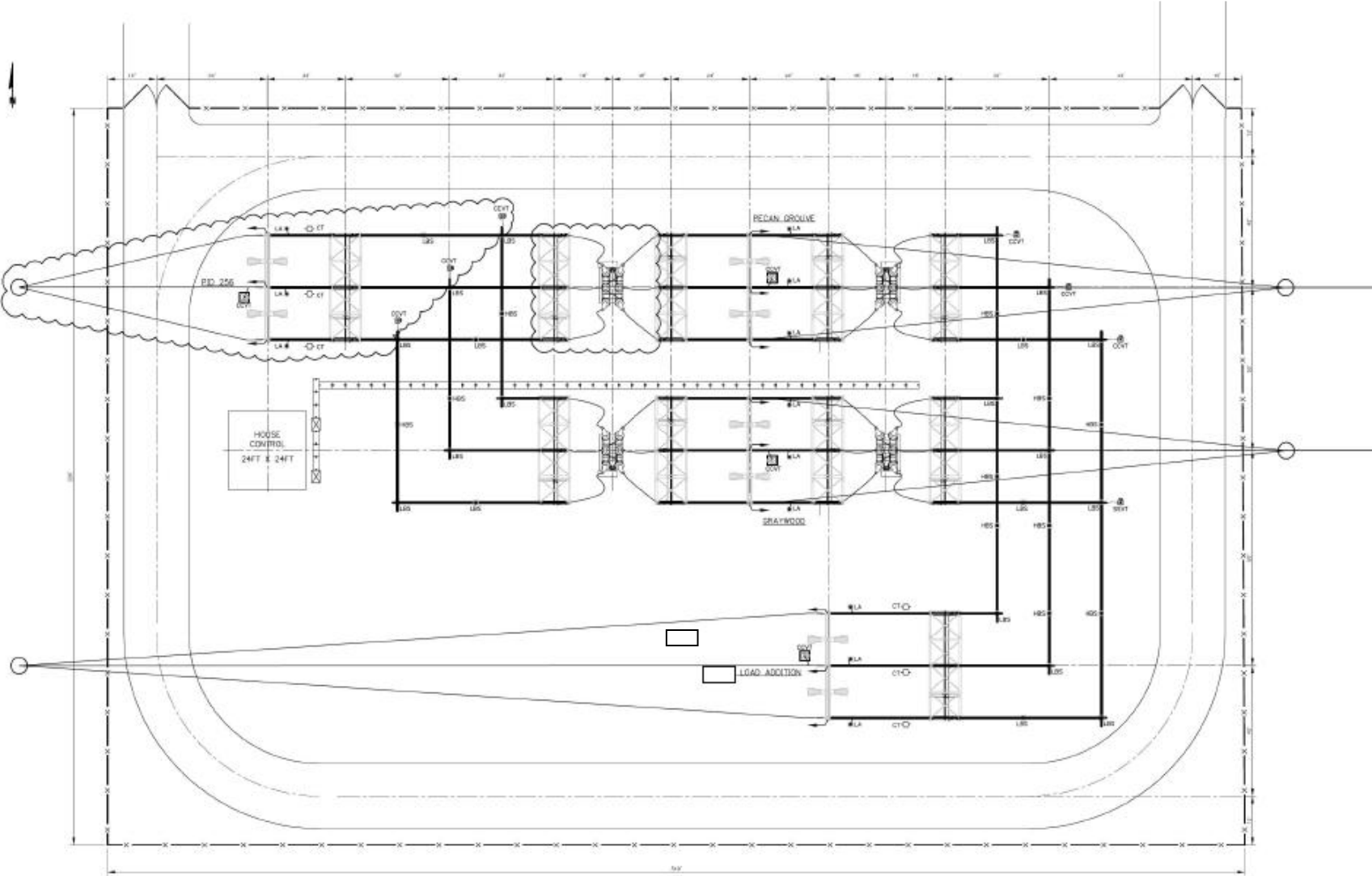


**Attachment B – Granger Substation S05 (Station Online)**





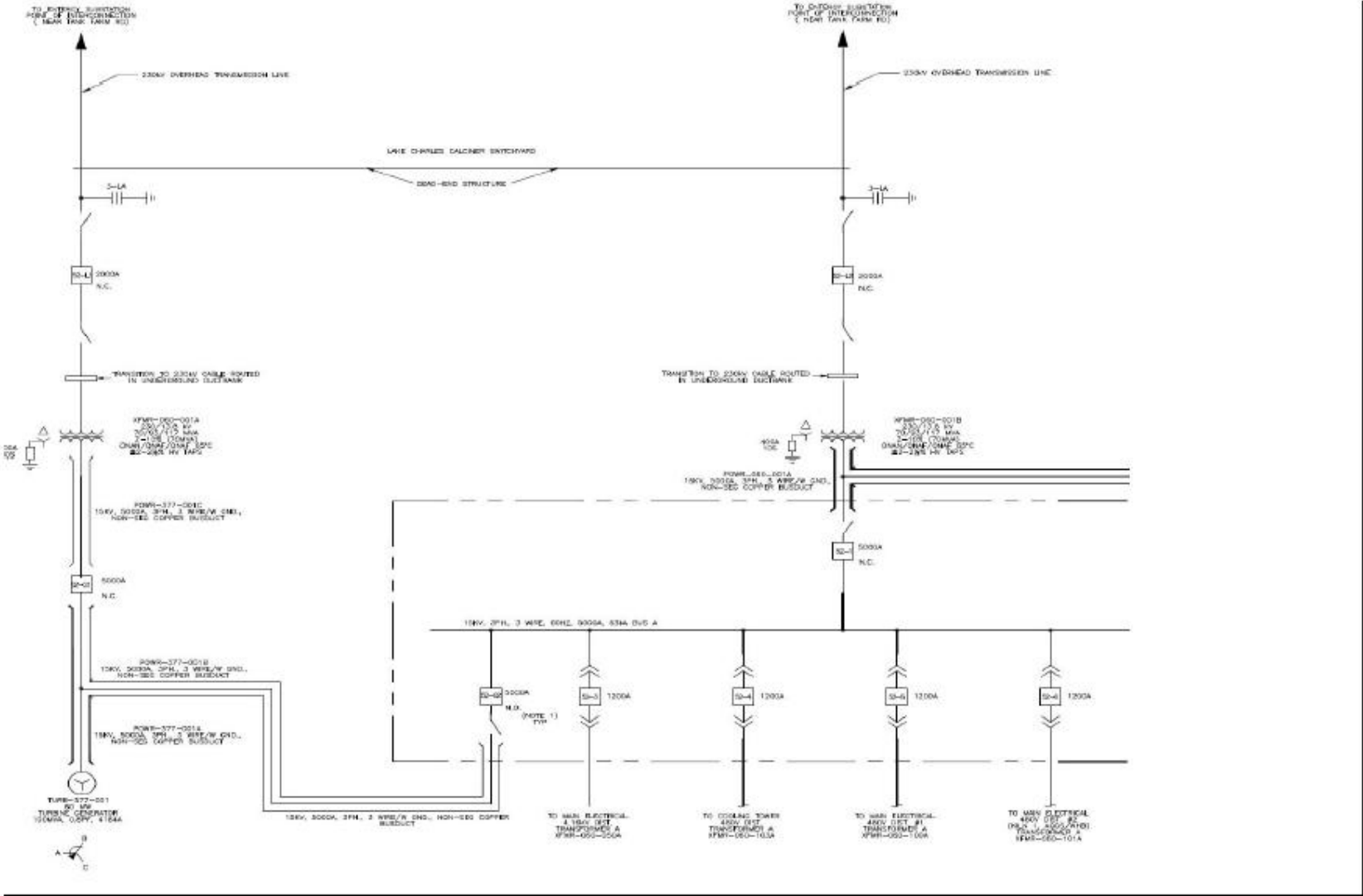
