UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

May 28, 2003

Joseph E. Venable
Vice President Operations
Waterford 3
Entergy Operations, Inc.
17265 River Road
Killona, Louisiana 70066-0751

SUBJECT: WATERFORD 3 - NRC INSPECTION REPORT 50-382/03-10

Dear Mr. Venable:

On April 18, 2003, the NRC completed an inspection at your Waterford Steam Electric Station, Unit 3. The enclosed report documents the inspection findings which were discussed on April 17, 2003, with Mr. Venable, Vice President Waterford 3, and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

On the basis of the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles S Marschall, Chief
Engineering and Maintenance Branch
Division of Reactor Safety

Docket: 50-382
License: NPF-38

Enclosure:
NRC Inspection Report
50-382/03-10

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	50-382
License:	NPF-38
Report No.:	50-382/03-10
Licensee:	Entergy Operations, Inc.
Facility:	Waterford Steam Electric Station, Unit 3
Location:	Hwy. 18 Killona, Louisiana
Dates:	March 31 through April 18, 2003
Team Leader:	P. Goldberg, Senior Reactor Inspector Engineering and Maintenance Branch
Inspectors:	G. Miller, Reactor Inspector Engineering and Maintenance Branch
	R. Nease, Senior Reactor Inspector Engineering and Maintenance Branch
	J. Taylor, Reactor Inspector Engineering and Maintenance Branch
Accompanying Personnel:	G. Skinner, Contractor, Beckman and Associates D. Votolaro, Intern, NRC Headquarters
Approved By:	Charles S. Marschall, Chief Engineering and Maintenance Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000382/2003-010; Entergy Operations, Inc.; 3/31-4/18/2003; Waterford Steam Electric Station, Unit 3; safety system design and performance capability and evaluation of changes, tests, or experiments.

The NRC conducted a 4-week inspection with a team of four regional inspectors and one contractor. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

Report Details

1. REACTOR SAFETY

Introduction

The NRC performed an inspection to verify that the licensee adequately preserved the facility safety system design and performance capability and that the licensee preserved the initial design in subsequent modifications of the systems selected for review. The scope of the review also included any necessary nonsafety-related structures, systems, and components that provided functions to support safety functions. The inspection effort also reviewed the licensee's programs and methods for monitoring the capability of the selected systems to perform the current design basis functions. This inspection verified aspects of the initiating events, mitigating systems, and barrier cornerstones.

The licensee based the probabilistic risk assessment model for the Waterford Steam Electric Station, Unit 3, on the capability of the as-built safety systems to perform their intended safety functions successfully. The team determined the area and scope of the inspection by reviewing the licensee's probabilistic risk assessment models to identify the most risk significant systems, structures, and components according to their ranking and potential contribution to dominant accident sequences and/or initiators. The team also used a deterministic effort in the selection process by considering recent inspection history, recent problem area history, and all modifications developed and implemented.

The team reviewed in detail the essential chilled water system and the emergency diesel generator system. The primary review prompted parallel review and examination of support systems, such as, electrical power, instrumentation, and related structures and components.

The team assessed the adequacy of calculations, analyses, engineering processes, and engineering and operating practices used by the licensee to support the performance of the safety systems selected for review and the necessary support systems during normal, abnormal, and accident conditions. Acceptance criteria utilized by the NRC inspection team included NRC regulations, the technical specifications, applicable sections of the Updated Final Safety Analysis Report, applicable industry codes and standards, as well as, industry initiatives implemented by the licensee's programs.

1R02 Evaluations of Changes, Tests, or Experiments (71111.02)

a. Inspection Scope

The team reviewed two licensee-performed 10 CFR 50.59 evaluations to verify that the licensee had appropriately considered the conditions under which the licensee may make changes to the facility or procedures or conduct tests or experiments without prior NRC approval.

The team reviewed an additional 17 licensee-performed 10 CFR 50.59 screenings, in which the licensee determined that evaluations were not required to ensure that the licensee's exclusion of a full evaluation was consistent with the requirements of 10 CFR 50.59.

