



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W.  
ATLANTA, GEORGIA 30323

Report No: 50-416/92-27

Licensee: Entergy Operations, Inc.  
Jackson, MS 39205

Docket No.: 50-416

License No.: NPF-29

Facility Name: Grand Gulf Nuclear Station

Inspection Conducted: November 8 through December 19, 1992

Inspectors: *R. H. Bernhard* 12/23/92  
R. H. Bernhard, Senior Resident Inspector Date Signed

*C. A. Hughey* 12/23/92  
C. A. Hughey, Resident Inspector Date Signed

Approved by: *F. S. Cantrell* 12/23/92  
F. S. Cantrell, Chief Date Signed  
Projects Section 1B  
Division of Reactor Projects

SUMMARY

Scope:

The resident inspectors conducted routine inspections in the following areas: operational safety verification, maintenance observation, surveillance observation, cold weather preparations, licensee self-assessment capability, action on previous inspection findings and reportable occurrences. The inspectors conducted backshift inspections on November 15, 16, 17 and 30, 1992, and on December 14, 1992.

Results:

One non-cited violation was identified for failure to properly establish an hourly fire watch patrol when two fire doors were blocked open (Paragraph 3).

One Inspector Followup Item concerning chloride containing fire retardant material overspray and its effect on stainless tubing and piping was identified (Paragraph 3). The licensee met the safety objectives in the areas of safety verification, maintenance/surveillance activities, and cold weather protection (Paragraphs 3, 4, 5, and 6).

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

W. Cottle, Vice President, Nuclear Operations  
\*L. Daughtery, Superintendent, Plant Licensing  
M. Dietrich, Manager, Training  
\*J. Dimmette, Manager, Performance and System Engineering  
\*C. Dugger, Manager, Plant Operations  
\*C. Ellsaesser, Assistant Operations Manager  
\*C. Hicks, Operations Superintendent  
\*C. Hutchinson, General Manager, Plant Operations  
F. Mangan, Director, Plant Projects and Support  
M. Meisner, Director, Nuclear Safety and Regulatory Affairs  
D. Pace, Director, Nuclear Plant Engineering  
\*J. Reaves, Assistant Director, Quality Programs  
\*J. Roberts, Manager, Plant Maintenance  
R. Ruffin, Plant Licensing Specialist

Other licensee employees contacted included superintendents, supervisors, technicians, operators, security force members, and administrative personnel.

\*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

SALP Presentation and meeting with local officials attendees (November 13, 1992)

#### NRC Employees

S. D. Ebner, Regional Administrator, Region II (RII)  
B. S. Mallett, Deputy Director, Division of Radiation Safety and Safeguards (DRSS), RII  
J. T. Larkins, Director, Project Directorate IV-1, Office of Nuclear Reactor Regulation (NRR)  
P. W. O'Connor, Project Manager, Project Directorate IV-1, NRR  
K. M. Clark, Public Affairs Officer, RII  
R. E. Trojanowski, Regional State Liaison Officer, RII  
F. S. Cantrell, Chief, Reactor Projects Section 1B, Division of Reactor Projects (DRP), RII  
J. L. Mathis, Senior Resident Inspector, During the SALP Cycle, Grand Gulf, DRP, RII  
R. H. Bernhard, Current Senior Resident Inspector, Grand Gulf, DRP, RII  
C. A. Hughey, Resident Inspector, Grand Gulf, DRP, RII

### Licensee Employees

D. Hintz, President and Chief Executive Officer of Entergy Operations  
 W. Cottle, Vice President, Nuclear Operations  
 C. Hutchinson, General Manager, Plant Operations  
 F. Mangan, Director, Plant Projects and Support  
 J. Dimmette, Manager, Performance and System Engineering  
 J. Roberts, Manager Plant Maintenance  
 C. Morgan, Manager, Emergency Planning

