ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	50-416
License No.:	NPF-29
Report No.:	50-416/99-16
Licensee:	Entergy Operations, Inc.
Facility:	Grand Gulf Nuclear Station
Location:	Waterloo Road Port Gibson, Mississippi 39150
Dates:	September 5 through October 16, 1999
Inspectors:	Jennifer Dixon-Herrity, Senior Resident Inspector Peter Alter, Resident Inspector
Approved By:	Joseph I. Tapia, Chief, Project Branch A

ATTACHMENT: Supplemental Information

EXECUTIVE SUMMARY

Grand Gulf Nuclear Station
NRC Inspection Report No. 50-416/99-16

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection.

Operations

- Safety-related areas of the plant were maintained in good condition (Section O2.1).

- The suppression pool makeup system was correctly aligned and maintained in good material condition. Train A of this system was being tracked as (a)(1) under the Maintenance Rule as a result of exceeding the unavailability goal due to poor maintenance planning (Section O2.2).

- The licensee's use of overtime was consistent with regulatory requirements and licensee administrative procedures (Section O6.1).

Maintenance

- The 11 maintenance and testing activities observed were well conducted, with the exception of the postmaintenance test for the reactor core isolation cooling system outage. The procedure did not take system valve interlocks into account and, as a result, the test would not work as written. This resulted in a 24-hour delay in returning the system to service (Section M1.1).

Engineering

- The inspectors identified a potential limitation in the licensee's primary coolant sources outside containment leakage control program. The program did not require the quantification of the total leakage into a room to determine whether the prioritization of individual identified leaks was appropriate to minimize leakage to as-low-as-practicable levels (Section E3.1).

- The inspectors found that the scope and corrective actions of the condition report documenting the failure to meet NRC commitments in regard to potential standby service water water hammer concerns were limited. The condition report did not include potential water hammer concerns in the standby service water line to the drywell purge compressors, although references identified in the condition report indicated that the problem existed. The operating procedures for the standby service water system and the drywell purge system did not contain precautions or references to the potential for water hammer. Although the concern was addressed in procedures for chemical addition to standby service water, it was not included in the system operating procedures. As a result, operators did not take precautions to minimize the operation of the purge compressors during testing in order to limit the potential for water hammer in the system in the event of a loss of offsite power (Section E7.1).

Plant Support

- Observed activities involving radiological controls were well performed (Section R1.1).

Report Details

Summary of Plant Status

The plant operated at 100 percent power throughout the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspectors performed control room observations to assess operator knowledge and performance. Operations shift turnovers and shift briefs were thorough and well conducted. Operators were knowledgeable of the status of equipment, and applicable Technical Specification limiting conditions for operations were appropriately entered.

O2 Operational Status of Facilities and Equipment

O2.1 Plant Tours

a. Inspection Scope (71707)

The inspectors conducted tours through safety-related portions of the plant.

b. Observations and Findings

The areas of the plant that were toured were maintained in good condition. The following minor observations were made during the tours and were adequately addressed by the licensee.

During a tour on September 22, 1999, the inspectors observed that the temperature and humidity in the reactor core isolation cooling (RCIC) pump room were increasing. The inspectors found that the packing on the trip/throttle valve was leaking such that a pool of water had accumulated on the floor. The licensee planned to eliminate the packing leak by taking the system out of service on October 4, 1999, to repair a leaking upstream valve. The inspectors reviewed how this leak had been quantified in the licensee's leakage control program. This is further discussed in Section E3.1.

During a tour of containment on September 23, 1999, the inspectors observed a rubber glove and a red cap floating in the suppression pool. In addition, there were patches of scum and bubbles floating on the surface of the pool. The inspectors reported the glove and cap and questioned why the water quality appeared degraded. The shift superintendent initiated a condition report to remove the glove and cap. The bubbles and scum were determined to be the result of a bacterial growth in the water. The growth had resulted because the suppression pool cleanup system had been out of service for maintenance. The water degradation was not such that it would affect the ability of the essential core cooling systems to perform their safety function.

c. Conclusions

Safety-related areas of the plant were maintained in good condition.

O2.2 Engineered Safety Feature System Walkdown

a. Inspection Scope (71707)

The inspectors conducted daily control board walkdowns to verify that engineered safety feature systems were aligned as required by Technical Specifications for the existing operating mode, that instrumentation was operating correctly, and that power was available. The inspectors performed a more detailed walkdown of accessible portions of the suppression pool makeup system to independently verify its operability and configuration. During this review, the inspectors reviewed Instruction 04-01-1-1E30-1, "Suppression Pool Makeup System," Revision 21, and P&ID M-1096, "Suppression Pool Makeup System - Unit 1," Revision 18.

b. Observations and Findings

Equipment operability, material condition, and housekeeping for the suppression pool makeup system were well maintained. The inspectors verified that the system was properly aligned for the existing mode of operation. The inspectors reviewed the maintenance records and the system engineer's quarterly status and found that there were no significant maintenance concerns open for the system. In reviewing the Maintenance Rule availability tracking for the system, the inspectors observed that both trains had exceeded the availability goals identified by the licensee for the year. The system engineer explained that this had happened in the third quarter of the year, but had not been updated on the quarterly status. The system was now considered to be in Category (a)(1) of the Maintenance Rule and would be tracked as 'red' in the annunciator window when the system was updated.

The system engineer could not readily explain why the goals had been exceeded. The inspectors determined that the system had been taken out of service for modifications and preventive maintenance on the motor-operated valve actuators but, as a result of poor planning, the work was not started immediately. This resulted in exceeding the expected unavailability goal of 44 hours by 19.75 hours for Train A. The subsequent modifications to Train B actuators resulted in exceeding the unavailability goal by 3 hours. The exceeded goals were not identified until the maintenance rule coordinator documented them in a condition report about one month after the work was done. Train B was not considered in Category (a)(1) because the 3-year average for unavailability was 29.2 hours.

The inspectors noted that it took a month for Train A to be identified as a system that belonged in Category (a)(1) and that the system engineer was not tracking this information. The system engineering superintendent explained that this was not currently an expectation for the system engineers. The Maintenance Rule coordinator was responsible for all aspects of the Maintenance Rule. However, this program was in the process of being revised. The system engineers were to start getting more involved

with the Maintenance Rule program as a result of company-wide changes being made in this area. The superintendent explained that, during the next 2 years, the system engineers would begin tracking the unavailability time and become more involved with the Maintenance Rule as it pertained to their respective systems.

c. Conclusions

The suppression pool makeup system was correctly aligned and maintained in good material condition. Train A of this system was being tracked as (a)(1) under the Maintenance Rule as a result of exceeding the unavailability goal because of poor maintenance planning.

O6 Operations Organization and Administration

O6.1 Use of Overtime

a. Inspection Scope (71707)

The inspectors reviewed the licensee's use of overtime for licensed operators and others engaged in safety-related activities.

b. Observations and Findings

As a result of a number of examination failures discussed in NRC Report 50-416/99-10, the inspectors reviewed the amount of overtime used by reactor operators and nonlicensed operators between July 25 and September 30, 1999. Although there were periods of time where individuals worked close to the overtime limits identified in Technical Specification 5.2.2.e., these limits were never exceeded. The inspectors observed that the overtime was broken up so it was worked by a number of individuals, and weeks with a larger amount of overtime were followed by a break or a week with a lower amount of overtime.

c. Conclusions

The licensee's use of overtime was consistent with regulatory requirements and licensee administrative procedures.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance and Surveillance Observations

a. Inspection Scope (61726, 62707)

The inspectors observed all or portions of the maintenance, surveillance, and test activities listed below. Maintenance work was reviewed to ensure that adequate work

instructions were provided, that the work performed was within the scope of the authorized work, and that the work performed was adequately documented. For surveillances, the test procedures were reviewed and compared to the Technical Specification surveillance requirements and bases to ensure that the procedures satisfied the requirements. In all cases, the impact to equipment operability and applicability of Technical Specification actions were independently verified. The following are the maintenance action items and surveillance tasks observed:

Maintenance:

