TRANSMISSION LINE & SUBSTATION PROJECTS

COMPANY:EMI

CUSTOMER: PID 238

FACILITIES STUDY

PID 238 GENERATOR INTERCONNECTION

Revision:
2

Rev	Issue Date	Description of Revision	Prepared By	Approved By
A	6/28/10	Shell for team input	IK	CN
B	8/30/10	Submitted to TPD	IK	CN
C	10/13/10	Submitted for management approval	RB	BW
1	10/29/10	ICT Review and Classification	BEF	BLR
2A	01/05/11	Revised per solution set rev 4 11-29-10	IK	CN
2B	01/21/11	Revised including JET comments	IK	CN
2C	01/26/11	TPD Approval	RB	BW
2	2/17/11	ICT Review and Classification	EC	RB

TABLE OF CONTENTS

1. PROJECT SUMMARY

1.1 Background and Project Need

The purpose of this Facilities Study is to identify the requirements necessary to change from ERIS to NRIS status. The study evaluates connection of 550 MW of generation to Entergy Transmission system. The proposed in-service date for NRIS is September 1, 2010.

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.

A review of the data provided has been completed regarding the reactive power output. It has been concluded that these units are capable of meeting the 0.95 lagging reactive power requirement and no additional reactive power devices are required for this request.

To evaluate this request, the study was performed with the latest available summer peak cases, using PSS/E and MUST software by Power Technologies Incorporated (PTI).

Entergy has identified the following constraints that were developed with the NRIS study and are required for the interconnection:

1.1.1 The following projects are approved in the 2011-2013 Entergy Construction Plan. These projects are required to be in-service prior to the start of this transmission service.

- Florence - Florence SS - Star 115kV line upgrade: 2011 Expected ISD
- Ray Braswell – Wynndale 115kV new line: 2013 Expected ISD
- Loblolly-Hammond 230kV new line: 2012 Expected ISD
- Ridgeland-Madison Reliability Improvement: 2012 Expected ISD
- Sterlington 3rd 500/115kV Autotransformer and split bus: 2012 Expected ISD

1.1.2 Upgrade Rex Brown-Jackson Miami 115kV transmission line (1.76 miles).

The Rex Brown-Jackson Miami 115kV transmission line overloads for the loss of the S. Jackson 230/115kV autotransformer. It is required that the Rex Brown-Jackson Miami 115kV transmission line be upgraded from a capacity of 320MVA to at least 336MVA.

The proposed rating of the upgraded line is 390MVA. The amount of capacity created by this upgrade is 70MW, and the customer's use of the capacity created is 9MW.

1.1.3 Re-energize the idle Danville-Winnfield 34.5kV line to 115kV line and convert the existing Danville-Winnfield 115kV line to 230kV operation.

The Sterlington-Downsville 115kV transmission line overloads for the loss of the Sterlington-El Dorado 500kV transmission line. This constraint is alleviated by re-energizing the idle Danville-Winnfield 34.5kV line to 115kV and converting the existing Danville-Winnfield 115kV line to 230kV operation.

The proposed rating of the converted Danville-Winnfield 230kV line is 351MVA. The amount of capacity created by this upgrade is 351MW, and the customer's use of the capacity created is 2MW.

1.1.4 Financial Rights for Supplemental Upgrades

The following supplemental upgrades are impacted by this NRIS request by the specified MW amount.

- S. Jackson-Florence 115kV – 20 MW Impact
  - Estimated Unit Rate - $95,874/MW
  - Related Facilities Study – ASA-2008-001

- Sterlington 3rd 500/115kV Autotransformer – 31 MW Impact
  - Estimated Unit Rate - $13,761/MW
  - Related Facilities Study – OASIS #1478781

1.1.5 CLECO Affected System Study

Due to the near proximity of the above-mentioned required upgrade 1.1.3 to CLECO's control area, CLECO has been identified as an affected system. The customer will need to satisfy the requirements deemed necessary by CLECO.

1.2 Scope Summary for NRIS

Interconnection of generator is existing and no work has been identified Upgrades required for interconnection include the following:

- Item 1.1.1 – All projects are being undertaken by Entergy.

- Item 1.1.2 - Upgrade Rex Brown to Miami 115kV line from 320MVA to 336MVA (1687A).

- Item 1.1.3 – Re-energize the idle Danville-Winnfield 34.5kV line to 115kV and converting the existing Danville-Winnfield 115kV line to 230kV operation.

- Item 1.1.4 – No work is required

1.3 Cost summary

- The estimated total project cost is $14,363,106 Full Financial. This cost does not include Tax Gross Up which may apply.

- The ICT has assigned $12,019,035 as Supplemental Upgrades based on Attachment “T” of Entergy’s OATT. As described in Section 1.1.4 above, $2,344,071 in financial rights payments will required to the customer(s) funding supplemental upgrades that were impacted by this generation interconnection request.

1.4 Schedule Summary

Based on an assumed start date of July 2011 the estimated completion date of the project is April 2014. Estimate work order completions are shown in the table below.

WO Name	Requested ISD	Estimated ISD
Rex Brown Substation	09/2010	April 2013
Miami Substation	09/2010	April 2013
Rex Brown – Miami line	09/2010	April 2014
Danville to Winnfield line	09/2010	April 2014
Danville SS	09/2010	April 2014
Winnfield SS	09/2010	April 2014

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

1.5 Long Lead and Major Material / Equipment

See each line and Substation section for long lead delivery items

2. SAFETY

Safety is a core value at 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 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

- Upon receipt of formal approval from customer authorizing design and construction, Entergy will prepare a detailed project execution plan.
- All permits will be attainable in a reasonable period.
- Due to timing and/or funding constraints, topographic 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.