### And Other Grand Gulf Staff

### Local Officials

S. Goods, Circuit Clerk, Claiborne Co. (CCo.)  
 B. Young, Director, Port Gibson (PG)/CCo., Civil Defense Council  
 F. White, Superintendent of Education, CCo.  
 A. Butler, Supervisor, District #1, CCo.  
 E. Doss, Jr., Claiborne Co. Tax Assessor/Collector  
 E. Carter, Supervisor, District #2, CCo.  
 J. Gray, Claiborne County Election Commission  
 E. Walls, Jr., City of PG Alderman-Ward #1  
 M. Strawberry, Secretary to Board of Supervisors, CCo.  
 R. Foster, Director, Emergency Management for Tensas Parish,  
 St. Joseph, La.  
 J. Maher, Director, Mississippi Emergency Management Agency

## 2. Plant Status

The plant operated in Mode 1, power operations, during the entire reporting period. As of the end of the reporting period, the unit had been on line for 134 days.

An open meeting was held at 1:00 p.m. on November 13, 1992, with Entergy Operations, Inc. at the Grand Gulf Facility, to discuss the Systematic Assessment of Licensee Performance (SALP) for the period February 24, 1991, through August 27, 1992 (NRC Inspection Report No. 50-416/92-20). Following the SALP presentation a separate open meeting was convened with local officials as discussed in paragraph 9. Attendees at this meeting are listed in Paragraph 1.

## 3. Operational Safety (71707)

Daily discussions were held with plant management and various members of the plant operating staff. The inspectors made frequent visits to the control room to review the status of equipment, alarms, effective LCOs, temporary alterations, instrument readings, and staffing. Discussions were held as appropriate to understand the significance of conditions observed.

Plant tours were routinely conducted and included portions of the control building, turbine building, auxiliary building, radwaste building and outside areas. These observations included safety related tagout

verifications, shift turnovers, sampling programs, housekeeping and general plant conditions. Additionally, the inspectors observed the status fire protection equipment, the control of activities in progress, the problem identification systems, and the readiness of the onsite emergency response facilities. No deficiencies were identified.

The inspectors reviewed the activities associated with the listed events below:

During a review of MNCR 0007-90, dated January 19, 1990, the inspectors noted that a large amount of fire retardant material had been oversprayed onto stainless steel, in some cases completely imbedding safety related instrument tubing. Licensee documentation stated that this material contained magnesium oxychloride and could be potentially corrosive to stainless steel under certain conditions. This fire retardant material had been installed during plant construction. At the end of this inspection period this MNCR had not been closed out. The completed evaluation of this issue, including 1) where this material is installed in the plant, 2) the possible long term corrosive effects to stainless steel, and 3) any thermal growth or other loading consideration on tubing/piping, will be followed as Inspector Followup Item 50-416/92-27-01.

On December 12, 1992, ongoing work by craft personnel in the auxiliary building required fire doors 1A215 and 1A413 to be propped open to allow flush hoses to be routed to the work site. LCO 92-1749 was properly initiated and required hourly firewatches by operations. That same evening, operators on routine rounds noticed that the work requiring the fire doors to remain open had stopped for the day. Subsequently, operations disconnected the hoses, closed the fire doors, terminated the associated hourly fire checks, and closed the LCO at 2215 hours. At 0635 hours the next morning, the same craft personnel resumed work and, apparently assumed that the previous day's fire door LCO was still in effect, blocked open the same fire doors to route their flush hoses. As a result, neither a new LCO nor a firewatch for these doors were initiated. At approximately 1430 hours the Operations Shift Supervisor realized that the doors may have been reopened since work was still ongoing. An LCO and hourly firewatches were established.

Corrective actions initiated by the licensee to prevent recurrence included directing the Operations Superintendent to evaluate the LCO procedure for possible improvements and directing the Operations/Fire Protection Coordinator to review the fire protection program and develop an improved and more conspicuous means of fire door identification.

License Condition 2.C.(41) states, in part, that Entergy Operations, Inc. shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in Revision 5 to the Updated Final Safety Analysis Report (UFSAR). Chapter 16, Appendix A, of the UFSAR contains the Fire Protection System Technical Specifications. With an inoperable (open) fire door, Section 3.7.7.a requires, verification of OPERABILITY of fire detectors on at least on one side of the inoperable fire door and establishment of hourly fire watch patrol.

This licensee identified violation is not being cited because the criteria specified in Section VII.B of the Enforcement Policy were satisfied. This item was identified as non-cited violation (NCV) 50-416/92-27-02, failure to establish hourly fire watch patrol, and was opened and closed during this inspection period.

