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1. PROJECT SUMMARY

1.1. Background and Project Need

The purpose of this Facilities Study is to specify and estimate the cost of the equipment, engineering, procurement and construction work needed to physically and electrically connect the Small Generating Facility with Entergy's Transmission System in accordance with Good Utility Practice. PID 258 is an existing generator connected at Rice Substation.

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 & construction of the identified projects.

3. GENERAL ASSUMPTIONS

- Information relating to relaying data owned by the customer reflects what exists and is operational at the customer facility.
- Customer will maintain relay and communication equipment relating to Entergy system as per manufacturer's recommended schedule and contractual agreement with Entergy
- Customer will make necessary changes as and when changes at their premise are made. In addition, should Entergy system configuration be modified, customer will revise relaying, communication, metering, or RTU configuration as required.

4. SCOPE OF WORK

4.1. Rice 69 KV customer owned Substation

(Situated in Entergy Gulf State)

General:

Customer owns generation that is connected to Entergy Transmission system via 12/13.4 MVA, 67/13.8 kV, star/delta connected transformer. One 69 kV breaker numbered 18400 is connected between the node of transformer 69 kV and Entergy Transmission Lines to Smith and Chlomal. Customer has installed and operated relaying system to protect transmission lines and the generator by tripping breaker 18400 for line faults. A bidirectional revenue meter is also in service. It is not known if breaker 18400 has a failed breaker relaying to isolate the generator from line fault.

Relaying to protect Entergy transmission lines:

Relay setting group of Entergy has performed analysis of relays at Rice SS to determine relaying capability at Rice Substation owned and operated by the customer to be

adequate in protecting line faults. This is with the assumption that relays are functional, being maintained as per manufacturer's recommendations, and the settings as known to Entergy (see attached file) are applied on relays. Also, it is assumed that as the relays expected age expires, they will be replaced with latest technology in consultation with Entergy.

Record of relaying does not indicate failed breaker protection for 18400. Should this breaker fail to open for transmission line fault, in the interest of protecting generator, it is expected that customer has devised means to detect failed breaker feeding line fault current and isolate the generator by tripping a low side generator breaker or by tripping turbine. Customer is recommended to take this into consideration.

Future connection on lines connecting Rice Substation:

The study was based on the current system configuration. Relay protection requirements would need to be reviewed if a new substation is installed on the lines between Chlomal substation and Smith substation. Should a new substation be installed between Chlomal substation and Smith Substation, Entergy may require the installation of a transfer trip scheme or other protective devices. PID 258 would be responsible for any costs associated with upgrades of protection equipment, if and when needed.

Revenue Metering:

It is confirmed through Entergy metering department that the revenue class meter is bidirectional and no changes are required

Communication to SOC and DOC:

Manual disconnect switches 18399, 18401, 18428 and breaker 18400 are not controlled from DOC. These are graphically displayed at DOC and during switching, manual tags are applied to show them being out of service under an outage order. It is understood that this was agreed between the PID 258 and Entergy as part of the switching and tagging agreement. If one does not exist, it should be implemented.

A dedicated phone line to Pine Bluff, Arkansas System Operations Center (SOC) is in place and the breaker status (18400) along with the meter data (kV, kW, KVAR, KWhr, KVARhr) is being transmitted.

5. COST

No upgrades were identified. Therefore, no costs have been provided for upgrades. .

6. ATTACHMENTS

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 |
| 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 |

Relay data:



Customer relay
data.pdf

One line diagram:



Rice SS.dwf

Customer Relay Data

REVISD
CURVES REV.
TEST DATA
DATA FILE

LC. 8405715
PAGE 1 OF 1

GULF STATES UTILITIES COMPANY
RELAY SETTING CHANGE

DATE 07-26-94 NO. LC-87-05-099
LOCATION RICE CO-GEN BREAKER NO. 18400
CIRCUIT 69KV MAIN TIE-LINE TO CUST'S 69/13.8 XFMR & 12.5MVA GEN
CT RATIO 200/5 PT RATIO 600/1