4. SCOPE OF WORK

4.1 Entergy projects as described in section 1.1.1

The four projects as outlined in section 1.1.1 are being undertaken by Entergy and their schedule for completion is as described in this section.

4.2 Upgrade Rex Brown to Jackson Miami 115kV line (Mississippi)

General: Approximately 1.76 miles of 115kV existing line is required to be upgraded to 336MVA. This line will then deliver 390MVA (1958A) based on the use of 1272 ACSS.

It is assumed that an outage would be granted to replace the conductors and it will be done on the existing right of way using new conductor size. Some poles may be required to be replaced.

ROW: No new ROW is required

Environmental Permitting: Storm water management plan and wetland permits as required.

Structures and foundations: Line was rebuilt in the year 2000. It is assumed that the existing structures will be adequate both in height and class for a 1272 ACSS conductor application. However, 6 tangent structures, direct embedded, have been included in the estimate to account for unknown circumstances resulting in sag deficiencies.

Conductors: 41,860lbs of conductor will be required. The proposed conductor will be a 1272 ACSS conductor with a rating of 1957Amps at 347° F or 390MVA.

Shield Wires: Assume that the existing 48mm^2/.421 OPTGW fiber optic shield wire will be adequate and will not be replaced during this project.

Insulators: It is assumed that all insulators are in good shape and will be reused. However, hardware will be replaced as a result of the change from ACSR to ACSS conductor.

18 tangent insulators have been included in the estimate to account for the 6 tangent structures included in the estimate.

Removals: The removal costs for six poles have been included in the estimate.

Long lead items:

Material Description	Lead Time (Weeks)*
Insulators	12
ACSS Conductor	14
Steel Structures and poles	20

*As of 2/15/2011

Specific assumptions related to line design: Existing structures are adequate enough (Height and Class) to accommodate the 1272 ACSS conductor.

Existing structure insulators are still in good enough condition to be reused with only a hardware change..

Minimal clearing/tree trimming will be required along the route.

Construction methodology: It is assumed that an outage would be granted to replace the conductors and it will be done on the existing right of way using new conductor size. Some poles may be required to be replaced.

Outage requirements: Line outages will be required while this line is under construction. If the sections that get replaced include spans into the substations, then outages on substation buses and other equipment may be required.

Safety Considerations and risks during Construction: Use caution when working in metropolitan area. Several areas of safety include traffic, road crossings, distribution crossings and possible distribution under build.

4.3 Rex Brown Substation (Mississippi)

General: Bus upgrade and line jumpers are required to be upgraded to match new line rating of 336.

Site: None

Foundation: None

Electrical: In the Miami bay, replace 1780 ACSR conductor capable of 1608A with double 954 MCM. Replace the riser and the breaker jumpers on one side of breaker J5897.

Remove 150 ft of 1780 and install 300 ft of 954 (150 ft of double 954 ACSR).

Relay Design: None

Long Lead Items:

Material Description	Lead Time (Weeks)*
Bare Conductor	14 weeks

*As of 2/15/2011

RTU: None

Relay settings: Model upgraded line to Jackson Monument in Aspen Oneliner for both line segments being upgraded (Rex Brown – Miami and Miami to Jackson Monument).

Revise relay settings (SEL421 and MDAR) using new line impedances and line rating for upgraded line. Settings may need to be revised twice depending on timing of the upgrades.

Construction methodology: Work is to be completed during same outage as line re-conductor work. Relay settings to be completed prior to new line conductor being energized.

Outage requirement: A mobile transformer would be required

Safety considerations and risks during construction: None specified

4.4 Miami Substation (Mississippi)

General: Bus and line jumpers are required to be upgraded to match new line rating (line to Rex Brown) of no less than 336MVA

Site: None

Foundation: None

Electrical: Replace 1780 ACSR conductor capable of 1608A with double 954 MCM including jumpers to switch, operating bus, and jumpers to operating bus. Remove 600 ft of 1780 and install 1200 ft of 954 (600 ft of double 954 ACSR).

Relay Design: None

Long Lead Items:

Material Description	Lead Time (Weeks)*
Bare Conductor	14 weeks

*As of 2/15/2011

RTU: None

Relay settings: No settings work required since this is a tapped substation.

Construction methodology: Work will require an entire substation outage with the possible use of the mobile transformer if distribution load cannot be served from other area stations. Work is to be completed during same outage as line re-conductor work

Outage requirement: Mobile transformer is required

Safety considerations and risks during construction: None specified

4.5 Re-energize the idle Danville-Winnfield 34.5kV line to covert to 115kV and convert the existing Danville-Winnfield 115kV line to 230kV operation (N_LA)

The following work is required:

The existing line between Danville and Winnfield is constructed on single pole, double circuit steel structures with davit arms. The structures are framed (vertical spacing) for double circuit 230kV construction. The east circuit has 666 ACSR conductor and is insulated for 230kV. The west circuit has 4/0 ACSR conductor with 34.5kV insulation. Several spans of the de-energized 34.5kV are down or missing. The required ampacity for both the new re-energized 115kV side (existing de-energized 34.5kV) and the converted 230kV side (existing 115kv) is 883 amps.

The conductor and insulators on the existing energized 115kV side will be adequate to meet the upgrade to 230kV. However, new structures will be required at Danville and Winnfield to cut the line into the new 230kV bays. At Dodson, which is between Winnfield and Danville, the 230kV line will need to be routed around the station. Two new structures will be required at the LAGen (Jeld-Wen) station on the converted 34.5kV (new 115kV) side. The LAGen station will remain on the 115kV circuit and will need to be fed from the 34.5kV upgrade. All of the new structures will be direct embedded (concrete) poles, guyed in the full tension direction and self supporting in the slack / reduced tension direction. If this project is executed, swapping the 230kV and 115kV circuits should be investigated for possible savings. Transmission Planning shall be consulted before making this investigation. (Both circuits will have 666 ACSR conductors with an ampacity of 883 amps).