The team reviewed and evaluated the most recent licensee 10 CFR 50.59 program audit to determine whether the licensee conducted sufficient in-depth analyses of their program to allow for the identification and subsequent resolution of problems or deficiencies.

b. Findings

No findings of significance were identified.

1R21 Safety System Design and Performance Capability (71111.21)

.1 System Requirements

a. Inspection Scope

The team reviewed the following attributes of the essential chilled water and emergency diesel generator systems: (1) process medium (water, steam, and air), (2) energy sources, (3) control systems, and (4) equipment protection. The team examined the procedural instructions to verify instructions were consistent with actions required to meet, prevent, and/or mitigate design basis accidents. The team also considered requirements and commitments identified in the Updated Final Safety Analysis Report, technical specifications, design basis documents, and plant drawings.

The team reviewed the reliability and availability of electrical systems used for operation of the essential chilled water system. The team evaluated the 4160V medium voltage system to assess vulnerabilities due to loss of the preferred offsite source and the standby onsite sources (diesel generators). In particular, the team evaluated adequacy of undervoltage protection and vulnerability to spurious separation from the offsite source. The team reviewed electrical elementary diagrams to assure that proper control and protection logic was applied to system equipment and supporting electrical systems. The team reviewed the emergency diesel generators with respect to their function as a source of electric power as well as with respect to their requirements for electric power from supporting systems. The team assessed whether the diesels would start in response to valid signals and whether diesel and generator protective trips were bypassed during emergency operation as described in the licensing and design bases.

Findings

No findings of significance were identified

.2 System Condition and Capability

a. Inspection Scope

The team reviewed the periodic testing procedures for the essential chilled water and emergency diesel generator systems to verify that the licensee adequately designed the systems. The team also reviewed the systems' operations by conducting system walkdowns; reviewing normal, abnormal, and emergency operating procedures; and

reviewing the Updated Final Safety Analysis Report, technical specifications, design calculations, drawings, and procedures.

The team reviewed the installed configuration of the essential chilled water and emergency diesel generator systems. The team performed a field inspection of the essential water chillers, the essential chilled water pumps, 4160V switchgear, 480V switchgear, and their environs, to assess whether the installed configuration would support system functions under accident conditions. These items were inspected for adequacy of material condition, absence of hazards, conformance of installed components and configurations with design documents. Electrical loading displayed on local instruments was observed for comparison with design calculations. Switchgear were specifically inspected for adequacy of component identification, proper configuration and functioning of meters and relays, and the status of required enclosure fasteners and latches. The team performed a field inspection of the emergency diesel generators and fuel oil storage tank areas. The diesels were inspected for adequacy of material condition, absence of hazards, conformance of installed components and configurations with design documents. The team observed the "A" diesel generator during full load testing and inspected for appropriate instrument readings, excessive vibration, leaks or other anomalous conditions. The fuel oil storage tank areas were inspected for material condition, absence of hazards, conformance of installed components and configurations with design documents. In particular, the areas were inspected for accessibility, and presence of flooding hazards.

Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors examined a sample of problems identified by the licensee in the corrective action program to evaluate the effectiveness of corrective actions related to design issues. The sample included open and closed condition reports for the past three years that identified issues affecting the selected systems. Older condition reports that were identified while performing other areas of the inspection were also reviewed.

b. Findings

No findings of significance were identified.

.4 System Walkdowns

a. Inspection Scope

The inspectors performed walkdowns of the accessible portions of the essential chilled water and emergency diesel generator systems, and required support systems. The inspectors focused on the installation and configuration of switchgear, motor control

centers, manual transfer switches, field cabling, raceways, piping, components, and instruments. During the walkdowns, the inspectors assessed:

- The placement of protective barriers and systems,
- The susceptibility to flooding, fire, or environmental conditions,
- The physical separation of trains and the provisions for seismic concerns,
- Accessibility and lighting for any required local operator action,
- The material condition and preservation of systems and equipment, and
- The conformance of the currently-installed system configurations to the design and licensing bases.

b. Findings

Introduction: A finding was identified in that both emergency diesel generators could be lost due to potential flooding in both emergency diesel generator fuel oil storage tank (FOST) rooms due to leaking check valves installed in the industrial waste non-safety related drain systems connected to the rooms. This is an unresolved item (URI) pending a thorough review of the industrial waste system piping configuration by the licensee.

