



TRANSMISSION LINE & SUBSTATION PROJECTS

COMPANY: ENTERGY SERVICES, INC.

CUSTOMER: PID 240

FACILITIES STUDY

EJO NO. F4PPAR0479

GENERATOR INTERCONNECTION STUDY

PID 240

Revision:

1

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1. PROJECT SUMMARY

1.1. Background and Project Need

The purpose of this Facilities Study is to determine the necessary upgrades on Entergy Transmission system to change the status of PID 240 from ERIS to NRIS. PID 240 owns 650 MW of generation and is presently connected to the Entergy transmission system at Malvern, AR. The customer has requested a $\pm 20\%$ 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 summer peak cases, using PSS/E and MUST software by Power Technologies Incorporated (PTI). The Facilities Study will identify the transmission interconnection requirements and any transmission constraints resulting from the change in status and also includes cost estimates to correct any transmission constraints. The requested in-service date is October 1, 2010.

The analysis indicated the customer will not be required to purchase any financial rights. Entergy has identified the following constraints that were developed with the NRIS study and are required for the interconnection.

1.1.1 New Twinkletown-Church Road-Getwell 230kV transmission line (Situating in Mississippi)

The Horn Lake-TH Allen 161kV transmission line overloads for the loss of the Horn Lake-Freeport 230kV transmission line. The construction of a new 230kV transmission line from Twinkletown-Church Road-Getwell will eliminate this constraint.

The new Twinkletown-Church Road 230kV transmission line has been approved in the 2011-2013 Entergy Construction Plan and has an expected in-service date of 2012.

The Church Road-Getwell 230kV transmission line has been proposed in the 2011-2013 Entergy Construction Plan and has an expected in-service date of 2013.

1.1.2 Approved projects in the 2011-2013 Entergy Construction Plan

The following projects are required to be in-service prior to the start of NRIS status:

- McAdams 500/230kV 2nd Auto: 2011 Expected ISD
- Holland Bottoms Phase 1: 2011 Expected ISD
- Holland Bottoms Phase 2: 2012 Expected ISD
- Holland Bottoms-Hamlet 161kV new line: 2012 Expected ISD
- Twinkletown – Church Road 230kV transmission line: 2012 Expected ISD

1.1.3 Proposed projects in the 2011-2013 Entergy Construction Plan

The following project is included in the 2011-2013 Entergy Construction Plan as Proposed & In Target and is required to be in-service prior to the start of NRIS status:

- Church Road – Getwell 230kV transmission line: 2013 Expected ISD

1.2. Customer Facilities

Considering that it is an existing generation, no customer facility is identified in this study.

1.3. Scope Summary

- No physical work is required for interconnection; however upgrades as described below are required.
- Construction of new 230kV line connecting Twinkle Town-Church Road-Getwell in Mississippi.

1.4. Impact

- The estimated total project cost is \$15,000,000 Full Financial. This cost does not include Tax Gross Up which may apply.
- The ICT has assigned \$15,000,000 as Base Plan based on Attachment “T” of Entergy’s ICT (Independent Coordinator of Transmission) filing to the FERC.

1.5. Schedule Summary

Based on plans underway by Entergy, the estimated completion date of the project is December 2013. Estimate work order completions are shown in the table below.

WO Name	Requested ISD	Estimated ISD
New line between Church Road and Twinkle Town	10/1/2010	12/31/2011
New line between Church Road and Getwell	10/1/2010	12/31/2013

Note that the in-service dates (ISDs) are based on a preliminary, un-baselined project schedule. The dates may vary based on potential changes in schedule assumptions such as timing of funding authorizations, outage approvals, ROW/permitting, land acquisition matters, etc.

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.

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

3. GENERAL ASSUMPTIONS

- All costs above represent good faith estimates in today's dollars. Price escalation for work in future years has not been included.

4. SCOPE OF WORK

4.1. New Twinkletown-Church Road 230kV transmission line

The construction of this line and upgrade at substations is being undertaken by Entergy for an expected completion date of December 2011. Therefore, scope details and estimates are not being reported.

4.2. New Church Road-Getwell 230kV transmission line

4.2.1 General

This project is being developed by Entergy and is in preliminary stages of scoping and estimate. Planned completion date is June 2013. The following is taken from Project Scoping Plan recently completed and should be considered good faith based on the judgment of experienced professionals without hard data. Detailed work on scope and estimates will commence in the near future.

The scope of this project is to build a new 230kV line from Getwell to Church Road (estimated 11 miles) with a rating of least 500MVA. Once this line is in service, the 230/161kV auto transformer at Horn Lake can be closed in without any additional overloads. Some ROW is already owned in this area, but not the complete route.

At Church Road structures #75-79 will be double-circuit with Twinkletown-Church Road 230kV line. Consider installing dead-ends outside Church Road during construction of Twinkletown-Church Road line.

4.2.2 Substations

Getwell Substation

Site/Electrical:

Add one new 230kV bay on west side of station. The new line will exit the station to the North.

Minimal grading is required

Relaying:

One new line panel and a breaker panel are required. Evaluate existing battery & RTU capacity and available space in control house. Relay communications will be fiber.

Construction:

Bus and Line outage will be required

Church Road Substation

Site/Electrical:

Add one new 230kV bay on north side of station. This line will exit the station to the west turning south down Tulane road to become double-circuit with the Twinkletown-Church Road line for several structures. Minimal grading is required.

Relaying:

Assumed - new station to be built prior to this project. Need to verify RTU capacity, batteries, etc. Church Road fiber is planned to be used for voice communication.

