



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

March 29, 2004

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

**SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - NRC INTEGRATED
INSPECTION REPORT 05000382/2004002**

Dear Mr. Venable:

On March 23, 2004, the NRC completed an inspection at your Waterford Steam Electric Station, Unit 3. The enclosed report documents the inspection findings which were discussed on March 22, 2004, with you 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.

Based on the results of this inspection, the NRC has identified four issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that violations are associated with these issues. These violations are being treated as noncited violations (NCVs), consistent with Section VI.A of the Enforcement Policy. These NCVs are described in the subject inspection report. If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Waterford Steam Electric Station, Unit 3 facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made 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).

Entergy Operations, Inc.

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Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

William B. Jones, Chief
Project Branch E
Division of Reactor Projects

Docket: 50-382
License: NPF-38

Enclosures:
NRC Inspection Report
050000382/2004002

w/attachment: Supplemental Information

cc w/enclosure(s):
Senior Vice President and
Chief Operating Officer
Entergy Operations, Inc.
P.O. Box 31995
Jackson, Mississippi 39286-1995

Vice President, Operations Support
Entergy Operations, Inc.
P.O. Box 31995
Jackson, Mississippi 39286-1995

Wise, Carter, Child & Caraway
P.O. Box 651
Jackson, Mississippi 39205

General Manager, Plant Operations
Waterford 3 SES
Entergy Operations, Inc.
17265 River Road
Killona, Louisiana 70066-0751

Manager - Licensing Manager
Waterford 3 SES
Entergy Operations, Inc.
17265 River Road
Killona, Louisiana 70066-0751

Entergy Operations, Inc.

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Chairman
Louisiana Public Service Commission
P.O. Box 91154
Baton Rouge, Louisiana 70821-9154

Director, Nuclear Safety &
Regulatory Affairs
Waterford 3 SES
Entergy Operations, Inc.
17265 River Road
Killona, Louisiana 70066-0751

Michael E. Henry, State Liaison Officer
Department of Environmental Quality
Permits Division
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

Parish President
St. Charles Parish
P.O. Box 302
Hahnville, Louisiana 70057

Winston & Strawn
1400 L Street, N.W.
Washington, D.C. 20005-3502

Technological Services Branch Chief
National Preparedness Division
FEMA Region VI
800 North Loop 288
Federal Regional Center
Denton, Texas 76201-3698

Electronic distribution by RIV:
 Regional Administrator (**BSM1M**)
 DRP Director (**ATH**)
 DRS Director (**DDC**)
 Senior Resident Inspector (**MCH**)
 Branch Chief, DRP/E (**WBJ**)
 Senior Project Engineer, DRP/E (**VGG**)
 Staff Chief, DRP/TSS (**PHH**)
 RITS Coordinator (**KEG**)
 Rebecca Tadesse, OEDO RIV Coordinator (**RXT**)
 WAT Site Secretary (**AHY**)
 EPPO (**JDA1**)

ADAMS: Yes No Initials: __WBJ__
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| 3/26/04 | 3/26/04 | 3/25/04 | 3/29/04 | 3/25/04 | NA |

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| LJSmith | WBJones | | |
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 50-382
License No.: NPF-38
Report No.: 05000382/2004002
Licensee: Entergy Operations, Inc.
Facility: Waterford Steam Electric Station, Unit 3
Location: Hwy. 18
Killona, Louisiana
Dates: January 1 through March 23, 2004
Inspectors: M. C. Hay, Senior Resident Inspector
G. F. Larkin, Resident Inspector
P. J. Elkmann, Emergency Preparedness Inspector
Accompanying
Personnel: D. D. Duvigneaud, Intern, NRC Headquarters
Approved By: W. B. Jones, Chief, Project Branch E
ATTACHMENTS: Supplemental Information

Enclosure

SUMMARY OF FINDINGS

IR 05000382/2004002; 01/01-03/23/2004; Waterford Steam Electric Station, Unit 3; Equipment Alignment, Operability Evaluations, Identification and Resolution of Problems.

The report covered a 12-week period of inspection by resident inspectors and a regional emergency preparedness inspector. The inspection identified four Green findings. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the Significance Determination Process does not apply may be Green or be assigned a severity level after NRC management review. 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.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to maintain design control of the emergency diesel generating system fuel oil storage requirements. This failure affected the ability of each emergency diesel generator to provide sufficient fuel oil to support 7 days of continuous diesel generator operations following a loss of offsite power and a design-bases accident.

This finding was greater than minor because it affected the mitigating systems cornerstone objective of ensuring the capability of emergency ac power to respond to initiating events to prevent undesirable consequences. This finding was evaluated using NRC Manual Chapter 0609, Significance Determination Process, Phase 1 worksheet under the mitigating systems cornerstone. The finding was determined to be of very low safety significance because the design deficiency was confirmed not to result in a loss of function per Generic Letter 91-18, Revision 1 (Section 1R15).

Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to promptly identify and correct a condition adverse to quality. Specifically, the licensee inappropriately closed a corrective action requiring revisions to the emergency diesel generator loading and fuel oil consumption analysis. The failure to adequately complete this corrective action resulted in the failure to maintain design control of the emergency diesel generator fuel oil storage inventory requirements to ensure a 7-day post accident fuel oil inventory.

This finding was greater than minor because it affected the mitigating systems cornerstone objective of ensuring the capability of emergency ac power to respond to initiating events to prevent undesirable consequences. This finding was evaluated using NRC Manual Chapter 0609, Significance Determination Process, Phase 1 worksheet under the mitigating systems cornerstone. The finding was determined to be of very low safety significance because the design deficiency was confirmed not to result in a loss of function per Generic Letter 91-18, Revision 1 (Section 4OA2).

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Cornerstone: Barrier Integrity

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI was identified for the failure to promptly identify and correct a condition adverse to quality. Specifically, Entergy failed to replace known age-degraded O-rings affecting the main feedwater isolation valves in the year 2000 resulting in O-ring failure and inoperability of the Train A feedwater isolation valve on December 27, 2003.