Description: During a walkdown of the emergency diesel generator FOST area "A", the team observed the automatic operation of the FOST area sump pump. The pump operated for several minutes, during which time a check valve in the sump discharge line leaked a fluid that appeared to be water. The team noted that the fluid had a strong smell of ammonia. The licensee stated that the function of the non-safety related FOST area sump system was to capture and remove fuel oil in case of a leak in the area. The licensee attributed the presence of water in the FOST area sump to back leakage of water pumped from the industrial waste sump. The team reviewed flow diagrams for the sump system which showed that water would have to leak past two check valves in order to enter the FOST area sump from the industrial waste sump discharge. The valve observed by the team to be leaking had been previously repaired in 1999, but was not subjected to a post maintenance leak test.

The team was concerned that flooding of the FOST areas due to leakage from the sump system could disable both emergency diesel generator fuel oil transfer pumps, which were mounted approximately 11 inches above the floor adjacent to the FOSTs. The team was particularly concerned that water could enter the sump system from open sumps in the turbine building and yard areas during a site flood, and be directed past leaking check valves by gravity or siphoning into the FOST area sumps, and thence onto the FOST area floors. The team noted that during a flood, offsite power may not be available, so the non-safety related FOST area sump pumps would not be available to remove the water. There would also be no indication that flooding was occurring in the FOST areas. A limited walkdown of the sump system indicated that flooding of

FOST areas during a site flood was unlikely due to the elevation and configuration of the piping.

The licensee initiated condition reports to address the industrial safety issues relating to presence of ammonia in the FOST area sumps (W3-2003-01039), the leaking check valve observed by the team (W3-2003-01040), and the potential for flooding the FOST areas via the sump system (W3-2003-01045). The licensee also initiated CR-W3-2003-1093 in response to the team's concern that the 11 inch elevation of the fuel oil transfer pumps above the FOST area floor was not consistent with the existing flooding analysis that was based on equipment being at least 12 inches above the floor.

Analysis: The risk of this issue will be evaluated if the inspectors determine that the emergency diesel generator fuel oil storage tanks are vulnerable to flooding via leaking check valves installed in the industrial waste drain system. This item is unresolved pending receipt of additional information from the licensee concerning the results of their review of the industrial waste drain system.

Enforcement: Appendix A to 10 CFR Part 50, Criterion 2 states that systems, structures, and components important to safety shall be designed to withstand the effects of natural phenomena, such as floods, without loss of capability to perform their safety functions. The team identified a potential common cause flooding vulnerability for the emergency diesel generators from back-leakage through check valves installed in the industrial waste drain system. Specifically, in the event of a flood that causes a loss of offsite power, inventory in the industrial waste drain system could leak to the emergency diesel generator FOST sumps, and overflow into the room flooding the fuel oil transfer pumps. Without offsite power, sump pumps in the FOST room would not operate. Whether this issue is a violation remains unresolved pending receipt of additional information from the licensee concerning the results of their review of the industrial waste drain system piping configuration to determine if it would be possible for water to flow back into the FOST room sumps from the various sumps connected to the non-safety industrial waste system. (URI 382/0310-01).

.5 Design Review

a. Inspection Scope

The team reviewed the current as-built instrumentation and control, electrical, and mechanical design of the essential chilled water and emergency diesel generator systems. These reviews included an examination of design assumptions, calculations, required system thermal-hydraulic performance, electrical power system performance, protective relaying, control logic, and instrument setpoints and uncertainties. The inspectors also performed selected single-failure evaluations of individual components and circuits to determine the effects of such failures on the capability of the systems to perform their design safety functions.

The team inspected calculations, drawings, specifications, vendor documents, Updated Final Safety Analysis Report, technical specifications, emergency operating procedures, and temporary and permanent modifications.

b. Findings

No findings of significance were identified.

