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

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Report No.: 50-416/90-23

Licensee: Entergy Operations, Inc.
Jackson, MS 39205

Docket No.: 50-416 License No.: NPF-29

Facility Name: Grand Gulf Nuclear Station

Inspection Conducted: October 20 through November 16, 1990

Inspectors: _____ 11/23/90
H. O. Christensen, Senior Resident Inspector Date Signed

_____ 11/23/90
J. L. Mathis, Senior Resident Inspector Date Signed

Approved by: _____ 11/23/90
F. S. Cantrell, Section Chief, Division of Reactor Projects Date Signed

SUMMARY

Scope

The resident inspectors conducted a routine inspection in the following areas: operational safety verification, maintenance observation, surveillance observation, refueling activities, and reportable occurrences. The inspectors conducted backshift inspections on October 27 and 31 and November 11, 12 and 14, 1990.

Results

During this inspection three violations were identified. The first violation, with two examples, was for failure to take adequate corrective action to prevent the loss of secondary containment integrity during core alteration (paragraph 3) and for the failure to prevent the tripping of a power distribution breaker (paragraph 3). The second violation, with two examples, was for inadequate procedure. The first example was the inadequate restoration from an ECCS test, which resulted in loss of shutdown cooling (paragraph 3); the second example was for the inadequate restoration of power to inverter 1Y87, which resulted in the initiation of standby fresh air Unit A (paragraph 3). The third violation is for failure to have adequate design testing of the interlocks for the horizontal fuel transfer system (paragraph 6). These violations do not appear programmatic in nature; however, they indicate that the licensee may need to place greater attention on activities concerning restoration of systems.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

W.T. Cottle, Vice President, Nuclear Operations
D.G. Cupstid, Manager, Plant Projects
*L.F. Daughtery, Compliance Supervisor
*M.A. Dietrich, Director, Quality Programs
J.P. Dimmette, Manager, Plant Maintenance
C.W. Ellsaesser, Operations Superintendent
*C.R. Hutchinson, GGNS General Manager
*F.K. Mangan, Director, Plant Projects and Support
*M.J. Meisner, Director, Nuclear Licensing
L.B. Moulder, Acting Manager, Plant Support
J.V. Parrish, Manager, Plant Operations
*J.C. Roberts, Manager, Plant & System Engineering
*J.E. Reaves, Manager, Quality Services
F.W. Titus, Director, Nuclear Plant Engineering
G.W. Vining, Manager, Plant Modification and Construction
*G. Zinke, Superintendent, Plant Licensing

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

NRC personnel

N. Casas, Inspector Trainee from Mexican National Nuclear Safety and Safeguards Commission
D. Verrilli, Branch Chief, Division of Reactor Projects

*Attended exit interview

D. Verrelli, Branch Chief, Division of Reactor Projects, was on site November 15 and 16, 1990 to tour the site and conduct discussions with the resident inspectors and plant management.

2. Plant Status

At the beginning of this inspection period the plant was in mode 5, refueling. Mode 4, cold shutdown was entered on November 14, 1990.

3. Operational Safety, (71707, and 93702)

The inspectors kept aware of the overall plant status, and of any significant safety matters related to plant operations. Daily discussions were held with plant management and various members of the plant operating staff. The inspectors made frequent visits to the control room. Observations included: verification of instrument readings, setpoints and recordings; review of operating system status and tagging of equipment; verification of annunciator alarms, limiting conditions for operation, and temporary alterations; and review of daily journals, data sheet entries, control room manning, and access controls.

Weekly, selected engineered safety feature (ESF) systems were confirmed operable. The inspectors verified that accessible valve flow path alignments were correct, power supply breakers and fuse status were correct and instrumentation was operational. The inspectors verified the following systems operable: LPCS, HPCS, SSW B and SSW C.

The inspectors conducted plant tours weekly. Portions of the control building, turbine building, auxiliary building and outside areas were visited. The observations included safety related tagout verifications, shift turnovers, sampling programs, housekeeping and general plant conditions. Additionally, the inspectors observed the status of fire protection equipment, the control of activities in progress, the problem identification systems, and the readiness of the onsite emergency response facilities.

The inspectors observed health physics management's involvement and awareness of significant plant activities, and observed plant radiation controls. Periodically the inspectors verified the adequacy of physical security control. Additionally, senior plant management was observed making routine tours of the plant.