The finding was greater than minor because it affected the reactor safety barrier integrity cornerstone for providing reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was only of very low safety significance because it did not represent an actual reduction of the atmospheric pressure control function of the reactor containment, it did not result in an actual open pathway affecting the physical integrity of reactor containment, and the main feedwater isolation valves were inoperable for less time than the allowed Technical Specification outage time (Section 1R04.2.1).

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the failure to establish appropriate instructions for corrective maintenance activities on Train A main feedwater isolation valve on December 27, 2003. This resulted in the failure to establish appropriate torque specifications to ensure adequate O-ring compression that ultimately led to an O-ring failure and inoperability of the isolation valve on January 3, 2004.

The finding was greater than minor because it affected the reactor safety barrier integrity cornerstone for providing reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was only of very low safety significance because it did not represent an actual reduction of the atmospheric pressure control function of the reactor containment, it did not result in an actual open pathway affecting the physical integrity of reactor containment, and the main feedwater isolation valves were inoperable for less time than the allowed Technical Specification outage time (Section 1R04.2.2).

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status: The plant was operated at approximately 100 percent power from January 1 through February 16, 2004. Power was reduced to approximately 88 percent late on February 17, 2004, to conduct high pressure turbine valve testing. Power was restored to 100 percent on February 18. On February 20, 2004, power was reduced to approximately 20 percent following a hydraulic fluid leak on a low pressure turbine reheat steam valve that resulted in a manual turbine trip. Following valve repairs reactor power was restored to 100 percent on February 20, 2004. Reactor power was maintained at approximately 100 percent throughout the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

The inspectors performed an inspection of Entergy's design basis analysis for a tornado event. A walkdown of components and systems susceptible to tornado damage, using Procedure OP-903-521, "Severe Weather and Flooding," Revision 3, was performed. The inspection included a review of weather related condition reports, building and system design calculations, Chapter 3.3 of the Final Safety Analysis Report, and discussions with various licensee personnel concerning tornado preparations.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial System Walkdowns

a. Inspection Scope

The inspectors performed the following three partial system equipment alignment inspections during this inspection period:

- On February 9, 2004, the inspectors walked down the accessible electrical and mechanical portions of low pressure safety injection system Train B. The walkdown was completed while low pressure safety injection system Train A was unavailable due to a planned system outage. The inspectors performed the walkdown using Procedure OP-009-008, "Safety Injection System," Revision 16.
- On March 9, 2004, the inspectors walked down the accessible electrical portions of the 4160 VAC system Train B while offsite power was deenergized

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due to a planned system outage on switch-yard Line A. The inspectors performed the walkdown using Operating Procedure OP-903-066, "Electrical Breaker Alignment Check," Revision 7.

- On March 17, 2004, the inspectors performed a partial equipment alignment inspection of the emergency feedwater system Train B while emergency feedwater system Train A was inoperable. A review of select maintenance work orders and corrective action documents was performed to assess the material condition and performance of the system. System configuration was assessed using Operating Procedure OP-009-003, "Emergency Feedwater," Revision 11. A walkdown of accessible portions of the system was performed to assess material condition, such as system leaks and housekeeping issues, that could adversely affect system operability.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdowns

a. Inspection Scope

The inspectors performed a complete alignment inspection of the main feedwater isolation valve actuator and control systems. A walkdown of the mechanical and electrical components in the system was performed to verify that the system was configured and operated in accordance with operating procedures. The inspectors reviewed the system design requirements in the Updated Final Safety Analysis Report to verify the system's ability to provide containment isolation was adequate. The inspectors reviewed applicable design documentation and select condition reports to verify that degraded conditions were identified at the appropriate threshold and that corrective actions were adequate and implemented in a timely manner.

b. Findings

.1 Inadequate Corrective Action Affecting Main Feedwater Isolation Valve

Introduction. A Green self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI was identified for the failure to promptly identify and correct a condition adverse to quality. Specifically, Entergy failed to replace known age-degraded O-rings affecting the main feedwater isolation valves in the year 2000 resulting in O-ring failure and inoperability of the Train A feedwater isolation valve on December 27, 2003.

Description. Condition Report CR-WF3-2000-00628, initiated on June 12, 2000, identified that hydraulic fluid leakage from the main feedwater isolation valve actuators was a result of the failure to replace O-rings that were susceptible to age-related degradation. A corrective action was initiated to replace all O-rings at the vendor

recommended frequency. This corrective action was not completed as assigned and the corrective action was inappropriately closed. Subsequently, on December 27, 2003, main feedwater isolation valve Train A was declared inoperable due to a failed O-ring that resulted in a loss of actuator hydraulic fluid. This condition prevented the valve from performing its design-basis isolation function.

Analysis. The deficiency associated with this finding was the failure to promptly identify and correct a condition adverse to quality. Specifically, corrective actions established to address age-related degradation of components affecting the operability of main feedwater isolation valve Train A were not adequately implemented resulting in component failure. The finding was greater than minor because it affected the reactor safety barrier integrity cornerstone for providing reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was only of very low safety significance because it did not represent an actual reduction of the atmospheric pressure control function of the reactor containment; it did not result in an actual open pathway affecting the physical integrity of reactor containment; and the main feedwater isolation valves were inoperable for less time than the allowed Technical Specification outage time.

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. The failure to replace age-degraded components on main feedwater isolation valve Train A, that resulted in the component failure on December 27, 2003, is a violation of 10 CFR Part 50, Appendix B, Criterion XVI. Because the failure to promptly identify and correct a condition adverse to quality was of very low safety significance and has been entered into Entergy's corrective action program as Condition Reports 2003-3997 and 2004-0104, this violation is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-382/2004002-01, Inadequate Corrective Action Affecting Main Feedwater Isolation Valve.

.2 Inadequate Maintenance Instructions Affecting Main Feedwater Isolation Valve

Introduction. A Green self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the failure to establish appropriate instructions for corrective maintenance activities on main feedwater isolation valve Train A on December 27, 2003. This resulted in the failure to establish appropriate torque specifications to ensure adequate O-ring compression that ultimately led to an O-ring failure and inoperability of the isolation valve on January 3, 2004.