The wire for the 34.5kV upgrade will be 666 Flamingo. The existing 34.5kV insulators and 4/0 ACSR conductor will be removed from the west circuit and replaced with new 161kv suspension insulators and 666 ACSR conductors. The existing shield wire will remain in place. However, several new spans of 7#7 shield wire will be required at the substations for the routing into the new bays and for the run around at Dodson.

Quantity	Material Description	*Lead Time (weeks)
15 ea	Concrete poles	18
648 ea	Insulators	16
287k lbs	666 ACSR Flamingo	18

*As of 2/15/2011

Line Construction (Methodology, Duration of Construction, Outages): Line construction will involve three line sections: Winnfield to Jeld-Wen, Jeld-Wen to Dodson, and Dodson to Danville with an outage being required on each one. Methodology will include mobilizing line contractor, receiving materials, taking outage, and performing work as detailed in the above work scope. The total construction duration is estimated to be 26 weeks.

4.6 Winnfield 230kV Substation: Install line bay (N_LA)

The following work is required:

Install new 230kV line bay for a line termination from Danville 230kV Substation. Extend the existing 230kV operating bus and build new line bay.

Site: The site has been developed with fence and limestone. The existing site provides enough space to install the new line bay. Limestone will be required to restore ground disturbed by movement of vehicles and foundation work.

Foundations: Extend existing cable trough 48ft, poured in place. Install copperweld ground leads to the existing ground grid. Install the following foundations to facilitate the substation addition.

- Ten (10) 230kV Low elevation bus support foundations
- Two (2) 230kV Breaker foundations
- Five (5) 230kV High Elevation Switch support foundations
- One (1) 230kV Full Tension Deadend foundations
- Seven (7) 230kV Equipment support pedestal foundations
- Four (4) yard lights

Electrical: Install new 230kV line bay for The Danville line termination per station oneline L0039S05. Expand the existing operating bus. Install a transfer bus and extend the two existing bays to the transfer bus. In Transformer bay #1 remove one bus support and install one breaker, one switch on existing switch structure and one switch on a new structure. Extend the bus to the new transfer bus. In existing line bay install one switch on a new structure and extend the bus to the new transfer bus. In the new line bay, install one breaker, three switches with structures, and one 10AS deadend structure. The following material is required for station expansion:

- Two (2) 230kV Breaker
- Seven (7) 230kV Switches including one with ground
- Six (6) surge arresters
- One (1) 230kv 10AS deadend with bus support
- Ten (10) 230kV Low elevation bus supports
- Five (5) 230kV High Elevation Switch supports
- Seven (7) 230kV Equipment support pedestals
- Four (4) yard lights
- One (1) lot bus work
- One (1) lot insulators
- REMOVE one (1) bus support

Relay: The existing autotransformer is fed from the operating bus with no breaker. This bay will have a new breaker installed to disconnect the autotransformer from the operating bus. A new breaker control panel will be used for this new breaker. A new line bay will be built with a new breaker for the new Danville line. This line will use DCUB line/breaker panel for protection. Once the operating bus is completed, it will have a new bus differential panel to protect it. The existing RTU is a D20, but must be upgraded to use the communications processor. The AC and DC panel are assumed to be adequate.

- Install one (1) bus differential panel with SEL 487B as per Entergy standard.
- Install one (1) DCUB line/breaker panel as per Entergy standard.
- Install one (1) breaker control panel with SEL 351-7 as per Entergy standard.
- Install one (1) line trap on the new Danville line.
- Install one (1) line tuner on the new Danville line.
- Install one (1) CCVT with carrier accessories on the new Danville line.
- Install one (1) single phase CCVT junction box on the new Danville line.
- Upgrade RTU motherboard to ME II. The status and control cards are assumed to be adequate.
- Install one (1) Communications Processor, Orion 5r.
- One Lot of Control Cable

Communications and SCADA: The RTU will be upgraded with an ME II processor to accommodate the Orion 5r processor. New alarms and control points will need to be configured.

RTU configuration and settings: Settings for all new relays and surrounding area would be required as well as development of configuration for RTU for additional status, control and indications

Construction methodology and outages required: Grading work and fence expansion should not be required. Foundation work may require some short outages to existing autotransformer bank and/or line but this will depend on final foundation design. The majority of the electrical construction can be completed without outages. An extended outage will be required to tie-in new construction. Relay checkout will include new differential scheme and end to end checks on the new line to Danville.

Task Specific Assumptions:

- Fault current does not exceed 40kA
- Control house does not require expansion.

Long delivery items:

Quantity	Material Description	*Lead Time (weeks)
1	230kV Breaker control panel	16
1	Diff Panels	16
1	Breaker Panel	16
1	Line Trap	18
1	Line Tuner	18
1	230kV CVT	24
2	230kV Breakers	22
7	Disconnect switches	18
1 lot	Steel Structures for buswork	20
6	Arresters	16
1 lot	Insulators	14
1 lot	Buswork	14

*As of 2/15/2011

4.7 Danville 230kV Substation: Install line bay

The following work is required:

Convert the existing single bay to three breaker bays with a operating and transfer buses.

Site: The site has been developed and fenced. The existing site provides enough space to install the new bays. 600 tons of limestone will be required to restore ground disturbed by movement of vehicles and foundation work and expand the existing rocked area to include the new bays and bus work.

Foundations: Install Copperweld ground leads to the existing ground grid. Install the following foundations to facilitate the substation addition.