.6 Safety System Inspection and Testing

a. Inspection Scope

The inspectors reviewed the program and procedures for testing and inspecting selected components in the essential chilled water and emergency diesel generator systems. The review included the results of surveillance tests required by the technical specifications and selective review of Class 1E control circuits for testability. The team reviewed the acceptance criteria for undervoltage relay calibrations to determine if it was supported by both the electrical load flow and relay accuracy calculations. In addition, the team reviewed testing procedures for standby diesel starting to assure that the diesel would start in response to valid accident and loss of voltage signals, and to verify that diesel generator protective trips were bypassed during emergency operation.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA6 Management Meetings

Exit Meeting Summary

The team leader presented the inspection results to Mr. J. Venable, Vice President Waterford 3, and other members of licensee management and staff at the conclusion of the onsite inspection on April 17, 2003.

At the conclusion of this meeting, the team leader asked the licensee's management whether any materials examined during the inspection should be considered proprietary. Some proprietary information was reviewed by the team and left at the site.

ENCLOSURE

KEY POINTS OF CONTACT

Licensee

C. Bruce, Electrical Design Engineer
R.. Bagnetto, Civil Engineer
N. Brumfield, Quality Assurance Manager
R. Dodds, Staff Vice President
R. Douet, Plant Operations General Manager
T. Fleischer, Senior Design Engineer
T. Gaudet, Outage Manager
A. Gavigan, Sumps and Drains System Engineer
R. Gilmore, Mechanical Design Engineering
J. Holman, Nuclear Engineering Manager
C. Lambert, Engineering Director
S. Mathaeu, Design Engineering Supervisor
R. Osborne, System Engineering Manager
K. Peters, Nuclear Safety Assurance Director
O. Pipkins, Senior Licensing Engineer
D. Rohli, Mechanical Design Engineering
T. Schreckengast, Operations Shift Manager
J. Venable, Vice President Waterford 3
K. Walsh, Operations Manager

NRC

M. Hay, Senior Resident Inspector

ITEMS OPENED, CLOSED, AND DISCUSSED

Items Opened

50-382/03010-01	URI	The team identified a potential finding involving the possibility of flooding both emergency diesel generator (EDG) fuel oil storage tank (FOST) rooms. Specifically, in the event of a flood and subsequent loss of offsite power, the industrial waste drain system could flow backward through nonsafety-related check valves, flooding the FOST rooms, and causing a loss of both EDGs. This potential issue is unresolved pending a thorough review of the industrial waste drain system by the licensee. (Section 1R21.4)

DOCUMENTS REVIEWED

The following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

Safety Evaluations

01-020 for ER-W3-1998-1018-007, FW IPT2000 B process line connection change.

DC-3357, Obsolete Breaker Replacement, used as basis of Pre-screen for ER-W3-98-0915-00-00

50.59 Screenings

ER-W3-2000-0279-002, "CVCISV0140 replacement."

ER-W3-01-0404-0000, "Disable EDG voltage regulator Min-Max excitation limiter," Revision 0

MM-006-050, Procedure, Revision 2, Change 0

RW-002-721, "Op & Maint of Portable Demin," Revision 2, Change 1

OP-500-011, "Control Room Cabinet M," Revision 12, Change 0

FP-001-015, "FP System Impairment," Revision 17, Change 1

OP-100-001, "Duties & Resp. of Operators on Duty," Revision 17, Change 6

RW-002-210, "Rad. Waste Solid./Dewater," Revision 13, Change 0

ME-004-231, "Station Battery Charging," Revision 1, Change 13

W3-101, "Resp./Author. of Shift Mgr. & STA," Revision 11, Change 0

HP-001-221, "TLD Rcpt.,Process., & Exposure Rpt. Generation," Revision 11

ME-4-281,213,252, & 285, "Battery Maintenance & Insp. Procedures"

Calculation 30956G-SB, "Conduit modification (Evaluation Exemption- covered by Eval. for ER-W3-2002-0352-002)"

EC-E91-06, "FP System Calc," Revision 1, Change 0

Technical Specification Basis, Sec 3/4 7-4(1) editorial change (prescreening)

AE IP1942 A, Loop Calibration Data Record (prescreening)