The inspectors reviewed safety related tagouts, 903423 (instrument air supply to ADS); 903379 (RHR C test return to suppression pool) and 903361 (ADS handswitch) to ensure that the tagouts were properly prepared, and performed. Additionally, the inspectors verified that the tagged components were in the required position.

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

- On October 20, 1990, at approximately 1710 while fuel shuffling was in progress, the licensee found secondary containment door 1A401 open. Technical Specification 3.6.6.1 requires secondary containment integrity be maintained when irradiated fuel is being handled in the primary or secondary containment. Core alteration was suspended upon notification by the control room that the door was found opened. The

door was secured and core alteration resumed. The licensee determined the door was open a maximum of 10 minutes. A similar case occurred on October 9, 1990, when secondary containment integrity was in effect, the same door 1A401 was found propped open. During this time core alteration was not being performed. Upon discovery on October 9 that the door was open, the licensee posted personnel at all secondary containment doors to ensure that these doors were secured after each use. The licensee relaxed this requirement 7 days later. The licensee reposted personnel at secondary containment doors after the October 20, 1990, event. The failure to implement and maintain adequate corrective action to prevent recurrence is a violation of 10 CFR 50, Appendix B, Criterion XVI. This is the first example for failure to take adequate corrective action and will be documented as violation 90-23-01.

- On October 26, 1990, at approximately 0344 the High Pressure Core Spray (HPCS) pump started but did not inject. The HPCS pump and HPCS diesel generator received a spurious reactor low level initiation signal due to I&C technicians performing a calibration on reactor level instrument B21-N078D. The technician's removal of test equipment caused a spike to the instrumentation. The auto injection valve, E22F004, was closed and remain closed due to an actual reactor vessel high water level (level 8). The manual injection valve was closed and tagged due to ECCS testing. The HPCS pump and the Division III diesel generator was secured. A 50.72 report was made by the licensee.

- On October 26, 1990, operations was restoring from the 18 month standby diesel generator II ECCS functional test (06-OP-1P75-R-0003) while I&C personnel were performing surveillance 06-IC-1B21-R-0001, Reactor Vessel High Pressure Calibration. An operator was restoring the LHR A system to the standby lineup, when he noticed that breaker (52-153109) for E12-F008 (common suction for shutdown cooling) was open. The operator was unaware that I&C technicians were performing a surveillance for reactor vessel high pressure or that the surveillance required breaker E12-F008 be open. The operator had the breaker closed. When the breaker was energized, the E12-F008 valve closed causing the RHR B pump to trip. This resulted in a loss of shutdown cooling. E12-F008 was reopened and flow re-established, with no increase in reactor coolant temperature. Technical Specification 6.8.1 requires that written procedures be established, implemented and maintained. Procedure 06-OP-1P75-R-0003 was inadequate for the restoration of systems after the test in that it required that the system operating instruction be used, and neither procedure had adequate caution steps to alert the operators to other tests that might be in progress that could effect normal lineup. This is the first example of violation 90-23-02, failure to maintain adequte procedures for the restoration of systems.

- On October 30, 1990, at approximately 0312 a contract employee inadvertently bumped the handle to breaker 52-152109, which supplies power to panel 15P21. When the breaker was deenergized several drywell, containment and auxiliary building isolation valves lost power and closed. The contract person immediately reclosed the breaker and continued on with his work activity. Breaker 52-152109 had been inadvertently deenergized previously due to personnel bumping into its handle. Two previous two similar incidents occurred on October 14 and 15, 1990 and are documented in Inspection Report 90-20. The corrective action implemented for the October 15 incident, consisted of placing plastic foam around the breaker handle and other sensitive breakers identified in a walkdown to determine other potential troublesome areas. Although these corrective actions were implemented prior to October 15 they still did not prevent this problem from reoccurring. Failure to implement adequate corrective action for preventing the tripping of breaker 52-152109 is the second example of violation 90-23-01.