- Two (2) 230kV Breaker foundations
- Seven (7) 230kV High Elevation Switch support foundations
- Fourteen (14) 230kV Low elevation bus support foundations
- Two (2) 230kV Full Tension Dead-end foundations
- Ten (10) 230kV Equipment support pedestal foundations
- Four (4) yard lights

Electrical: In order to install a new 230kV line from Winnfield, the Danville 230kV substation will have to be expanded to include an operating bus, a transfer bus, and three bays. To accomplish this, the existing 230kV termination for the Grambling 230kV line and 230/115kV autotransformer will have to be re-configured per station oneline L0436S05. In line bay #1, terminating the existing Grambling 230kV line, a new switch will have to be installed and the bay extended to both the new operating bus and transfer bus. In transformer bay #2, install one breaker, three switches with structures, including one ground switch, and a 10AS dead-end structure to terminate the autotransformer. In the third bay, terminating the new Winnfield 230kV line, install one breaker, three switches with structures, including one ground switch, and a 10AS deadend structure. The following material is required for station expansion:

- Two (2) 230kV Breaker
- Seven (7) 230kV Switches including one with ground
- Seven (7) 230kV High Elevation Switch supports
- Fourteen (14) 230kV Low elevation bus supports
- Two (2) 230kv 10AS deadend with bus supports
- Ten (10) 230kV Equipment support pedestals
- Six (6) surge arresters
- One (1) lot bus work
- One (1) lot insulators
- Four (4) yard lights

Relay: The existing autotransformer is fed from a shared line breaker. A new bay will have a breaker installed and the autotransformer will be fed from here. The existing transformer differential currents will be moved to the new breaker. A new breaker control panel will be used for this new breaker. This will leave the existing breaker (R2629) to disconnect the existing Mt. Olive line from the operating bus. The existing 115kV bus potentials will be removed from the Mt. Olive line panel, and replaced by the new 230kV bus potentials.

A new line bay will be built with a new breaker for the new Winnfield line. This line will use DCUB line/breaker panel for protection. Once the operating bus is completed, it will have a new bus differential panel to protect it. The existing RTU is a D20, but must be upgraded to use the communications processor. The AC and DC panel are assumed to be adequate.

- Install one (1) bus differential panel with SEL 487B as per Entergy standard.
- Install three (3) CCVT's with carrier accessories for the bus potential.
- Install an indoor bus potential distribution box.
- Install an outdoor bus potential junction box made of stainless steel.
- Install one (1) DCUB line/breaker panel as per Entergy standard.
- Install one (1) breaker control panel with SEL 351-7 as per Entergy standard.
- Install one (1) line trap on the new Winnfield line.
- Install one (1) line tuner on the new Winnfield line.
- Install one (1) CCVT with carrier accessories on the new Winnfield line.
- Install one (1) single phase CCVT junction box on the new Winnfield line.
- The AC and DC panel are assumed to be adequate.
- Upgrade RTU motherboard to ME II. The status and control cards are assumed to be adequate.
- Install one (1) Communications Processor, Orion 5r.
- One Lot of Control Cable

Communications and SCADA: The RTU will be upgraded with an ME II processor to accommodate the Orion 5r processor. New alarms and control points will need to be configured.

RTU configuration and settings: Settings for all new relays and surrounding area would be required as well as development of configuration for RTU for additional status, control and indications

Construction methodology and outages required: Grading work and fence expansion should not be required. Foundation work may require some short outages to existing autotransformer bank and/or line but this will depend on final foundation design. The majority of the electrical construction can be completed without outages. An extended outage will be required to tie-in new construction. Relay checkout will include new differential scheme and end to end checks on the new line to Winnfield.

Task Specific Assumptions:

- Fault current does not exceed 40kA
- Control house does not require expansion.

Long delivery items:

Quantity	Material Description	*Lead Time (weeks)
1	230kV Breaker control panel	16
1	DIff Panels	16
1	Breaker Panel	16
1	Line Trap	18
1	Line Tuner	18
4	230kV CVT	24
2	230kV Breakers	22
7	Disconnect switches	18
1 lot	Steel Structures for buswork	20
6	Arresters	16
1 lot	Insulators	14
1 lot	Buswork	14

*As of 2/15/2011

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.

Cost Analysis

Task	2011	2012	2013	2014	Total
Ray Braswell to Wynndale+	-	-	-	-	-
Rex Brown to Miami line upgrade	$23,886	$307,082	$453,584	$0	$784,552
Loblolly to Hammond+	-	-	-	-	-
Ridgeland to Madison+	-	-	-	-	-
Danville – Winnfield line	$132,655	$1,609,835	$4,065,530	$0	$5,808,020
Florence to Star line upgrade+	-	-	-	-	-
Rex Brown Substation	$1,264	$8,229	$95,068	$0	$104,561
Miami Substation	$1,584	$11,007	$158,773	$0	$171,363
Danville SS	$62,609	$1,306,618	$1,469,513	$0	$2,838,740
Winnfield SS	$62,009	$1,087,965	$1,161,824	$0	$2,311,799
S. Jackson – Florence 115kV FFR payment	-	-	-	-	$1,917,480
Sterlington 3rd 500/115kV auto FFR payment	-	-	-	-	$426,591
Total	**$284,007**	**$4,330,736**	**$7,404,292**	**$0**	**$14,363,106***

+ Projects already approved and being constructed by Entergy.

*This cost does not include Tax Gross Up which may apply.

6. UPGRADE CLASSIFICATION

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.