Description. On January 3, 2004, main feedwater isolation valve Train A was declared inoperable due to loss of actuator hydraulic pressure. The licensee determined that an O-ring that had been replaced on a flow control valve December 27, 2003, had failed, resulting in loss of hydraulic fluid. Investigation of the failure revealed that the maintenance instructions failed to include the torque specifications required to

adequately compress the O-ring to prevent extrusion. This resulted in inadequate compression and extrusion of the O-ring causing loss of the hydraulic fluid pressure boundary.

Investigation into this issue revealed that Entergy had previously identified concerns related to inadequate work instructions for performing maintenance activities on the main feedwater isolation valves. Condition Report CR-WF3-2002-00624, initiated on March 2, 2002, documented that the apparent cause for the inadequate work instructions was attributed to changing from a vendor performing maintenance activities on the feedwater isolation valves to Entergy maintenance personnel. Corrective Action No. 4 documented that the component engineering department was assigned to determine if an operation and maintenance manual for the feedwater isolation valves was required and, if so, obtain one and incorporate the document into the vendor technical manual. The component engineering department identified that such a manual existed. This manual was Electric Power Research Institute Document NP-7212 entitled "Main Feedwater Isolation Valve Maintenance Guide." Entergy documented that Document NP-7212 would be incorporated into the vendor technical manual. This corrective action was subsequently closed on August 8, 2002, however, the corrective action was never completed as assigned. The inspectors determined that the failure to implement assigned corrective actions was a performance deficiency associated with the problem identification and resolution program.

Analysis. The deficiency associated with this finding was the failure to establish appropriate instructions for corrective maintenance activities on main feedwater isolation valve Train A on December 27, 2003. This resulted in the failure to establish appropriate torque specifications to ensure adequate O-ring compression that ultimately led to an O-ring failure and inoperability of the isolation valve on January 3, 2004. A contributing factor that resulted in the inadequate work instruction was Entergy's failure to adequately implement an assigned corrective action. The finding was greater than minor because it affected the reactor safety barrier integrity cornerstone for providing reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was only of very low safety significance because it did not represent an actual reduction of the atmospheric pressure control function of the reactor containment; it did not result in an actual open pathway affecting the physical integrity of reactor containment; and the main feedwater isolation valves were inoperable for less time than the allowed Technical Specification outage time.

Enforcement. 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances." The failure to establish appropriate instructions for corrective maintenance activities on Train A main feedwater isolation valve resulting in failure of the isolation valve on January 3, 2004, is a violation of 10 CFR Part 50, Appendix B, Criterion V. Because this finding is of very low safety significance and has been entered into Entergy's corrective action program as Condition Reports CR-WF3-2004-0403 and

CR-WF3-2004-0016, this violation is being treated as a noncited violation consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000382/2004002-02, Inadequate Maintenance Instructions Affecting Main Feedwater Isolation Valve.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors conducted six inspections to assess whether Entergy had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capabilities, and maintained passive fire protection features in good material condition.

The following areas were inspected:

- Fire Zone RAB 2, 5, 15, 16 and 23 on January 13, 2004
- Fire Zone RAB 15, 16, 17, 18, 19, 20, 33, 35 and 36 on January 29, 2004
- Fire Zone RAB 1A, 1B, 1C, 3 and 8A on February 17, 2004
- Fire Zone RAB 2, 31, Dry Cooling Tower A and B, and Wet Cooling Tower A and B on February 24, 2004
- Fire Zone RAB 1A, 5, 6, 7, 8, 11, 12 and 13 on March 8, 2004
- Fire Zone RAB 15, 16, 17, 18, 19, 20, 33, 35, and 36 on March 23, 2004

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On February 3, 2004, the inspectors observed a licensed operator simulator training examination. During the examination, the inspectors evaluated the operator's ability to recognize, diagnose, and respond to failed instruments (ENI Log Channel A and Steam Generator Number 1 level), a failed component cooling water pump, a steam generator tube rupture, and a main steam line break. The inspectors observed and evaluated the following areas:

- Understanding and interpreting annunciator and alarm signals
- Diagnosing events and conditions based on signals or readings
- Understanding plant systems

- Use and adherence of Technical Specifications
- Crew communications including command and control
- The crew's and evaluator's critiques

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

During the inspection period, the inspectors reviewed Entergy's implementation of the Maintenance Rule. The inspectors considered the characterization, safety significance, performance criteria, and the appropriateness of goals and corrective actions. The inspectors assessed Entergy's implementation of the Maintenance Rule to the requirements outlined in 10 CFR 50.65 and Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2. The inspectors reviewed the following two Maintenance Rule scoped systems, structures, or components that displayed performance problems:

- Emergency diesel generator (EDG) Train A
- Reactor coolant system

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors reviewed risk assessments for planned or emergent maintenance activities to determine if Entergy met the requirements of 10 CFR 50.65(a)(4) for assessing and managing any increase in risk from these activities. The following five risk evaluations were reviewed:

- From January 26-27, 2004, during emergent repairs on auxiliary component cooling water pump Train B
- On February 2, 2004, during emergent repairs on EDG Train B
- On February 13, 2004, during emergent repairs on atmospheric dump valve Train B
- On March 4, 2004, during maintenance activities on reactor trip circuit breaker

Number 7

- On March 9, 2004, during maintenance activities on Switchyard Line A

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions (71111.14)

a. Inspection Scope

For the nonroutine events described below, the inspectors reviewed operator logs, plant computer data, and strip charts to determine what occurred, how the operators responded, and whether the response was in accordance with plant procedures.