ER-W3-00-0279-00-00, ASCO SV Replacement

Condition Reports

2000-00017	2000-01568	2001-00977	2003-00798	2003-00997*
2000-00084	2001-00067	2001-01067	2003-00836*	2003-01005*
2000-00285	2001-00143	2001-01106	2003-00845*	2003-01093*
2000-00318	2001-00204	2001-01119	2003-00850*	2003-00850
2000-00520	2001-00208	2002-01203	2003-00860*	2003-00860
2000-00575	2001-00298	2002-01969	2003-00933*	2003-00975*
2000-00583	2001-00325	2003-00512	2003-00935*	2003-00996*
2000-00615	2001-00410	2003-00530	2003-00989*	2003-00999*
2000-01117	2001-00480	2003-00796		

* Indicates CRs generated as a result of this inspection

Engineering Evaluations

ER-W3-2001-1125-000, "CCW Monitoring Plan," Revision 0

Procedures

OP-002-004, "Chilled Water System," Revision 12, Change 1

021438, "Repetitive Maintenance Task - Verify Essential Chill Water Outlet Temperature and Flow Rate"

CE-002-007, "Periodic Analysis Scheduling Program," Revision 13

CE-002-0013, "Maintaining Essential Services Chill Water Chemistry," Revision 13

EDP-AA-20, "Engineering Calculations," Revision 16

OP-002-004, "Chilled Water System," Parts 6.2, 8.0, Revision 12

OP-903-062, "Chilled Water System Valve Line-up Check," Revision 7

OP-903-068, "Emergency Diesel Generator and Subgroup Relay Operability Verification," Revision 12

PE-004-023, "Essential Chilled Water Train B Flow Balance," Revision 12

UNT-005-012, "Administrative Program- Repetitive Task Program," Revision 8

ME-003-321, “ABB Undervoltage Relay Model 411t5375-L," Revision 2

OP-902-005, “Station Blackout Recovery," Revision 11

OP-902-000, “Standard Post Trip Actions," Revision 9

MI-005-501, “Diesel Oil Feed Tanks A and B Level Loop Check and Calibration EGFIL6903 A or B," Revision 3

MI-005-501, “ Diesel Oil Feed Tanks A and B Level Loop Check and Calibration EGFIL6903 A or B," Revision 3

OP-009-002, “Emergency Diesel Generator," Revision 18

OP-905-115, “Train “A” Integrated Emergency Diesel Generator/Engineered Safety Features Test," Revision 7

LI-101, "10CFR 50.59 Review Program, EN-S Nuclear Management Manual," Revision 3

DG-LI-101, "10CFR 50.59 Review Program Guidelines," Revision 5.

ME-004-385, "Maintenance Procedure, Essential Chiller Compressor Motor," Revision 7

PE-001-015, "Administrative Procedure - Generic Letter 89-13 Heat Exchanger Test Basis," Revision 3

PE-001-016, "Administrative Procedure - Heat Exchanger Inspection Program," Revision 1

PE-004-030, "Technical Procedure - EDG Lube Oil Cooler Performance Test," Revision 0

PE-004-031, "EDG Jacket Water Cooler Performance Test," Revision 0

Surveillance Tests

E22-PC001, "High Pressure Core Spray Pump Quarterly Operability test," Revision 12

OP-903-062, "Chilled Water System Valve Line-up Check Data Sheet," Revision 7, January through March 2003

021438, "Repetitive Maintenance Task - Verify Essential Chill Water Outlet Temperature and Flow Rate," January through March 2003

PE-004-022, "Essential Chilled Water Train A Flow Balance: Attachment 13.1," Revision 3, March 2002

PE-004-023, "Essential Chilled Water Train B Flow Balance: Attachment 13.1," Revision 3, March 2002

Work Orders

00020046	17046	401125	407352
01160099	17364	401746	416880

420019	420540	426150	433749
420021	420964	428934	436651
420294	421974	432307	437046
420296	424723	432746	437106

Calculations

5-A, "Safeguard Pump Rooms A & B," Revision 4

5-B, "Shutdown Cooling Heat Exchanger Rooms A & B," Revision 4

5-D, "Switchgear Area A & B," Revision 0, Change 11

5-I, "Emergency Feedwater Pump Rooms Post Accident Heat Loads and Local Cooler Capacity Verification," Revision 3, Change 1