Task	Total Cost	Base Plan	Supplemental	Reference
Ray Braswell - Wynndale+	-	-	-	1.1.1
Rex Brown - Miami line upgrade	$784,552	$0	$784,552	4.2
Loblolly - Hammond+	-	-	-	1.1.1
Danville - Winnfield line	$5,808,020	$0	$5,808,020	4.5
Ridgeland - Madison+	-	-	-	1.1.1
Florence - Star line upgrade+	-	-	-	1.1.1
Rex Brown Substation	$104,561	$0	$104,561	4.3
Miami Substation	$171,363	$0	$171,363	4.4
Danville SS	$2,838,740	$0	$2,838,740	4.7
Winnfield SS	$2,311,799	$0	$2,311,799	4.6
S. Jackson – Florence 115kV FFR payment	$1,917,480	-	$1,917,480	1.1.4
Sterlington 3rd 500/115kV auto FFR payment	$426,591	-	$426,591	1.1.4
Total	**$14,363,106***	**$0**	**$14,363,106***	

+ Projects already approved and being constructed by Entergy

*This cost does not include Tax Gross Up which may apply.

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 April 2014. This is based on an assumed customer approval date of July 2011.

Task Name	Estimated Start Date	Estimated ISD/Completion
Rex Brown to Miami line upgrade	July 2011	April 2013
Rex Brown Substation	July 2011	April 2013
Miami Substation	July 2011	April 2013
Danville to Winnfield line	July 2011	April 2014
Danville SS	July 2011	April 2014
Winnfield SS	July 2011	April 2014

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.
- Scheduling assumption and completion dates:
- Submission to ICT in February 2011
- Approval to proceed with the project – end of July 2011
- Funding Project (FP)/Work Order approvals – 1 month = end of July 2011
- Initiation – Project Scoping Plan – end of August 2011
- Definition phase – completion of Project Execution Plan/Estimates – end of February 2012

  Revised FP approved by middle of March 2012

  Commence Engineering – issue design packages by end of September 2012

  Order material in July 2012 after constructability review for receipt by the end of December 2012

  Secure permits by December 2012

  Commence construction in January 2013.

  Rex Brown – Miami line and substations – Commence construction in March and conclude in April as SOC has recommended less likelihood of getting outages in January, February or May 2013

  Winnfield and Danville Substations – Construct during outage of 115kV line and complete it before the 34.5kV line upgrade has been completed

  Danville to Winnfield 34.5kV line upgrade - Since 26 weeks are required for the upgrade, outage on existing line between Danville and Winnfield 115kV line (on the same structure 34.5kV line exists and after completion of upgrade of 34.5kV line would be energized at 230kV) may not be granted in its entirety and require splitting in three parts - one starting in January and ending at the end of April 2013, followed by October – December 2013 and lastly Feb – April 2014.

8. INTERCONNECTION STANDARDS

http://www.entergy.com/transmission/facility_requirements.aspx

9. RISK ASSESSMENT

Risk	Comment	Impact
Underground site issues (Pipelines, wells, containments)	Unknown underground factors will add mitigation costs and may impact schedule	***
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.	***
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.	***

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

10. CONFIRMED RESERVATIONS

Prior transmission service requests that were included in this study:

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 2010 – 2011 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 233	PID-233	150	12/31/2013

Prior transmission service requests that were included in this study:

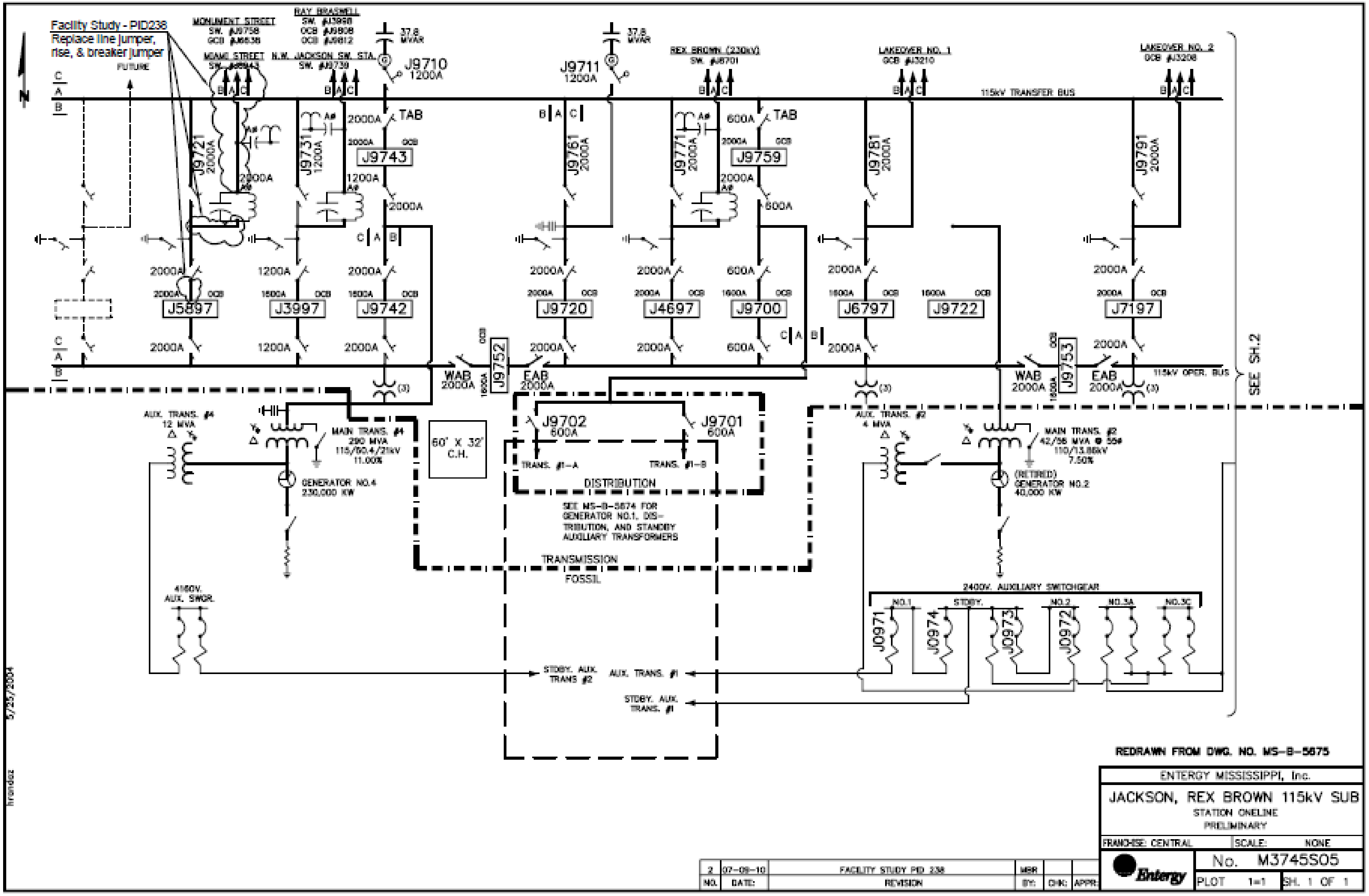
OASIS #		PSE	MW	Begin	End
1668165		Entergy Services (SPO)	600	1/1/2013	1/1/2043