One inspector followup item and one non-cited violation were identified.

4. Maintenance Observation (62703)

During the report period, the inspectors observed portions of the maintenance activity listed below. The observations included a review of the MWO and other related documents for adequacy; adherence to procedure, proper tagouts, technical specifications, quality controls, and radiological controls; observation of work and/or retesting; and specified retest requirements.

MWO

DESCRIPTION

85745

Rebuild hydraulic control unit (44-45)

No violations or deviations were identified. The results of the inspections in this area indicated that maintenance activities were effective.

5. Surveillance Observation (61726)

The inspectors observed the performance of portions of the surveillances listed below. The observations included a review of the procedures for technical adequacy, conformance to technical specifications and LCOs; verification of test instrument calibration; observation of all or part of the actual surveillances; removal and return to service of the systems or components; and review of the data for acceptability based upon the acceptance criteria.

06-CH-1N62-M-0048,

Pretreatment Offgas Isotopic Analysis,  
Rev. 29.

06-OP-1E51-Q-0002,

RCIC System Valve Operability Test, Revision 30.

06-OP-1P75-M-0001,

Standby Diesel Generator (SDG) II Functional  
Test, Revision 37.

On December 2, 1992, the inspectors also observed portions of the performance of Technical Special Test Instruction TSTI 1E12-92-014-0-S, Change No. 1, "RHR to Radwaste Inboard Shut off Valve 1E12-F049 DP Test." This was a test to determine the thrust required to cycle the motor operated valve at various differential pressures to confirm operability pursuant to Generic Letter 89-10. The inspectors reviewed the procedure for adequacy and found the test to be well-written and technically correct. The required 10 CFR Part 50.59 screening was completed satisfactorily; no safety evaluation was required. The test was conducted in a deliberate and

professional manner. A minor problem was experienced with the test instrumentation causing about a 1/2 hour delay, but the problem was resolved and the test completed without incident.

No violations or deviations were identified. The observed surveillance tests were performed in a satisfactory manner and met the requirements of the Technical Specifications.

#### 6. Cold Weather Preparation (71714)

The objective of this inspection was to determine whether the licensee had effectively implemented their program to protect safety-related systems against extreme cold weather.

The inspectors noted that the licensee implemented a cold weather protection program under Equipment Performance Instruction 04-1-03-A30-1, Revision 4, Change 2, "Cold Weather Protection." The procedure required the licensee to take the protective actions for cold weather prior to cold weather conditions. On November 5, 1992, the licensee implemented these actions. The inspectors reviewed the completed data sheets and found the checklist completed with deficiencies noted by the performer. The deficiencies were in the process of being resolved by the licensee at the time of this inspection. The inspectors discussed the status of the deficiencies with the licensee and had no concerns. The licensee's cold weather protection program appeared to be effective.

No violations or deviations were identified.

#### 7. Action on Previous Inspection Findings (92701, 92702)

(Closed) Violation 91-23-01, Inadequate procedure for testing of the drywell airlock. Procedure 06-ME-1M61-V-0001, Local Leak Rate Test, was revised to include steps for installation of a plug in the check valve port and removal of the blind flange for airlock leak rate testing. Additionally the weekly operating logs were revised to add steps to monitor drywell airlock internal pressure. This item is closed.

(Closed) Inspector Followup Item 91-23-02, Followup on root cause of SLCS pump 'B' expansion bellows cracking. A root cause determination performed by corporate metallurgical engineers concluded that the cracks were initiated and propagated by high cycle, low stress induced fatigue. The additional cyclic stress induced by rubbing contact of the flow diverter tube contributed greatly to the initiation and propagation of the through wall crack in the Inconel 625 alloy bellows. The pump discharge bellows was replaced. Alignment criteria for bellows installations were developed and used. This item is considered closed.