- On February 19, 2004, operators performed a reactor downpower to 20 percent and manually tripped the main turbine in response to a hydraulic leak affecting main steam reheat Valve RS-201C.
- On February 13, 2004, operators reduced main turbine loading and isolated atmospheric dump valve Number 2 in response to the dump valve failing in the open position. Prior to operators reducing load on the main turbine, a brief reactor power excursion to approximately 101.9 percent was experienced.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the technical adequacy of four operability evaluations to verify that they were sufficient to justify continued operation of a system or component. The inspectors considered that, although equipment was potentially degraded, the operability evaluation provided adequate justification that the equipment could still meet its Technical Specification, Updated Final Safety Analysis Report, and design-bases requirements and that the potential risk increase contributed by the degraded equipment was thoroughly evaluated. The following evaluations were reviewed:

- Operability evaluation addressing the failure to analyze the impact of EDG fuel consumption following a temperature setpoint change of the wet cooling tower Fans 5-8 (Condition Report CR-WF3-2003-02758)
- Operability evaluation addressing the failure to incorporate the appropriate

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low-pressure safety injection pump horsepower in the EDG loading and fuel oil consumption analysis (Condition Report CR-WF3-2003-02872)

- Operability evaluation addressing three additional inconsistencies affecting the EDG loading and fuel oil consumption analysis (Condition Report CR-WF3-2003-03088)
- Operability evaluation addressing component cooling water make-up requirements to the EDG Train A jacket water standpipe (Condition Report CR-WF3-2004-0053)

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to maintain design control of the emergency diesel generating (EDG) system fuel oil storage requirements. This failure affected the ability of each EDG to provide sufficient fuel oil to support 7 days of continuous diesel generator operations following a loss of offsite power and a design-bases accident.

Description. On September 29, 2003, Entergy initiated Condition Report CR-WF3-2003-02758 after identifying they had failed to analyze the impact on the EDG fuel consumption analysis following a temperature setpoint change of wet cooling tower Fans 5-8. This discrepancy added approximately 135 gallons of fuel oil consumed by each diesel over the 7-day period. A review of Engineering Calculation EC-E90-006, "EDG Loading and Fuel Oil Consumption," indicated that this additional fuel usage resulted in a margin of 150 gallons. Entergy is required by Technical Specification 3.8.1.1 to maintain a minimum of 38,760 gallons of fuel oil in the fuel oil storage tanks to support 7 days of continuous EDG operations following a loss of offsite power and a design-bases accident.

On October 9, 2003, Entergy initiated Condition Report CR-WF3-2003-02872 after identifying the EDG fuel oil consumption analysis improperly assumed that the low-pressure safety injection pump motors were rated at 390 horsepower. The nameplate horsepower for these motors was 500 horsepower. This discrepancy resulted in approximately 147 additional gallons of fuel oil consumed by each diesel. Entergy determined that the EDGs remained operable based on 3 gallons of margin that existed from the Technical Specification requirement of 38,760 gallons.

The inspectors reviewed Engineering Calculation EC-M84-001, "Tank Volume vs. Level Tables," Revision 6, and noted that Section 5.2.5 stated, "The volume of internal structures inside the tank were considered negligible unless these structures were found to be of substantial significance (greater than 0.5 percent of total volume)." The inspectors questioned Entergy personnel if EDG fuel oil storage tank internal structures were evaluated as a potential operability impact since the 3-gallon margin accounted for approximately 0.008% of the total required volume of fuel oil. After reviewing design drawings and discussions with the fuel oil storage tank vendor, Entergy determined that

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approximately 67 gallons of fuel oil would be displaced due to internal tank structures. The inspectors determined that the failure to perform an adequate extent of condition review after identifying that the fuel oil margin was minimal was a performance deficiency associated with the problem identification and resolution program. Entergy documented this design control deficiency into their corrective action process in Condition Report CR-WF3-2004-00420.

On October 24, 2003, Entergy initiated Condition Report CR-WF3-2003-03088 after identifying the EDG fuel oil consumption analysis failed to properly account for three additional discrepancies. These discrepancies resulted in an additional fuel oil consumption of 65, 276, and 1616 gallons respectively, for a total of 1957 gallons of fuel oil consumed by each diesel. The inspectors noted that Entergy determined the EDGs remained operable based on conservatism contained in the calculation resulting in a consumption reduction of 2,688 gallons of fuel oil. The inspectors noted that one conservatism assumed by the licensee was that Engineering Calculation EC-M84-001 assumed a theoretical EDG fuel oil consumption rate of 5.1293 gpm when the diesel was fully loaded. The licensee determined that actual consumption rate of fuel oil for a fully loaded diesel was 4.9 gpm based on historical data maintained by system engineering. Entergy determined that the 4.9 gpm consumption rate resulted in a fuel oil consumption reduction of 1,733 gallons by each diesel.

The inspectors reviewed Engineering Calculation EC-M84-001 and noted that the diesel generator vendor provided Entergy with the fuel consumption data obtained from testing their diesel engines. This testing established the basis for establishing that each diesel engine consumed 5.1293 gpm of fuel oil when fully loaded. The inspectors requested to review the documentation that was maintained to support the assumption that 4.9 gpm fuel consumption was reasonable. The inspectors were concerned that the appropriate quality controls were not maintained in developing the consumption rate resulting in the failure to adequately bound all design-basis accident conditions. Following these discussions Entergy withdrew the 4.9 gpm assumption and initiated Condition Report CR-WF3-2004-00494. Entergy implemented immediate corrective actions that consisted of increasing the required volume in the fuel oil storage tanks in order to ensure a 7-day postaccident fuel oil inventory was maintained.

Analysis. The deficiency associated with this finding was the failure to maintain design control of the EDG fuel oil storage requirements to ensure a 7-day postaccident fuel oil inventory was maintained. Contributing factors for the failure to maintain design control of the fuel oil inventory requirements included a deficiency associated with Entergy's corrective action program. Specifically, the licensee had failed to adequately evaluate the full extent of a degraded condition. This finding was greater than minor because it affected the mitigating systems cornerstone objective of ensuring the capability of the emergency ac power to respond to initiating events to prevent undesirable consequences. This finding was evaluated using NRC Manual Chapter 0609, Significance Determination Process, Phase 1 worksheet under the mitigating systems cornerstone. The finding was determined to be of very low safety significance because the design deficiency was confirmed not to result in a loss of function per Generic

Letter 91-18, Revision 1. In addition, the inspectors noted that replenishment of fuel oil is addressed in the Safety Evaluation Report (SER), related to Amendment 157 to revise final safety analysis report (FSAR) Section 9.5.4, "Diesel Generator Fuel Oil Storage and Transfer Systems," that provided relief of the 10 percent margin for the time dependent load calculations. The SER states that Entergy maintains additional diesel fuel oil onsite and replenishing the fuel oil via tanker truck, train, or barge is readily available based on the site being located in a heavy industrial corridor of Louisiana where there are many oil refineries and oil storage facilities.