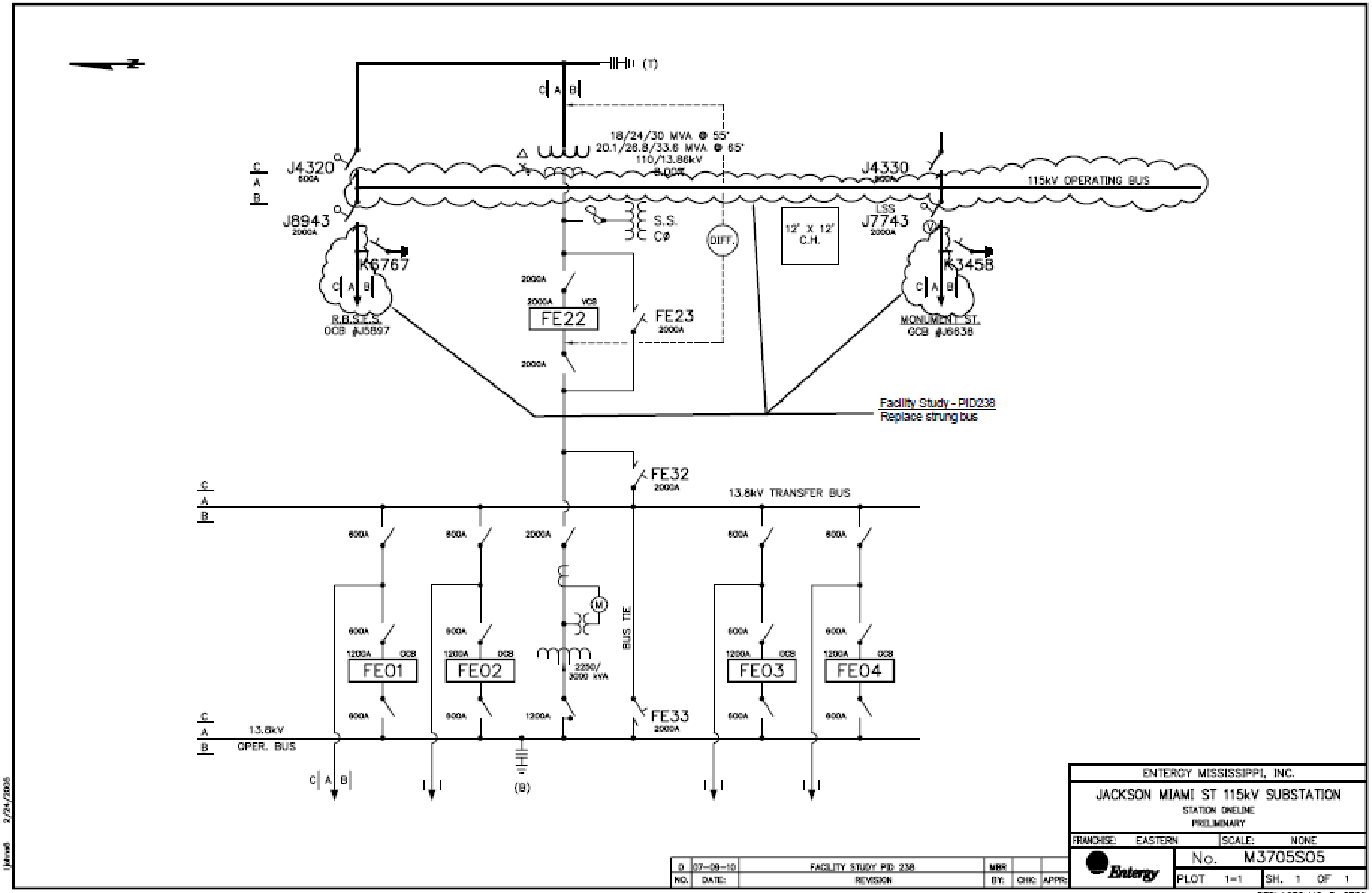
11. ATTACHMENTS

11.1 Table of Acronyms

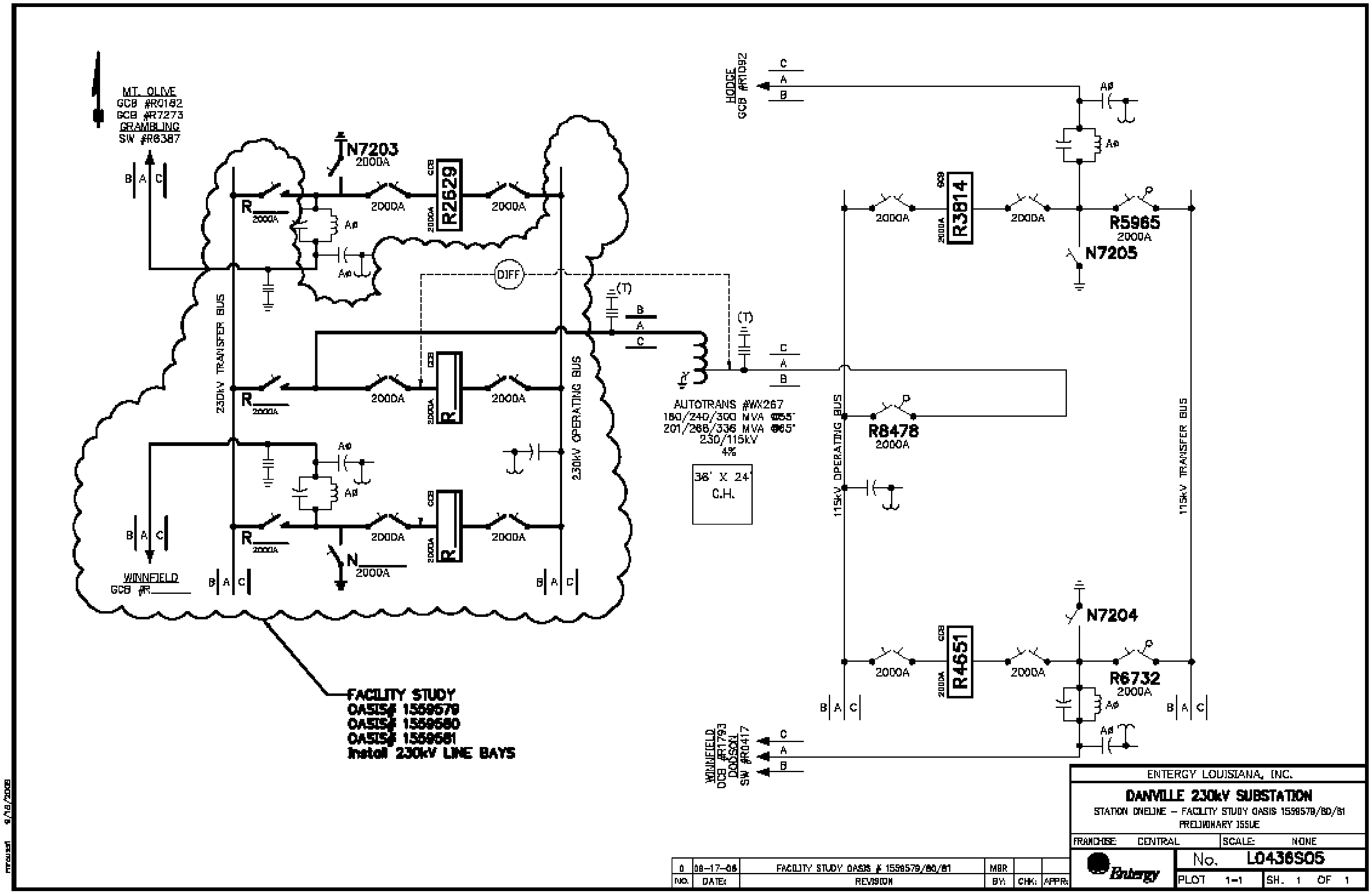
ACSR	Aluminum Conductor Steel Reinforced
ACSS	Aluminum Conductor Steel Supported
ADEQ	Arkansas Department of Environmental Quality
AECC	Arkansas Electric Cooperative Corporation
AFUDC	Allowance for Funds Used During Construction
ATC	Available Transfer Capability
BMP	Best Management Practice
CCN	Certificate of Compliance and Need
CCVT	Coupling Capacitor Voltage Transformer
CVT	Capacitor Voltage Transformer
EES	Entergy Control Area
EHV	Extra-High Voltage
ERIS	Energy Resource Interconnection Service
ICT	Independent Coordinator of Transmission
LIDAR	Light detection and ranging
kV	Kilo-Volt
MCM	(M) Thousand Circular Mils
MVA	Mega-Volt Amp
MW	Mega-Watt
NESC	National Electric Safety Code
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
PT	Potential Transformer
ROW	Right of Way
RTU	Remote Terminal Unit
SAIC	Science Applications International Corporation
SES	Steam Electric Station
SOC	System Operations Center
SHV	Super High Voltage
SW	Switch Station
TOC	Transmission Operations Center