(Closed) P2190-09, Circumferential groove was observed on the inside surface of a Byron-Jackson reactor recirculation pump bearing journal at another facility. As part of an overall effort to solve reactor recirculation pump shaft cracking problems at the Grand Gulf facility, the licensee had contracted with a foreign vendor to redesign the pump shafts



and heat exchangers. This redesign included, among other things, reshaping of the lower portion of the pump heat exchanger to reduce flow impingement on the heat exchanger and; therefore, prevent internal journal bearing wear since similar erosion had been noted at Grand Gulf. These modified shafts and heat exchangers were installed in both "A" and "B" pumps during the Spring 1992 refueling outage (RF05). Current licensee plans are to remove the "B" pump seal, rotation baffle, and shaft sleeve during RF06 (Fall 1993) for inspection.

(Closed) Violation 90-23-01, Two examples of failure to take corrective actions. Example 1) Failure take adequate corrective actions to prevent the loss of secondary containment during core alterations. More strict administrative controls were placed on controlling access through secondary containment doors when secondary containment entry is required. These controls included revising Integrated Operating Instruction 03-1-01-5, Refueling, Revision 27, to require personnel to be posted at secondary containment doors to ensure that doors are closed immediately after use and to post secondary containment doors not in use "For emergency use only" and have their security card readers disabled. During the Spring 1992 outage (RF05), similar incidences were significantly reduced. This item is closed. Example 2) Failure to prevent the tripping of power distribution breakers. Administrative Procedure 01-S-16-2, Modification Work Permits was revised (Revision 4) to include additional requirements for a walkdown to be performed by operations during modes 3, 4, and 5, to determine the effect on plant equipment prior to the implementation of any completed modification. In addition, improved permanent covers have been installed over sensitive breakers on motor control centers to prevent inadvertent operation by personnel working near the panels. The inspectors determined that the additional administrative controls along with the improved breaker covers should reduce the incidences of inadvertent breaker operation. This item is closed.

(Closed) Violation 90-23-02, Two examples of inadequate procedure for the restoration of systems. Example 1) Loss of shutdown cooling. On October 26, 1990, a loss of shutdown cooling occurred during system restoration following an ECCS test. This event was reported by the licensee pursuant to 10 CFR 50.73(a)(2)(vii). Licensee event report (LER) 90-022 and LER 90-022-01 documented the details and corrective actions associated with this event. The licensee's review of this event concluded that the major cause of the isolation was the overlapping of Operations and I&C surveillances on shutdown cooling isolation valves, along with verbal communication difficulties. Further licensee review concluded that special test instructions concerning the use of status indicators (lights) should be included in the appropriate I&C Surveillance procedures prior to RF05. The following I&C surveillance procedures were reviewed by the inspectors to insure that the appropriate revisions were made.

- 1) 06-IC-1B21-M-1002, Reactor Vessel High/Low Pressure(RPS/RHR) Isolation, Revision 28.
- 2) 06-IC-1B21-R-0001, Reactor Vessel High Pressure (RPS/RHR Shutdown Cooling Isolation), Revision 32.

- 3) 06-IC-1B21-R-0038, Reactor Vessel Steam Dome Pressure (RPS), Revision 22.

These changes were considered adequate and this item is therefore considered to be closed.

Example 2) Initiation of standby fresh air unit "A". On November 14, 1990, an inadvertent auto start of the ESF Division I control room standby fresh air unit "A" resulted due to an inadequate Technical Special Test Instruction (TSTI). As a result, the licensee revised TSTI 1L62-90-001-0-S-01 prior to continuing the test. In addition, the test directors and technical reviewers were counseled on verbatim compliance and adequate reviews of all special tests prior to beginning. These corrective actions were considered to be adequate; and this item is considered closed.

(Closed) Violation 92-09-01, Inadequate procedure. During April 1992, the scope of a work order was changed without control room review prior to beginning the work. This resulted in a gaseous effluent monitor becoming inoperable without control room knowledge. As a result, the licensee revised Administrative Procedure 01-S-07-1, Control of Work on Plant Equipment and Facilities, to require control room re-authorization when the scope of a work order changes to a new discipline. The inspectors reviewed Revision 26 of this procedure to insure that these changes had been made and were appropriate. This item is closed.

(Closed) IFI 90-06-04, Followup on fuel pool cooling and cleanup SSFA items. The inspector reviewed the licensee actions in response to the six items identified in report 50-416/90-06 and considered them adequate. This item is closed. During this review, additional questions were raised by the inspectors concerning the chloride content of fire retardant material that was oversprayed onto stainless steel piping. This concern is discussed in more detail in paragraph 3.