Enforcement. 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that measures be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. The failure to maintain design control of the EDG fuel oil storage inventory requirements to ensure a 7-day postaccident fuel oil inventory was maintained is a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." Because the failure to maintain design control of the fuel oil storage system was of very low safety significance and has been entered into the licensee's corrective action program as Condition Reports CR-WF3-2004-00494 and -00420, this violation is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000382/2004002-03, Inadequate Design Control of the Diesel Generator Fuel Oil Storage Requirements.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors performed a review of operator workarounds. This review evaluated the individual and cumulative effects of operator workarounds during this inspection period to assess the associated impact affecting the operator's ability to respond in a correct and timely manner to plant transients and accidents.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

The inspectors reviewed a permanent plant modification of the feedwater system to ensure that the modification did not adversely affect system operability or design requirements specified in the Final Safety Analysis Report and Technical Specifications. The modification was installed on the main feedwater isolation valve to maintain a positive closing force on the valve stem when the valve was in the closed position to prevent a possible condition where the main feedwater isolation valve could drift open. The inspectors reviewed the following documentation during this inspection activity:

- Engineering Request W3-2002-0408-000, "Maintaining Closing Force for MFIV," Revision 1
- Waterford 3 Final Safety Analysis Report, Chapter 10.4.7, "Condensate and Feedwater System"
- Nuclear Maintenance Applications Center Manual, NP-7212, "Main Feedwater Isolation Valve Maintenance Guide," Revision 0

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed postmaintenance tests to verify system operability and functional capabilities. The inspectors considered whether testing met design and licensing bases, Technical Specifications, and Entergy's procedural requirements. The inspectors reviewed the testing results for the following six components:

- Charging Pump B pulsation dampener, following a failed tubing line associated with the nitrogen bladder fill valve on December 26, 2003
- Train B emergency diesel generator, following a failed reverse power trip on January 5, 2004
- Train B emergency diesel generator, following a failure of the incomplete starting sequence relay on February 2, 2004
- Train B main feedwater isolation valve actuating system leak tests performed after system over pressurization on February 20, 2004
- Emergency feedwater Pump A/B, following speed governor adjustments on November 19, 2004
- Atmospheric dump Valve MS-116B, following a pressure loop set point failure that caused the valve to fail full open on February 13, 2004

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed or reviewed the following six surveillance tests to ensure the systems were capable of performing their safety function and to assess their operational readiness. Specifically, the inspectors considered whether the following surveillance tests met Technical Specifications, the Updated Final Safety Analysis Report, and Entergy's procedural requirements:

- Surveillance Procedure OP-903-068, "Emergency Diesel Generator and Subgroup Relay Operability Verification," Revision 13, performed on January 5, 2004. This surveillance tested the functional capability of Train B emergency diesel generator to start and load and the functional capability of a select group of engineered safety features actuation system subgroup relays that can be tested during power operations.
- Surveillance Procedure ME-003-318, "G.E. Undervoltage Relay Model 12IAV55C," Revision 9, performed on January 13, 2004. This surveillance tested the operability of the undervoltage relays for the Train A 4.16KV safety bus.
- Surveillance Procedure MI-003-376, "Containment Atmosphere Radiation Monitor Channel Functional Test PRMIR0100Y," Revision 4, performed on January 16, 2004. This surveillance tested the operability of the containment atmosphere particulate, iodine, and gaseous radiation monitor.
- Surveillance Procedure OP-903-115, "Train A Integrated Emergency Diesel Generator/Engineering Safety Features Test," Revision 8, performed on January 26, 2004. This surveillance tested the ability of Train A emergency diesel fuel oil transfer pump to transfer fuel oil from Emergency Diesel Fuel Oil Storage Tank B to Emergency Diesel Fuel Oil Day Tank A.
- Surveillance Procedure OP-903-117, "Emergency Diesel Generator Fuel Oil Transfer Pump Operability Check," Revision 4, performed on January 26, 2004. This surveillance tested the ability of Train A emergency diesel fuel oil transfer pump to transfer fuel oil from Emergency Diesel Fuel Oil Storage Tank A to Emergency Diesel Fuel Oil Day Tank A.
- Surveillance Procedure OP-903-046, "Emergency Feedwater Pump Operability Check," Revision 15, performed on March 3, 2004. This surveillance tested the operability of the steam turbine driven emergency feedwater pump.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

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1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspector performed an in-office review of Revision 30 to the Waterford 3 Steam Electric Station Emergency Plan, submitted January 20, 2004. This revision: (1) updated titles of state agencies, (2) added two offsite notification sirens, (3) updated the population in the 50-mile Emergency Planning Zone based on the 2000 Census, and (4) updated references to company vendors. This revision was compared to its previous revision and to the requirements of 10 CFR 50.47(b) and 50.54(q) to determine if the revision decreased the effectiveness of the plan. The inspector completed one sample during this inspection.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

On March 11, 2004, the inspectors reviewed the drill scenario and observed activities in the simulated control room, the emergency operations facility, the Technical Support Center, and the Operations Support Center. The drill scenario simulated equipment failures, a site evacuation, a reactor core transient with leakage of reactor coolant, and the release of radioactive material offsite. The inspectors evaluated performance by focusing on the risk-significant activities of emergence classification, notification and protective action recommendations. In addition, the inspectors reviewed the drill critiques and the resolution of identified performance weaknesses.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors reviewed licensee submittals for the performance indicators listed below for the period from the fourth quarter of 2002 through the fourth quarter of 2003. To verify the accuracy of the performance indicator data reported during that period, performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 2, was utilized.

Initiating Events Cornerstone

- Scrams With Loss of Normal Heat Removal
- Unplanned Power Changes

Mitigating Systems

- Emergency AC Power System Unavailability

b. Findings

Introduction. The inspectors identified a potential error concerning the Emergency AC Power System Unavailability performance indicator. The resolution of this item is pending a response from NRC Headquarters and is therefore being considered an unresolved item (URI).

Description. The inspectors reviewed Entergy's performance indicator data for Safety System Unavailability for Train A Emergency AC Power and noted that no fault exposure hours for the second and third quarters of 2003 were recorded.