5-F, "Control Room / Computer Area HVAC Cooling Loads," Revision 7

5-T, "Essential Chilled Water Cooling Loads and Coil Performance Determination," Revision 2, Change 4

5-W, "Evaluation of Space Temperatures Following a Tornado," Revision 0, Change 1

EC-M01-010, "Essential Chilled Water Cooling Loads," Revision 0

EC-I92-016-R2, "Chilled Water Outlet Temperature Instrumentation Loop Uncertainty Calculation," Revision 2, Change 2

G13.18.14, " Minimum Service Water Flow for Division 1&2 Diesel Generator Heat Exchangers," Revision 0

EC-I01-011, “Determination of Electrical Systems Measurement Channels Functional Safety Significance," Revision A

EC-191-053, “Diesel Oil Storage Tank Level Instrumentation Loop Uncertainty Calculation," Revision 1

EC-192-014, “Diesel Oil Feed Tank Level Instrumentation Loop Uncertainty Calc,”

EC-91-056, “Relay Coordination Study," Revision 1

EC-91-180, “Ower Distribution Panel Loading," Revision 2

EC-E89-008, “Electrical Design Criteria," Revision 2

EC-E90-006,”EDG Loading and Fuel Oil Consumption," Revision 5

EC-E91-050, “Degraded Voltage Relay Setpoint & Plant Load Study,” Revision 4

EC-E91-058, “Battery 3A-S Calculation for Station Blackout," Revision 3

EC-E93-003, “Voltage at Motor Operated Valves," Revision 1

EC-M84-001, “Tank Volume vs. Level Tables," Revision 6

MN(Q)-3-5, “Flooding Analysis Outside Containment," Revision 3

Design Criteria

W3-DBD-011, “Electrical Distribution (AC Portion)," Revision 11

W3-DBD-037, “Essential Chilled Water System," Revision 1

W3-DBD-008, “Electrical Distribution (DC Portion)," Revision 1

Drawings

G853 S03, "HVAC - Chilled Water Flow Diagram SH-1," Revision 21

G853 S04, "HVAC - Chilled Water Flow Diagram SH-2," Revision 16

G853 S05, "HVAC - Chilled Water Flow Diagram SH-3," Revision 15

1564-4775, “Emerg. Diesel Gen “B” Gen Controls Critical Prot. Relaying," Revision 12

5817-9399, “ Emer. Diesel Gen “A” Starting Sequence CWD Sht. 1," Revision 1

5817-9400 “Control Schematic (Starting Sequence Control)," Revision 2

5817-9401, “ Emer. Diesel Gen “A” Starting Sequence Description," Revision 1

5817-9402, “ Emer. Diesel Gen “A” Starting Sequence Description," Revision 1

5817-9520, “ Emer. Diesel Gen “A” Starting Sequence CWD Sht. 2," Revision 5

B 289 Sheet 61, “Power Distribution and Motor Data 480V MCC 3A311-S One Line Diagram," Revision 17

B 289 Sheet 65, “Power Distribution and Motor Data 480V MCC 3B311-S One Line Diagram," Revision 14

B 289 Sheet 69, “Power Distribution and Motor Data 480V MCC 3AB311-S One Line Diagram," Revision 18

G173, Sh. 1 of 3, “Flow Diagram Sump Pump System Turbine Building & Yard," Revision 39

G173, Sh. 2 of 3, “Flow Diagram Sump Pump System Reactor Auxiliary Building," Revision 6

G173, Sh. 3 of 3, “Flow Diagram Sump Pump System," Revision 12

G285, “Main One Line Diagram," Revision 15

G286, “Key Auxiliary One Line Diagram," Revision 16

G287, “125VDC and 120VAC One Line Diagram," Revision 19

G5-553-110 Sh 6 of 16, “Control Schematic (Engine Governor Control)," Revision 5

LOU-1564 B-288, Sheet 35, “Cable and Conduit List Installation Notes Instructions for 5 &15KV Splices," Revision 4

LOU-1564 B-288, Sheet 36, “Cable and Conduit List Installation Details Splice Terminations," Revision 3