- On November 5, 1990, at approximately 1958 during the restoration of electrical bus 16AB (4.16 KV ESF Division 2) and its respective DC bus, a shutdown cooling isolation occurred due to the closing of E12-F008, Shutdown Cooling Suction Valve. A jumper had been placed (via banana jacks) around the normally energized closed contact (B21-K124D) that is in series with the shutdown cooling suction valve (E12-F008) isolation logic relay. The jumper prevents an isolation of E12-F008 when the AC and DC buses are denergized. When the jumper was removed a five amp power supply fuse (B21-F23A) for the isolation logic relay simultaneously blew causing the E12-F008 valve to close, thereby causing the Alternate Decay Heat Removal (ADHR) pumps to trip on low suction pressure. The fuse was replaced and ADHR system was restored to service. Shutdown cooling was lost for approximately 25 minutes which resulted in an indicated temperature increase of 3 degrees (91 F to 94 F). The increase in temperature was not considered significant.

- On November 14, 1990 at approximately 1510 the control room standby fresh air unit A automatically started during the performance of Technical Special Test Instruction (TSTI) 1L62-90-001-0-S-01 for restoring power to static inverter 1Y87. The instruction was inadequate for restoring power to the inverter in that it required normal power to be removed from static inverter 1Y87 prior to the restoration of alternate power. As a result, the inverter loads which consisted of control room ventilation radiation monitors were deenergize, causing an ESF division 1 auto start of control room standby fresh air unit A. This procedural inadequancy is a second example of violation 90-20-02.

The individual examples do not indicate a programmatic breakdown of outage activities; however, collectively, they indicate a need for greater management attention to restoration activities.

4. Maintenance Observation (62703)

During the report period, the inspectors observed portions of the maintenance activities listed below. The observations included a review of the MWOs 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
7084	Overspeed trip test division II D/G.
20896	Clean and inspect 15AA bus.
23836	MOVATS baseline testing E30F591B.

No violations or deviations were identified. The observed activities were conducted in a satisfactory manner and the work was properly performed in accordance with approved maintenance work orders.

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 system or component; and review of the data for acceptability based upon the acceptance criteria.

06-IC-1B21-M-2006	Main Condenser Low Vacuum (MSLIS) Functional Test.
06-IC-1C51-V-0001,	Intermediate Range Power Monitor Calibration, Channel F.
06-OP-1P75-M-001,	Standby Diesel Generator II, Functional Test, Attachment IV.
06-OP-1P75-R-0003,	Standby Diesel Generator II, 18 Month Functional Test. (Simulated LOP/LOCA).

No violations or deviations were identified. The observed surveillance tests were performed in a satisfactory manner and met the requirements of TS. The two events documented in paragraph 3, the HPCS initiation and the loss of shutdown cooling, indicates that greater attention should be placed on restoration of systems.

6. Refueling Activities (60710)

On October 24, 1990, a fully grappled fuel bundle, XNB-487, was being moved from core location 17-54 to 21-58. The movement was being performed using the refueling bridge "Laser-Trac" positioning system. "Laser-Trac" automatically positions and lowers the fuel bundle to approximately two feet above (363 inches) the designated core location. Once positioned the operator takes over and manually lowers the bundle. During the lowering evolution, the refueling mast failed to stop at 363 inches and accelerated to greater than normal down travel speed. At a mast height of 400 inches, the "emergency stop" push button was pressed; however, the fuel bundle continued to descend until it seated in to its designated location. The bundle traveled straight into its location without striking any adjacent components. No obvious damage was apparent. Chemistry samples and radiation surveys were performed and they did not indicate fission product release. The fuel bundle was removed and inspected. No damage was detected on the bundle or the reactor internals; however, the fuel bundle was replaced with another fuel bundle.

The licensee determined the fuel hoist motor brake manual disengage lever had bound on the brake housing cover; and the emergency brake manual disengage level had bound to the ratchet/pawl bar and rode up, where the rod could lock in the disengaged position. Both brake failure were independent of each other. The licensee believes that the emergency brake failure occurred prior to the normal motor brake failure.

On October 31, 1990, at approximately 1300 during fuel movement, the Horizontal Fuel Transfer System (HFTS) carrier made contact with fuel bundle XNA060 which had been removed from the carrier with the Fuel Handling Platform (FHP). The contact was made after the FHP trolley had cleared the interlock zone which prohibits operation of the HFTS carrier. The carrier was transferring from the vertical to the horizontal position when contact was made with the fuel bundle nose piece. the licensee immediately placed the fuel bundle in a safe position (Spent fuel pool) and suspended all use of the HFTS. Subsequent visual inspection did not disclose any damage to the fuel bundle.