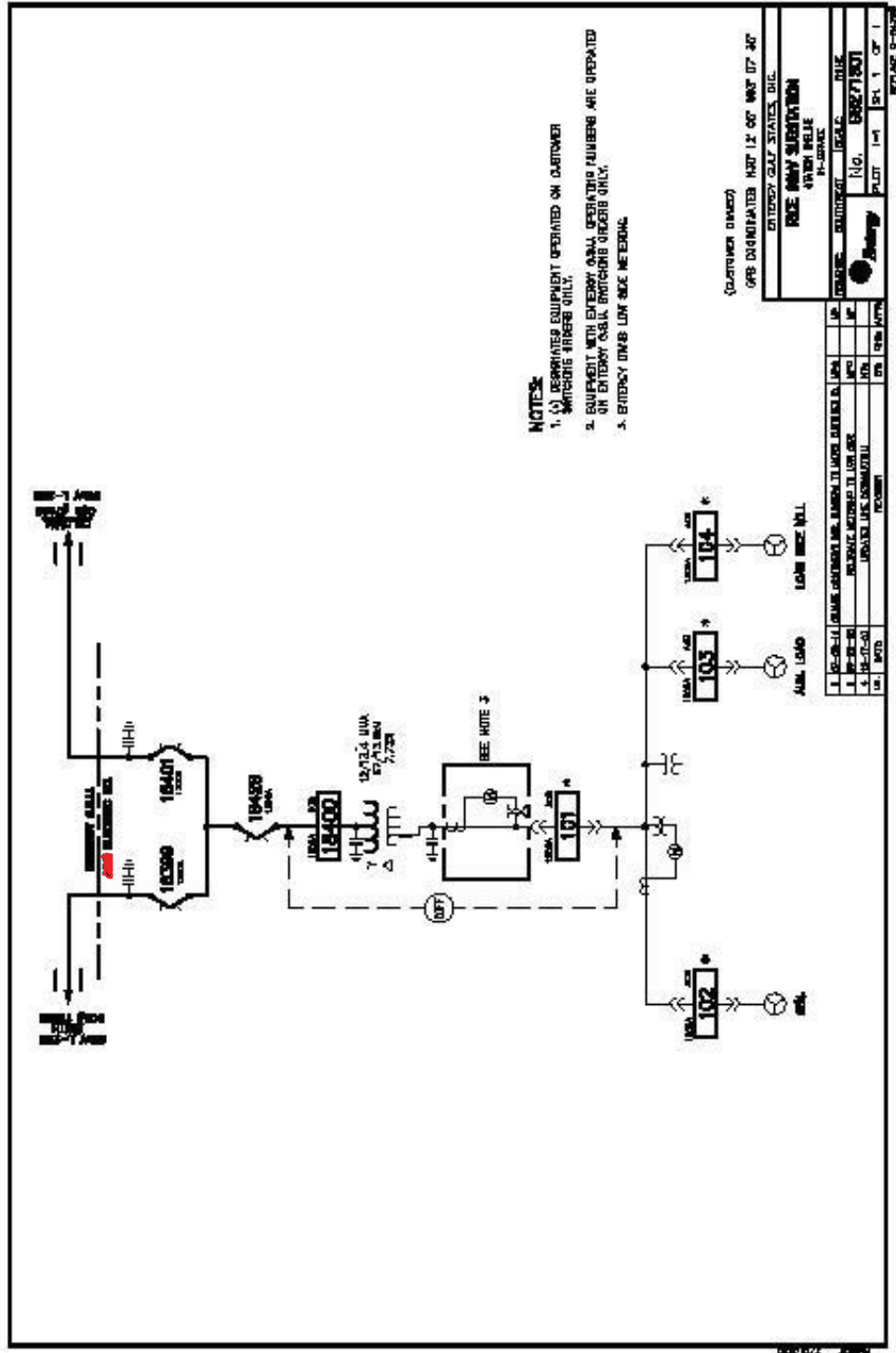
RELAYS ON THIS EQUIPMENT ARE TO BE SET AS INDICATED BELOW-

| TYPE & USE | STYLE NO. | RANGE | SETTING |
|-------------------------------|-------------|--------------------|--|
| IFC-51 PH O C LC-87-05-099 | 12IFC51001A | 1-12 A 6-150 IT | 3 A 2 T, 120 A PU 10 A SEC, 400 A PRI |
| IFC-51 ORD LC-85-09-184 | 12IFC51A02A | .5-4 A | 1 A 3 T, 40 A PU |

COMMENTS-
PHASE & GRND RELAYS TRIP DCB #18400.
RAISE PHASE & GROUND TIME LEVER SETTINGS FOR BETTER COORD-
INATION.

COORDINATION CURVE NO. - RECOMMENDED 07-26-94
 LC-69, LC-405, LC-405A, LC-406, LC-503, LC-868, LC-869, LC-87D
 APPROVED 07-26-94
 LAST CHANGE NO. - LC-85-12-233 EXECUTED
 NOTED
 *** PLEASE CHECK STYLE NUMBERS *** RECORDED

Rice Substation One Line Diagram



10/21/2010 10:28:29 AM: s:\projects\271807\dwg\271807-1001.dwg, 71120110 10:28:29 AM: s:\projects\271807