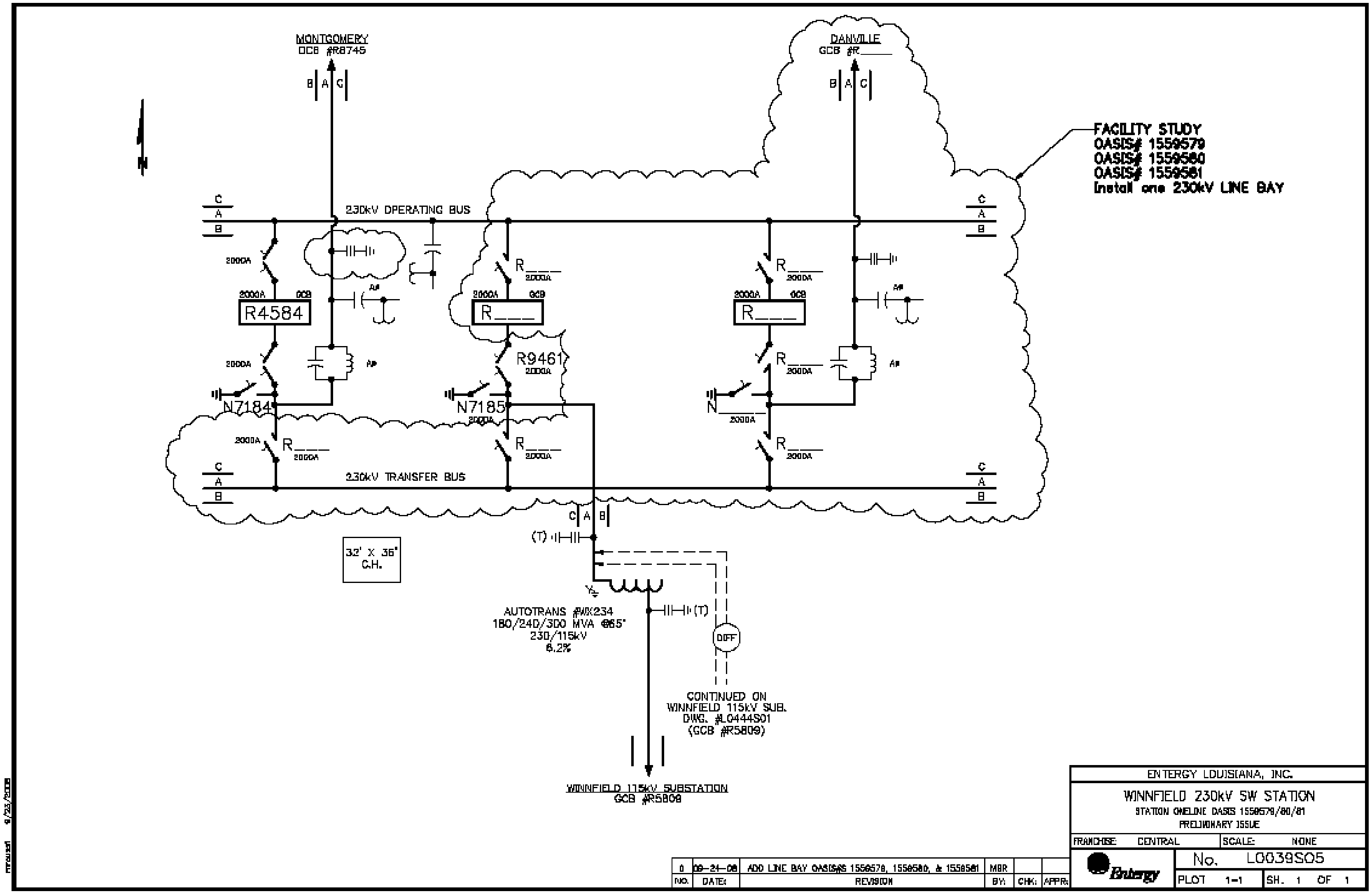
11.2 One Line Diagrams





(T)
18/24/30 MVA @ 55°
20.1/26.8/33.6 MVA @ 65°
110/13.86kV
J4320
J8943
K6767
R.B.S.T.S.
S.S.
DIFF.
12' X 12' C.H.
J4330
115kV OPERATING BUS
J7743
K3458
MONUMENT ST.
FE22
FE23
Facility Study - PID238
Replace strung bus
FE32
13.8kV TRANSFER BUS
BUS TIE
FE01
FE02
FE03
FE04
FE33
13.8kV
OPER. BUS
2250/ 3000 kVA
(B)
ENTERGY MISSISSIPPI, INC.
JACKSON MIAMI ST 115kV SUBSTATION
STATION ONELINE
PRELIMINARY
FRANCHISE: EASTERN
SCALE: NONE
No. M3705S05
PLOT 1=1
SH. 1 OF 1
FACILITY STUDY PID 238
REVISION


MT. OLIVE
GCB #R0182
GCB #R7273
GRAMBLING
SW #R6387
N7203
2000A
R2629
230kV TRANSFER BUS
230kV OPERATING BUS
DIFF
AUTOTRANS #WX267
230/115kV
4%
36' X 24'
C.H.
HODGE
GCB #R1092
R3814
R5965
N7205
N7204
R8478
R4651
R6732
115kV OPERATING BUS
115kV TRANSFER BUS
WINNFIELD
GCB #R
FACILITY STUDY
OASIS# 1559579
OASIS# 1559580
OASIS# 1559581
Install 230kV LINE BAYS
ENTERGY LOUISIANA, INC.
DANVILLE 230kV SUBSTATION
STATION ONELINE - FACILITY STUDY OASIS 1559579/80/81
PRELIMINARY ISSUE
FRANCHISE: CENTRAL
SCALE: NONE
No. L0436S05
PLOT 1-1
SH. 1 OF 1
0 08-17-08 FACILITY STUDY OASIS # 1559579/80/81 MBR
NO. DATE: REVISION BY: CHK: APPR:
Entergy



MONTGOMERY
GCB #R8745
DANVILLE
GCB #R____
FACILITY STUDY
OASIS# 1559579
OASIS# 1559580
OASIS# 1559581
Install one 230kV LINE BAY
230kV OPERATING BUS
230kV TRANSFER BUS
R4584
R9461
N7184
N7185
32' X 36' C.H.
AUTOTRANS #WX234
180/240/300 MVA @65°
230/115kV
8.2%
CONTINUED ON
WINNFIELD 115kV SUB.
DWG. #L0444S01
(GCB #R5809)
WINNFIELD 115kV SUBSTATION
GCB #R5809
ENTERGY LOUISIANA, INC.
WINNFIELD 230kV SW STATION
STATION ONELINE OASIS 1559579/80/81
PRELIMINARY ISSUE
FRANCHISE: CENTRAL
SCALE: NONE
No. L0039S05
PLOT 1=1
SH. 1 OF 1
0 09-24-08 ADD LINE BAY OASIS#S 1559579, 1559580, & 1559581 MBR
NO. DATE: REVISION BY: CHK: APPR: