



**TRANSMISSION LINE & SUBSTATION PROJECTS**

**COMPANY: ENTERGY LOUISIANA**

**CUSTOMER: PID 231**

**FACILITIES STUDY**

**EJO # F4PPLA0333**

**PID 231 GENERATOR INTERCONNECTION**

**Revision: 0**

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## 1. PROJECT SUMMARY

### 1.1 Background and Project Need

The purpose of this Facilities Study is to identify Entergy system requirements enabling 31 MW of generation to be connected to Entergy's transmission system at Good Hope Substation, via a 13.8/230kV step-up transformer.

A System Impact Study prepared by SPP ICT dated 11/20/09 indicated that the proposed generator connection will not adversely impact Entergy's system from a short circuit or stability point of view.

The Facilities Study has studied operational contingencies and determined relaying and operational requirement for customer to implement in order to safeguard Entergy system prior to connecting their generation to the Entergy system. It also identifies cost estimates incurred by Entergy and to be compensated by customer for work to be done prior to commissioning of the generating unit.

### 1.2 Scope Summary

The purpose of this study is to identify scope requirements and costs associated with establishing means to connect customer's 31 MW of generation to Entergy system.

At the customer's request, Entergy has already studied Entergy requirements and work associated with the customer's planned rebuild of Good Hope Substation in order to serve their projected plant load increases/shifts as well as their generator interconnection.

Entergy's scope of work includes oversight and commissioning support for the customer's rebuild of Good Hope Substation, relocation of 230kV transmission lines at Good Hope, and modifications to line relaying at Prospect 230kV Substation.

It is not known at this time if Entergy or the customer will own the high side through-bus at the conclusion of the project. If Entergy owns the high side through-bus, then TGU will apply to it at the time of the transfer. The cost projected in this estimate does not include TGU associated with the transfer of the high side through bus. If the high side bus transfer occurs there will be an additional TGU payment required based on the value of the asset transferred.

The attached one-line shows Entergy owning the high side through-bus. If the customer owns the high side through-bus, then this configuration will change.

### **1.3 Cost Summary**

- The estimated total project cost is \$2,200,000.00. This cost does not include AFUDC but does include TGU associated with oversight, commissioning, and the transmission line work at Good Hope.

### **1.4 Schedule Summary**

- The customer has proposed completing construction and commissioning of the new 230kV through-bus bays at Good Hope Substation by January 2011. This supports the customer's proposed in-service date for the generator of February 2011.

## **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 Facilities Study be approved, Entergy's participation would generally adhere to the motto described above and reflect in their finished product and expect the same from the applicant in their product.

## **3. GENERAL ASSUMPTIONS**

- All costs above represent good faith estimates in 2010 dollars. Price escalation for work in future years has not been included.
- Customer is required to provide generator as-commissioned parameters (impedances, time constants, etc) to Entergy Planning department after the units are tested and connected to the system.
- Customer will need to meet Entergy Specifications including SL0002 Customer Built Substations, MP3901 Generation Interconnection Requirements, and MI0301 Transmission Metering Application Standards.
- Automatic generator control is not applicable.

## 4. SCOPE OF WORK

### 4.1 Background and Concerns

It is understood that the customer will connect 31 MW of generation to the existing 230kV bus at Good Hope 230kV Substation. Refer to the attached one line diagram in Section 8. 230kV lines are terminated on breakers at Good Hope Substation, and are terminated at Prospect and Destrehan Substations. In order to serve both their proposed generator interconnection and their planned increase/shift in plant electrical loads, the customer intends to rebuild/expand Good Hope Substation, including two new bays for the 230kV through-bus, a new bay for their generator step-up transformer, and new bays for their existing/new power transformers.

### 4.2 The proposed Entergy scope of work includes:

#### 4.2.1 Good Hope 230kV Substation

- Provide oversight and commissioning support for the customer's rebuild and expansion of the 230kV station, particularly for the new through-bus bays and associated relaying and communications. Refer to the attached one-line diagram showing the proposed final station configuration.
- Develop and implement the necessary relay settings and RTU configuration associated with the new/modified 230kV facilities.
- Install and commission revenue meters for all new/existing 230/13.8kV transformers (one generator step-up and four load transformers, all metered at the high-side bushings).

#### 4.2.2 Prospect 230kV Substation

- Upgrade the Good Hope line relaying as needed to support the work described in 4.2.1.

#### 4.2.3 Prospect-Good Hope-Destrehan 230kV Transmission Lines

- Relocate the existing line cut-ins to the new through-bus bays at Good Hope, and remove shield wires that extend over the substation bays.

## 5. 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, except for AFUDC since the customer is already committed to pre-paying. The costs also include tax gross up, at the current rate for ELL of 28.41%. The cost projected in this estimate does not include TGU associated with the transfer of the high side through-bus. Entergy incurs a tax liability proportional to the amount of customer contributions. Indirect cost and tax gross up rates are subject to change. The costs shown are considered to be accurate to within +/-20%.

**Cost Analysis**

Description	TOTAL including indirects	Base Plan	Supplemental	Reference
Good Hope & Prospect Substation modifications & Transmission Line Cut ins	\$2,200,000		\$2,200,000	4.2
<b>TOTAL</b>	<b>\$2,200,000</b>		<b>\$2,200,000</b>	

**6. SCHEDULE**

- The customer has proposed completing construction and commissioning of the new 230kV through-bus bays at Good Hope Substation by January 2011, and then connecting their new generator to the 230kV bus by February 2011.
- The above date is contingent upon the customer completing all pre-outage construction approximately one month prior to starting the 230kV line outages. These line outages should take into consideration the requirement to schedule the outages several months in advance, the need to obtain approval from the SOC and TOC, and the possibility of the outages being subject to disapproval or cancellation due to seasonal loads and/or unfavorable system conditions.

**7. RISK ASSESSMENT**

The line upgrades are dependent on obtaining outages for the line work. If outages cannot be obtained or must be sequenced due to seasonal requirements, additional time will be required to complete the upgrades.

**8. ATTACHMENTS**

- A. One line drawing