Attachment C – Granger Substation EA1 (Electrical Arrangement)



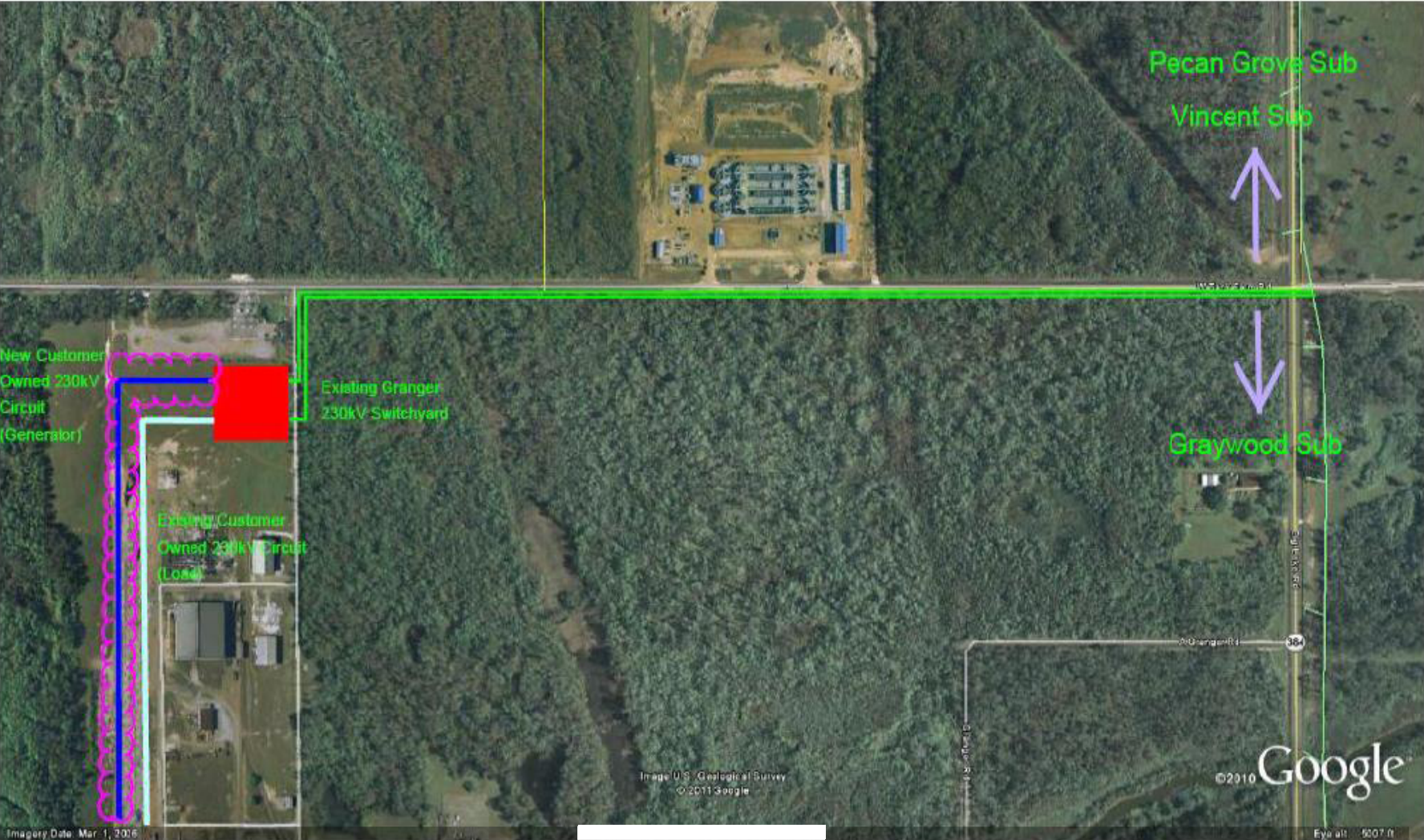
**Attachment D – Granger Substation EA1 Site Overview**