On September 29, 2003, during performance of a monthly surveillance run at Waterford 3, the Train A emergency diesel generator experienced a fuel line failure that rendered the diesel unable to perform its safety function. The licensee's root cause analysis determined that in May 2003, during overhaul of the diesel, the fuel line had been improperly attached at a swagelock fitting connection. Laboratory analysis concluded that improper alignment of the tubing in the compression fitting and over tightening of the fitting resulted in uneven and excessive scoring of the tubing resulting in fatigue failure of the tubing after approximately 28.7 hours of diesel operation.

NRC Inspection Report 05000382/2003007 documented the performance deficiency as a potential violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to establish appropriate instructions and accomplish those instructions for proper installation of the fuel line. The significance determination associated with this performance deficiency, assessed by Entergy and the NRC, were based on the licensee's root cause evaluation that determined the time of failure of the fuel line was based on run time of the diesel. This was utilized since fatigue stresses on the improperly applied connection were only present during diesel operations.

The inspectors noted Entergy assumed the time of failure was not known, with respect to reporting the performance indicator data, and therefore assumed the T/2 fault exposure criteria was applicable. NEI 99-02 guidance states the definition of T/2 fault exposure hours as, "The hours that a train was in an undetected, failed condition and the time of failure cannot be determined." The inspectors noted that T/2 fault exposure hours are not counted against unplanned unavailable hours since time of failure is not known. The inspectors noted this assumption contradicted Entergy's root cause

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analysis and the method by which the risk significance of the degraded condition was being assessed. Both the root cause analysis and the risk significance assessment stated that time of failure was known based on a fatigue failure mechanism present during diesel operation.

The inspectors determined that Entergy potentially failed to interpret NEI 99-02 guidance appropriately resulting in the failure to accurately report Safety System Unavailability Hours for Train A Emergency AC Power. NEI 99-02 guidance states the definition of fault exposure hours as, "The failure's time of occurrence and its time of discovery are known. Examples of this type of failure include damage caused during maintenance activities. For these cases, the fault exposure hours are the lapsed time between the occurrence of a failure and its time of discovery. These hours are reported as fault exposure hours and included in the calculation of safety system unavailability." The inspectors noted that if fault exposure hours were recorded assuming time of failure was known as used in the risk significance determination assessment and supported by the licensee's root cause analysis, then the total unavailable hours recorded would be approximately 3273 hours from May 16, 2003, through September 30, 2003, during which the assessed available time of the EDG was less than the 24 hour mission time. The licensee actually reported 21.64 total unavailable hours for the same time period using the T/2 criteria.

Analysis. The deficiency associated with this finding is a potential reporting error concerning the Emergency AC Power System Unavailability performance indicator. The magnitude of the potential error would result in a color change of the performance indicator that would be greater than Green.

Enforcement. The resolution of this item is pending a response from NRC Headquarters and is therefore being considered an unresolved item, URI 05000382/2004002-04, Potential Performance Indicator Error Affecting the Emergency AC Power System Unavailability Criteria.

40A2 Identification and Resolution of Problems (71152)

.1 Annual Sample Review

a. Inspection Scope

The inspectors reviewed the licensee's corrective actions associated with Condition Report CR-WF3-2003-03088. The report addressed the identification of three inconsistencies that affected the EDG loading and fuel oil consumption analysis.

b. Findings and Observations

Introduction. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to promptly identify and correct a condition adverse to quality. Specifically, the licensee inappropriately closed a corrective action

requiring revisions to the EDG Loading and Fuel Oil Consumption analysis. The failure to adequately complete this corrective action resulted in the failure to maintain design control of the EDG fuel oil storage inventory requirements to ensure a 7-day post accident fuel oil inventory.

Discussion. As previously discussed in Section 1R15, "Operability Evaluations," on October 24, 2003, Entergy initiated Condition Report CR-WF3-2003-03088 after identifying the EDG fuel oil consumption analysis failed to properly account for three additional discrepancies. These discrepancies resulted in an additional fuel oil consumption of 65, 276, and 1616 gallons respectively, for a total of 1957 gallons of fuel oil consumed by each diesel. Prior to the discovery of these deficiencies the margin of fuel oil for the diesels to support the 7-day post accident requirement consisted of 3 gallons.

The inspectors noted that Condition Report CR-WF3-2003-03088 stated, "This CR is closed administratively because the condition will be tracked and corrected under another approved process (Reference CR-WF3-2003-02758, Corrective Action No. 4)." Condition Report CR-WF3-2003-02758, Corrective Action No. 4 stated, in part, "Revise Calculation EC-E90-006, "EDG Loading and Fuel Oil Consumption," to include the identified corrections." The inspectors questioned Entergy if the revised analysis contained all the identified discrepancies associated with Condition Report CR-WF3-2003-03088 since it appeared to the inspectors that the analysis would not support operability of the EDGs unless the licensee had assumed a fuel oil consumption rate of 4.9 gpm. As previously discussed in Section 1R15 the inspectors identified the 4.9 gpm consumption rate was inappropriate due to the lack of adequate quality controls. The licensee stated that 5.1293 gpm fuel oil consumption rate was used in the revised calculation and they would review the calculation to determine if an error existed.

After review of the analysis the licensee determined they had failed to incorporate the discrepancy accounting for 1,616 gallons of fuel oil in the revised calculation. As previously discussed, when these deficiencies were identified the licensee immediately raised the level required to be maintained in the fuel oil storage tanks to satisfy the EDG design-basis requirements. The inspectors determined that the failure to implement assigned corrective actions was a performance deficiency associated with the problem identification and resolution program.

Analysis. The deficiency associated with this finding was the failure to promptly identify and correct a condition adverse to quality. Specifically, the licensee inappropriately closed a corrective action requiring revisions to the EDG Loading and Fuel Oil Consumption analysis. This finding was greater than minor because it affected the mitigating systems cornerstone objective of ensuring the capability of the emergency ac power to respond to initiating events to prevent undesirable consequences. This finding was evaluated using NRC Manual Chapter 0609, Significance Determination Process, Phase 1 worksheet under the mitigating systems cornerstone. The finding was determined to be of very low safety significance because the design deficiency was

confirmed not to result in a loss of function per Generic Letter 91-18, Revision 1. In addition, the inspectors noted that replenishment of fuel oil is addressed in the SER, related to Amendment 157 to revise FSAR Section 9.5.4, "Diesel Generator Fuel Oil Storage and Transfer Systems," that provided relief of the 10 percent margin for the time dependent load calculations. The SER states that Entergy maintains additional diesel fuel oil onsite and replenishing the fuel oil via tanker truck, train, or barge is readily available based on the site being located in a heavy industrial corridor of Louisiana where there are many oil refineries and oil storage facilities.