Twinkletown Substation

Twinkletown Substation is connected to the Fiber Backbone. The overall scheme is to connect Getwell to the Fiber Backbone via the new line coming from Twinkletown. This will allow digital protection from Getwell to Twinkletown and Getwell to Horn Lake. To accomplish this Communication equipment will need to be installed at Getwell. The existing panels at Twinkletown are digital (Primary & Backup) and last year's (2009) standard. The new standard has a dual scheme (Primary1 & Primary2).

4.2.3 Settings

Getwell

Settings will be required for line protection

Church Road

No relaying at Church Road

Twinkletown

New Settings, and new line panel will be required when Church Road Getwell line is built.

Review fiber communication plan from Telecommunications to determine impact on other stations. Relay impact study to verify other equipment requirements. Evaluate fault current impacts.

4.2.4 RTU configurations

Revise alarm and status at all three substations as required.

4.2.5 Right of Way

Some ROW is owned in this area (3.3 miles ROW owned out of a ~11 mile assumed route). Assume t-line will follow Tulane Road, but new ROW requirements will depend on final route selected. Consider a route study if a new route is required.

4.2.6 Permits

Highway crossing permit required for I-55. Need to determine future route of I-69 and if additional Hwy crossing permit is required (now or in future).

A CCN was acquired for Getwell-Arkabutla in 2004. A second CCN was acquired for Church Road-Getwell as part of the CCN to build Twinkletown-Church Road line.

Normal environmental assessments will be required for t-line and substation site work as required.

5. COST

The ICT has reviewed and determined that each required upgrade will be considered either 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 all applicable overheads but do not include tax gross up. Entergy incurs a tax liability proportional to the amount of customer contributions; therefore, tax gross up may be applied to the customer’s costs. The current TGU rate in Entergy Arkansas is 27.35% and is subject to change.

Cost Analysis

Description	Previous	2011	2012	2013	Total
Church Road-Twinkle Town 230kV (MS) ⁺	--	--	--	--	N/A
Church Road-Getwell 230kV (MS) [*]	\$1,237,000	\$2,871,000	\$5,949,000	\$4,943,000	\$15,000,000
McAdams 500/230kV 2 nd Auto ⁺	--	--	--	--	N/A
Holland Bottoms Phase 1 ⁺	--	--	--	--	N/A
Holland Bottoms Phase 2 ⁺	--	--	--	--	N/A
Holland Bottoms-Hamlet 161kV new line ⁺	--	--	--	--	N/A
Total	\$1,237,000	\$2,871,000	\$5,949,000	\$4,943,000	\$15,000,000

+Approved 2011-2013 Entergy Construction Plan project

*Proposed 2011-2013 Entergy Construction Plan project

6. UPGRADE CLASSIFICATION

The ICT has reviewed and determined that 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.

Description	Total Cost	Base Plan	Supplemental	Reference
Church Road-Twinkle Town 230kV (MS) ⁺	--	--	--	Section 1.1.1
Church Road-Getwell 230kV (MS)	\$15,000,000	\$15,000,000	--	Section 1.1.1
McAdams 500/230kV 2 nd Auto ⁺	--	--	--	Section 1.1.2
Holland Bottoms Phase 1 ⁺	--	--	--	Section 1.1.2
Holland Bottoms Phase 2 ⁺	--	--	--	Section 1.1.2
Holland Bottoms-Hamlet 161kV new line ⁺	--	--	--	Section 1.1.2
Total	\$15,000,000	\$15,000,000	--	

+Approved 2010-2012 Entergy Construction Plan project

*Proposed 2010-2012 Entergy Construction Plan project

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 December 2013. This is based on Entergy plans underway for Church Road – Getwell project:

Description	Estimated Start Date	Estimated ISD/Completion
Church Road-Twinkle Town 230kV (MS)	Underway	December 2011
Church Road-Getwell 230kV (MS)	Initiated	December 2013
McAdams 500/230kV 2 nd Auto ⁺	Underway	December 2011
Holland Bottoms Phase 1 ⁺	Underway	December 2011
Holland Bottoms Phase 2 ⁺	Underway	December 2012
Holland Bottoms-Hamlet 161kV new line ⁺	Underway	December 2012

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

Notes to Duration Schedules:

- The above dates are borrowed from Entergy schedules and are dependent on securing of easements for the ROW, permits, availability of outages, weather condition, labor market, etc and any of this could affect adversely and change the date of completion.

8. INTERCONNECTION STANDARDS

N/A

9. RISK ASSESSMENT

Risk	Comment	Impact
Weather, labor and other unknown issues could result in delay in completion of projects being undertaken by Entergy	Every effort is being made to ensure all projects are being managed to complete before the end of 2013	***

*-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:

- Confirmed firm transmission reservations were modeled.
- 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.oatioasis.com/EES/>, under ICT Planning Studies and Related Documents.

Prior generator interconnection NRIS requests that were included in this study:

PID	Substation	MW	In-Service Date
PID 221	Wolf Creek	875	In-Service
PID 223	PID-223 Tap	125	10/1/2010
PID 224	PID-224 Tap	100	12/1/2009
PID 228	PID-228 Tap	115	4/30/2011
PID 233	PID-233	150	12/31/2013
PID 238	PID-238	550	9/1/2010

Prior transmission service requests that were included in this study:

OASIS #	PSE	MW	Begin	End
1668165	Entergy Services (SPO)	600	1/1/2013	1/1/2043

11. ATTACHMENTS

11.1 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