Attachment E – Customer Oneline



**Attachment F – Customer Generator Circuit Routing**



**Attachment H – Project Schedule Summary**

Generator Interconnection PID 256		PMC GGU Monthly Report			12-08-11 14:42	
Activity Name	Duration % Complete	Performance % Complete	Schedule % Complete	Start	Finish	
<b>Generator Interconnection PID 256</b>	13.15%	92.86%	98.02%	09-12-11 A	03-08-13	
<b>Scope Facility Study Template</b>	82.76%	92.86%	98.02%	09-12-11 A	12-16-11	
<b>INITIATION</b>	82.76%	92.86%	98.02%	09-12-11 A	12-16-11	
<b>Scope Definition Granger 230kV Switchyard Add Break</b>	0%	0%	0%	01-16-12	02-27-12	
<b>INITIATION</b>	0%	0%	0%	01-16-12	01-27-12	
<b>DEFINITION</b>	0%	0%	0%	01-30-12	02-27-12	
Site Visit	0%	0%	0%	01-30-12	02-03-12	
Issue Project Execution Plan	0%	0%	0%	02-06-12	02-10-12	
Obtain Project Funding Approval	0%	0%	0%	02-13-12	02-17-12	
Baseline Schedule / Gate Into Design & Construction	0%	0%	0%	02-20-12	02-27-12	
<b>Granger 230kV Switchyard Add Breaker and Metering</b>	0%	0%	0%	02-06-12	03-08-13	
<b>DESIGN</b>	0%	0%	0%	02-06-12	01-10-13	
Substation Design	0%	0%	0%	02-28-12	06-01-12	
Relay Design	0%	0%	0%	02-06-12	01-03-13	
Perform Work Order Maintenance	0%	0%	0%	03-29-12	06-26-12	
Material Procurement	0%	0%	0%	02-28-12	01-10-13	
<b>CONSTRUCTION</b>	0%	0%	0%	06-08-12	03-08-13	
Contractor Selection/Bid Period	0%	0%	0%	06-08-12	08-10-12	
Foundations	0%	0%	0%	10-15-12	11-09-12	
Steel and Electrical Equipment Installation	0%	0%	0%	11-12-12	12-18-12	
System Protection Construction	0%	0%	0%	01-14-13	03-08-13	
In Service Date	0%	0%	0%	03-07-13	03-08-13	

	Page 1 of 2	TASK filter: ETE Customer Report.
		(c) Primavera Systems, Inc.

**Attachment I - Table of Acronyms**

ACSR	Aluminum Conductor Steel Reinforced
ACSS	Aluminum Conductor Steel Supported
FUDC	Allowance for Funds Used During Construction
ATC	Available Transfer Capability
EES	Energy Control Area
EHV	Extra-High Voltage
ERIS	Energy Resource Interconnection Service
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
NRIS	Network Resource Interconnection Service
OASIS	Online Access and Same-time Information System
OATT	Open Access Transmission Tariff
POD	Point of Delivery
POR	Point of Receipt
SES	Steam Electric Station
SOC	System Operations Center
SHV	Super High Voltage
SW	Switch Station
TOC	Transmission Operations Center