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. The failure to promptly identify and correct deficiencies associated with engineering analysis EC-E90-006, "EDG Loading and Fuel Oil Consumption," resulting in the failure to maintain design control of the EDG fuel oil storage inventory requirements to ensure a 7-day post accident fuel oil inventory, is a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Design Corrective Action." Because the failure to promptly identify and correct the engineering analysis was of very low safety significance and has been entered into the licensee's corrective action program as Condition Report CR-WF3-2004-00483, this violation is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000382/2004002-05, Failure to Promptly Identify and Correct EDG Loading and Fuel Oil Consumption Analysis Deficiencies.

.2 Cross-References to PI&R Findings Documented Elsewhere

Section 1R04.2 of the report describes two findings associated with the Train A main feedwater isolation valve. The first finding involved a failure to promptly identify and correct a condition adverse to quality. Specifically, Entergy failed to replace known age-degraded components that ultimately resulted in a Train A feedwater isolation valve failure. The second finding involved a failure to adequately implement an assigned corrective action that contributed to the failure to establish appropriate instructions for performing maintenance activities on the feedwater isolation valves. The findings were indicative of a potential deficiency in the licensee's corrective action program.

4OA6 Meetings

Exit Meeting Summary

- .1 On February 23, 2004, the emergency preparedness inspector conducted a telephonic exit interview and presented the inspection results to Mr. R. Perry, Acting Emergency Planning Manager, and other members of his staff who acknowledged the findings. The inspector confirmed that proprietary information was not provided or examined during the inspection.
- .2 The resident inspectors presented the inspection results to Mr. J. Venable, Site Vice-President and other members of Entergy's management and staff at the conclusion of

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the inspection on March 22, 2004. Entergy acknowledged the findings presented. The inspectors asked Entergy whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee Identified Violations

None.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

S. Anders, Superintendent, Plant Security
T. Brumfield, Manager, Quality Assurance
J. R. Douet, General Manager, Plant Operations
C. Fugate, Assistant Manager, Operations
T. Gaudet, Director, Planning and Scheduling
B. Houston, Manager, Radiation Protection
C. Lambert, Director, Engineering
J. Laque, Manager, Maintenance
R. Murillo, Engineer, Licensing
R. Osborne, Manager, System Engineering
K. Peters, Director, Nuclear Safety Assurance/Emergency Preparedness
G. Sen, Manager, Licensing
T. E. Tankersley, Manager, Training
J. Venable, Vice President, Operations
K. T. Walsh, Manager, Operations

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|---------------------|-----|--|
| 05000382/2004002-01 | NCV | Inadequate Corrective Action Affecting Main Feedwater Isolation Valve (Section 1R04.2.1) |
| 05000382/2004002-02 | NCV | Inadequate Maintenance Instruction Affecting Main Feedwater Isolation Valve (Section 1R04.2.2) |
| 05000382/2004002-03 | NCV | Inadequate Design Control of the Diesel Generator Fuel Oil Storage Requirements (Section 1R15) |
| 05000382/2004002-04 | URI | Potential Performance Indicator Error Affecting the Emergency AC Power System Unavailability Criteria (Section 40A1) |
| 05000382/2004002-05 | NCV | Failure to Promptly Identify and Correct EDG Loading and Fuel Oil Consumption Analysis Deficiencies (Section 40A2) |

Closed

| | | |
|---------------------|-----|--|
| 05000382/2004002-01 | NCV | Inadequate Corrective Action Affecting Main Feedwater Isolation Valve (Section 1R04.2.1) |
|---------------------|-----|--|

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|---------------------|-----|--|
| 05000382/2004002-02 | NCV | Inadequate Maintenance Instruction Affecting Main Feedwater Isolation Valve (Section 1R04.2.2) |
| 05000382/2004002-03 | NCV | Inadequate Design Control of the Diesel Generator Fuel Oil Storage Requirements (Section 1R15) |
| 05000382/2004002-05 | NCV | Failure to Promptly Identify and Correct EDG Loading and Fuel Oil Consumption Analysis Deficiencies (Section 40A2) |

LIST OF DOCUMENTS REVIEWED

IP 71111.01

Procedures

Procedure OP-903-521, "Severe Weather and Flooding," Revision 3

Miscellaneous

Regulatory Guide 1.76, "Design Basis Tornado For Nuclear Power Plants"
 FSAR Section 3.3, "Wind And Tornado Loadings"
 FSAR Section 3.5, "Missile Protection"

IP 71111.04

Procedures

Procedures

Operating Procedure OP-009-003, "Emergency Feedwater," Revision 11
 Surveillance Procedure OP-903-066, "Electrical Breaker Alignment Check," Revision 7
 Operating Procedure OP-009-008, "Safety Injection System," Revision 16.

Condition Reports

CR WF3-2003-3705, CR WF3-2003-2666, CR WF3-2003-3478, CR WF3 2002-3835,
 CR WF3-2004-0491, CR WF3-2004-0671, CR WF3-2004-0659, CR WF3 2004-0770,
 CR WF3-2004-0779, CR WF3-2002-00624, CR WF3-2003-3997, CR WF3-2004-00403,
 CR WF3-2004-0016

Miscellaneous

Engineering Request ER-W3-99-0083-00-00, "EFW Quantity for Chapter 15 Events"

Design Basic Document W3-DBD-003, "Emergency Feedwater System," Revision 2-6

Mechanical Maintenance Procedure MM-001-068, "General Torquing and Detensioning Practices," Revision 3

Document NP-7212, "Main Feedwater Isolation Valve Maintenance Guide," May 1991

Maintenance Action Items 417942, 419466

Work Order Packages 00034765, 00034888

IP 71111.05

Procedures

Maintenance Procedure MM-007-010, "Fire Extinguisher Inspection and Extinguisher Replacement," Revision 13