Material Nonconformance Report (MNCR) 241-90 documented that the present design of the HFTS interlocks are not in conformance with Technical Specification 3.9.12 which governs safe operation of the HFTS and FHP. The licensee's evaluation determined that the interlock actuated by limit switch (LS)-2 and LS-5 were never intended to preclude impacting the carrier of the HFTS due to relative position of the FHP with respect to the HFTS carrier.

The corrective action implemented by the licensee consisted of relocating the trip plate (cam) that operates LS-5 so that operation of the HFTS carrier is prohibited when the FHP trolley is in a zone where fuel suspended from the main hoist could come into contact with the HFTS carrier. 10 CFR part 50, Appendix B, Criteria III, Design Control states that design control measures shall provide for verifying or checking the

adequacy of design by the performance of a suitable testing program. Design testing was inadequate for the interlock associated with the HFTS/FHP. This will be documented as violation 90-23-03.

The refueling floor activities continued to be the critical path for the refueling outage. The problems with the vessel disassemble, the fuel handling equipment problems, and the repairs to the vessel guide rods contributed approximately 12 days to the scheduled 46 day outage. Inadditional to the above items, additional outage activities were identified. These included replacement or repair of the SSW basins pipe supports, the increase in snubber testing, and the repair to the low pressure turbine pedestal.

7. Reportable Occurrences (90712 and 92700)

The event reports listed below were reviewed to determine if the information provided met the NRC reporting requirements. The determination included adequacy of event description, the corrective action taken or planned, the existence of potential generic problems and the relative safety significance of each event. The inspectors used the NRC enforcement guidance to determine if the event met the criterion for licensee identified violations.

(Closed) LER 90-17, Reactor Scram Due to Loss of BOP Busses. On September 16, 1990, the unit scrammed due to a malfunction of the division I load shedding and sequencing system. This event was documented in NRC inspection report 90-20. The malfunction was attributed to a defective light bulb, which caused degradation of the LSS computer chips. This LER is closed.

(Closed) LER 90-018, Secondary Containment Doors Found Open During Refueling Outage. The licensee reported the initial events on October 8 and 9, 1990, and they were documented in NRC inspection report 90-20. The October 20, 1990, event is documented in paragraph 3 of this report. This LER will be administratively closed and the corrective actions tracked under violation 90-23-01.

(Closed) LER 90-019, Isolation Due to Inadvertent Breaker Operation. On three occasion the same power supply breaker was inadvertently opened. These events are documented in NRC inspection report 90-20 and paragraph 3 of this report. This LER will be administratively closed and the corrective actions tracked under violation 90-23-01.

(Closed) LER 90-020, Containment Cooling System Isolation on High Radiation Level. On October 10, 1990, two containment vent isolation dampers isolated on a high radiation level signal received when the steam separator was being lifted from the reactor vessel. The licensee revised the Integrated Operating Instructions 03-1-01-5, Refueling to anticipate the isolation of the containment vent exhaust dampers during future separator lifts. This LER is closed.

8. Exit Interview (30703)

The inspection scope and findings were summarized on November 16, 1990, 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:

Item Number	Description and Reference
VIO 90-23-01	Two examples of failure to take adequate corrective action. Paragraph 3.
VIO 90-23-02	Two examples of inadequate procedure for the restoration of systems. Paragraph 3.
VIO 90-23-03	Failure to maintain adequate design control for verifying HFTS interlocks. Paragraph 6.

9. Acronyms and Initialisms

ADHRS- Alternate Decay Heat Removal System
ADS - Automatic Depressurization System
BWR - Boiling Water Reactor
DCP - Design Change Package
DG - Diesel Generator
ECCS - Emergency Core Cooling System
ESF - Engineering Safety Feature
FHP - Fuel Handling Platform
HFTS - Horizontal Fuel Transfer System
HPCS - High Pressure Core Spray
I&C - Instrumentation and Control
LCO - Limiting Condition for Operation
LER - Licensee Event Report
LPCS - Low Pressure Core Spray
MNCR - Material Nonconformance Report
MWO - Maintenance Work Order
NPE - Nuclear Plant Engineering
NRC - Nuclear Regulatory Commission
P&ID - Piping and Instrument Diagram
PSW - Plant Service Water
RHR - Residual Heat Removal
RWP - Radiation Work Permit
SSW - Standby Service Water
TS - Technical Specification