LOU-1564 B-288, Sheet 37, “Cable and Conduit List Installation Details Splice Terminations," Revision 3

LOU-1564 B-289, Sheet 16-1, “Power Distribution and Power Data 4.16 KV SWGR 3B3-s One Line Diagram," Revision 8

LOU-1564 B-424, Sheet 2317S, “Control Wiring Diagram Diesel Generator A Generator Control Interface Sh. 3," Revision 8

LOU-1564 B-424, Sheet 2318S, “Control Wiring Diagram Diesel Generator A Engine Control Interface Sh. 3," Revision 8

LOU-1564 B-424, Sheet 2377S, “Control Wiring Diagram Diesel Generator B Breaker," Revision 16

LOU-1564 B-424, Sheet 1065, “Control Wiring Diagram Water Chiller Compressor WC-1 (3C-SAB)," Revision 5

LOU-1564 B-424, Sheet 1065S, “Control Wiring Diagram Water Chiller Compressor WC-1 (3C-SAB)," Revision 18

LOU-1564 B-424, Sheet 1070S, “Control Wiring Diagram Chilled Water System AB Alarm & Computer Inputs," Revision 12

LOU-1564 B-424 Sheet E2341, “Control Wiring Diagram Sequencer A Sh. 1," Revision 2

LOU-1564 B-424 Sheet E2342, “Control Wiring Diagram Sequencer A Sh. 2," Revision 2

LOU-1564 B-424 Sheet 2343S, “Control Wiring Diagram Sequencer A Sh. 3," Revision 8

LOU-1564 B-424 Sheet E2343, “Control Wiring Diagram Sequencer A Sh. 3," Revision 3

LOU-1564 B-424 Sheet 2491, “480V Bus 3A32 Undervoltage Relays," Revision 15

LOU-1564 B-424 Sheet 2337S, “4.16KV Bus 3A3-S Undervoltage Relays Sheet 1," Revision 13

LOU-1564 B-424 Sheet 2338S, “4.16KV Bus 3A3-S Undervoltage Relays Sheet 2," Revision 8

Miscellaneous Documents

Ingersoll-Rand Pump Curve for Chilled Water Pump B, June 18, 1993

Component Cooling Water Flow Balance Results Train A & B, RF-8,9,10,11

Auxiliary Component Cooling Water Flow Balance Results Train A & B, RF-8,9,10,11

"Emergency Diesel Generator and Automatic Load Sequencer Design Basis Document," August 1995

"Essential Chilled Water System Design Basis Document," Revision 1

"Strategic Component Cooling Water Plan," September 2001

PROC-MISC-902, “Fuel, Diesel, Emergency Diesel Generator, Auxiliary and Fire Pump Engines," Revision 6

Ebasco 213-71, “Station Battery Charger," Revision 1

DES-E-029, “Static Un-interruptible Power Supply," Revision 2

ASTM Standard D 4868, “Standard Test Method for Estimation of Net and Gross Heat of Combustion of Burner and Diesel Fuels," 1990 (Reapproved 1995)

Report on Waterford 3 Steam Electric Station Offsite Study, approved 4/6/02

System Performance Indicators, Chilled Water-Waterford, dated 3/13/03

System Performance Indicators, Refrigeration (Essential Chillers)-Waterford, dated 3/13/03

System Performance Indicators, Emergency Diesel Generator-Waterford, dated 3/13/03

Inter-Office Correspondence W3C1-2002-0011, note to file from Nasser Pzooki, dated August 29, 2002

Letter ILN: 00-0016, from the NRC to Entergy Operations, dated February 15, 2000

Letter W3F1-2000-0139, from Entergy Operations to the NRC, dated October 13, 2000

STP-0117749, "Uncertainty Analysis, Oil Properties, STER Heat Exchanger Performance Software Analyses," dated February 8, 1999

Updated Final Safety Analysis Report, Revision 12-A

Waterford 3 Technical Specifications, Section 3/4/8.1, "A.C. Sources," Amendment 166

Work Authorization WA# 01174044, Task# 015153, completed September 11, 1998

Technical Specifications

3/4.7.12 "Essential Services Chilled Water System."

3/4.8 "Electrical Power Systems."