Administrative Procedure UNT-005-013, "Fire Protection Program," Revision 9

Fire Protection Procedure FP-001-015, "Fire Protection System Impairments," Revision 17

Condition Reports

CR WF3-2004-0666, CR WF3-2004-0606, CR WF3-2003-0604, CR WF3 2002-0411, CR WF3 2004-0276

Miscellaneous

FSAR Section 9.5, "Fire Protection System," Revision 12"

IP 71111.12Q

Procedures

SE-MRDT, "Entergy Nuclear South Maintenance Rule Desk Top," Revision 1

Condition Reports

CR-WF3-2003-3110, CR-WF3-2003-3130, CR-WF3-2003-02759, CR-WF3-2002-1557, CR-WF3-2002-1918, CR-WF3-2003-1301, CR-WF3-2003-1389, CR-WF3-2003-1419, CR-WF3-2003-2971, CR-WF3-2003-2972, CR-WF3-2003-3789, CR-WF3-2004-53, CR-WF3-2003-1906, CR-WF3-2003-1256, CR-WF3-2003-778, CR-WF3-2003-829, CR-WF3-2003-933, CR-WF3-2002-1842, CR-WF3-2002-1927, CR-WF3-2002-2041, CR-WF3-2003-860, CR-WF3-2003-1093, CR-WF3-2003-1330, CR-WF3-2003-1448, CR-WF3-2003-1451, CR-WF3-2003-1401, CR-WF3-2003-1501, CR-WF3-2003-1524, CR-WF3-2003-1522, CR-WF3-2003-1523, CR-WF3-2003-2890, CR-WF3-2003-3228, CR-WF3-2003-3371, CR-WF3-2003-3462, CR-WF3-2003-3088, CR-WF3-2003-3877, CR-WF3-2003-3897

IP 71111.15

Procedures

Technical Procedure CE-002-030, "Maintaining Diesel Fuel Oil," Revision 8

Condition Reports

CR WF3-2002-0293, CR WF3-2003-0933, CR WF3-2003-2872, CR WF3 2002-2758,
CR WF3 2004-0483, CR WF3-2004-0420, CR WF3-2004-0494, CR WF3-2003-3088,
CR WF3-2003-0269, CR WF3 2002-2758, CR WF3-2003-2452, CR WF3-2004-0053,
CR WF3-2003-3882,

Miscellaneous

Calculation EC-M95-012, "Minimum Pipe Submerge to Prevent Vortexing," Revision 4

Calculation EC-M75-006, "Design Basis for CCW Makeup," Revision A

Design Basic Document W3-DBD-003, "Emergency Feedwater System," Revision 2-6

American National Standard ANSI N195-1976, "Fuel Oil Systems for Standby Diesel-Generators"

FSAR Chapter 9.5.4, "Diesel Generator Fuel Oil Storage and Transfer Systems"

Calculation EC-I91-053, "Diesel Oil Storage Tank Level Instrumentation Loop Uncertainty Calculation," Revision 1

IP 71111.17

Procedures

OP-003-003, "Condensate-Feedwater," Revision 15

Condition Reports

CR WF3-2002-0953

Miscellaneous

Design Basis Document W3-DBD-020, "Feedwater System," Revision 1-7

Engineering Request ER-W3-2002-0408, "Maintaining Closing Force for MSIV"

FSAR 10.4.7, "Condensate and Feed Systems"

Document NP-7212, "Main Feedwater Isolation Valve Maintenance Guide," May 1991

Calculation EC-M01-001, "Seismic and Weak Link Analysis for Feedwater Isolation Valves,"
Revision 0

IP 71111.19

Procedures

Surveillance Procedure OP-903-014, "Emergency Feedwater Flow Verification," Revision 10

Condition Reports

CR WF3-2003-3705, CR WF3-2003-2666, CR WF3-2003-3478, CR WF3 2002-3835,
CR WF3-2004-0608, CR WF3-2004-0050, CR WF3-2000-1564, CR WF3 2000-0341,
CR WF3-1998-0218, CR WF3-1998-0337, CR WF3-2002-0953, CR WF3 2004-0551,
CR WF3-2002-0173, CR WF3-2000-1542, CR WF3-2003-3993, CR WF3 2000-0266,
CR WF3-2000-0254, CR WF3-2003-3993, CR WF3-2004-0139, CR WF3-2003-3983,
CR WF3-2004-0759, CR WF3-2004-0758, CR WF3 2004-0498, CR WF3-2003-0201,
CR WF3-2003-3979, CR WF3-2003-3984, CR WF3 2004-0477, CR WF3 2004-0304

Miscellaneous

Engineering Request ER-W3-98-1084, "Feedwater Isolation Valve Actuator Thrust
Enhancement," Calculation EC-M00-006, "Closure Time Analysis for Analysis for Main
Feedwater Isolation Valves FW-184A(B)," Revision 0

Calculation EC-M98-003, "Design Basis Review for Feedwater Isolation Valves FW-184A & B,"
Revision 0

Document NP-7212, "Main Feedwater Isolation Valve Maintenance Guide," May 1991

Work Orders

24237, 34888, 32748, 303093, 34751, 37771, 36537

IP 71111.22

Procedures

Surveillance Procedure OP-903-046, "Emergency Feed Pump Operability Check," Revision 15

Condition Reports

CR WF3-2003-0023, CR WF3-2003-0342, CR WF3-2004-0026, CR WF3 2004-0524,
CR WF3-2004-0249

Miscellaneous

Engineering Request ER-W3-99-0849, "4.16 KV Undervoltage Relays," Revision 0
Calculation EC-E91-053, Technical Specification Relay Drift IAV and IAC Relays," Revision 2
Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems"
Calculation 3-B-12, "Primary Coolant Leakage Rate Detection By Air Monitor," Revision 0

Work Orders

34941, 50688959, 31458, 50488770, 50279372, 50232201, 50488753

LIST OF ACRONYMS

EDG emergency diesel generator
CFR *Code of Federal Regulations*
FSAR final safety analysis report
PDR public document room
NRC Nuclear Regulatory Commission
SER safety evaluation report