#### 8. Reportable Occurrences (92712 and)

- a. On December 16, 1992, the Post-accident Sampling System (PASS) was declared inoperable due to a system failure that resulted in the backflooding of the PASS containment atmospheric system and subsequently, the portions of the drywell fission product monitoring system, which is cross-connected with the PASS. The resident inspectors were notified and a one-hour notification was made by the licensee to the NRC Operations Center per 10 CFR 50.72(b)(1)(v). Troubleshooting on December 16-17, 1992, failed to identify the cause and the system was declared operable at 1140 hours.
- b. On December 15, 1992, at 1424 hours, an isolation of the RCIC system resulted from an alarm indicating "RCIC equipment area temperature high". Two RCIC valves that are containment isolation valves automatically closed. The RCIC system was declared inoperable and the HPCS system was verified to be operable. An initial investigation by the licensee revealed a faulty Reiley temperature transmitter which was subsequently replaced. The RCIC was declared



operable on December 15, 1992, at 2200 hours. The resident inspectors were notified and a four hour notification was made by the licensee to the NRC Operations Center per 10 CFR 50.72(b)(2)(ii).

No violations or deviations were identified.

9. Information Meetings with Local Officials (94600)

On November, 13, 1992, local government officials from Clairborne County, Mississippi; Port Gibson, Mississippi; Tensas Parish, Louisiana; and the State of Mississippi attended the SALP presentation given by the NRC to Entergy Operations, Inc. Following the SALP presentation, NRC management met with these government officials in a open meeting to discuss the mission of the NRC and, in particular, the responsibilities of Region II. The areas of emergency planning and interfaces between the licensee, local officials and state officials were discussed. Concerns were expressed by some local officials regarding these interfaces and providing more information to the public. Licensee and state officials present indicated that this area would receive additional attention.

No violations or deviations were identified.

10. Exit Interview (30703)

The inspection scope and findings were summarized on December 18, 1992, with those persons indicated in paragraph 1 above. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. The licensee had no comment on the following inspection findings:

<u>Item Number</u>	<u>Description and Reference</u>
50-416/92-27-01, IFI	Followup of evaluation of fire retardant material overspray.
50-416/92-27-02, NCV	Failure to establish hourly fire watch patrol.

11. Acronyms and Initialisms

ADHRS	-	Alternate Decay Heat Removal System
ADS	-	Automatic Depressurization System
APRM	-	Average Power Range Monitor
ATWS	-	Anticipated Transient Without Scram
BWR	-	Boiling Water Reactor
CRD	-	Control Rod Drive
DCP	-	Design Change Package
DG	-	Diesel Generator
ECCS	-	Emergency Core Cooling System
ESF	-	Engineering Safety Feature
FCV	-	Flow Control Valve

HPCS	-	High Pressure Core Spray
HPU	-	Hydraulic Power Unit
I&C	-	Instrumentation and Control
IFI	-	Inspector Followup Item
LCO	-	Limiting Condition for Operation
LER	-	Licensee Event Report
LLRT	-	Local Leak Rate Test
LPCI	-	Low Pressure Core Injection
LPCS	-	Low Pressure Core Spray
MNCR	-	Material Nonconformance Report
MSIV	-	Main Steam Isolation Valve
MWO	-	Maintenance Work Order
NPE	-	Nuclear Plant Engineering
NRC	-	Nuclear Regulatory Commission
PDS	-	Pressure Differential Switch
P&ID	-	Piping and Instrument Diagram
PSW	-	Plant Service Water
QDR	-	Quality Deficiency Report
RCIC	-	Reactor Core Isolation Cooling
RHR	-	Residual Heat Removal
RPS	-	Reactor Protection System
RWCU	-	Reactor Water Cleanup
RWP	-	Radiation Work Permit
SBLC	-	Standby Liquid Control
SOI	-	System Operating Instruction
SRV	-	Safety Relief Valve
SSW	-	Standby Service Water
TCN	-	Temporary Change Notice
TS	-	Technical Specification