- 263926 Division III diesel generator replacement
- 253466 Replace current transformers on control rod drive Pump B breaker
- 263475 Check Division III diesel lube oil consumption during 24-hour run
- 219355 Replace current transformers on residual heat removal Pump C breaker
- 265115 Troubleshoot RCIC exhaust Valve 1E51F068
- 265148 Troubleshoot drywell purge standby service water (SSW) stop check Valves 1P41F169A/B

Surveillance/Test:

- 06-OP-1P41-Q-0004 SSW Loop A Valve and Pump Operability Test
- 06-OP-1P81-R-0001 High Pressure Core Spray (HPCS) Diesel Generator 18-Month Functional Test
- 17-S-06-22 SSW A Performance
- 1P81-99-001-O-S HPCS Diesel Generator Acceptance Test
- 1P81-99-002-O-S Reset HPCS Diesel Generator Bearing Temperature Alarm
- 04-1-01-E51-1 RCIC System

b. Observations and Findings

The inspectors observed that the work performed during these activities was well conducted, with one exception. In response to a request from the system engineer, operators added steps to Instruction 04-1-01-E51-1, "Reactor Core Isolation Cooling System", Revision 112, to allow for a slow roll startup of the RCIC turbine. This revision was made as a corrective action in response to the failure to properly fill and vent the governor oil system in December 1998. The procedure was written to verify that the governor portion of the oil system was adequately filled and vented before starting the system following maintenance. When operators tried to slowly roll the turbine using the steam bypass Valve 1E51F095 in accordance with the procedure, the turbine did not reach the required minimum operating speed in the procedure. The RCIC system was secured and personnel determined that the procedure would not work as written. An interlock between steam admission Valve 1E51F045 and the RCIC speed control system ramp generator maintained the governor valve closed until Valve 1E51F045 started to open. The plant supervisor wrote Condition Report CR-GGN-99-1217 to document the error, and the corrected procedure was approved the following morning.

The RCIC turbine slow roll was completed successfully using Valve 1E51F045 and the system was declared operable on September 16, 1999.

c. Conclusions

The 11 maintenance and testing activities observed were well conducted, with the exception of the postmaintenance test for the RCIC outage. The procedure did not take system valve interlocks into account and, as a result, the test would not work as written. This resulted in a 24-hour delay in returning the system to service.

III. Engineering

E3 Engineering Procedures and Documentation

E3.1 Leakage Control Program

a. Inspection Scope (37551)

The inspector reviewed the licensee's leakage control program to determine how an RCIC system leak should be addressed. In conducting this review, the inspectors reviewed Procedures 01-S-06-16, "Water Control and Leak Reduction Program," Revisions 1 and 101; 06-OP-1000-Q-0003, "Leakage Reduction Program System Walkdown," Revision 24; and 17-S-05-101, "Leakage Reduction Program," Revision 0.

b. Observations and Findings

While touring the RCIC room, the inspectors noted that leakage through the trip throttle and governor valves had increased. The inspectors noted that the licensee had an outage scheduled for October 4, 1999, and planned to replace a valve, upstream of the trip throttle and governor valves, which was leaking by the seat and allowing the observed leakage. During an accident where the RCIC system was required to operate, the leakage that had been observed from the trip throttle and governor valves would be eliminated by the gland seal condenser. However, the inspectors questioned if the total system leakage was being quantified. Technical Specification 5.5.2 required that the licensee maintain a program to minimize leakage from primary coolant sources outside containment. The inspectors noted that, in addition to the trip/throttle and governor valve leakage, three other valves in the RCIC system were documented to be leaking in the maintenance tracking program.

When the program was initially reviewed by the NRC, documented in NRC Inspection Report 50416/83-56, the inspectors noted that the procedures at the time required that each identified leak in the affected systems was to be given the highest priority for repair. In the current program, each leak was prioritized in accordance to its severity. The inspectors questioned whether the total leakage in a room was trended to determine if the effect of the total leakage was at a higher priority or had the potential to have a greater affect on the accident environment in the room. The engineering supervisor responsible for the testing portion of the leakage control program explained

that he was not aware that any trending was done. Leak testing was performed every 18 months on the systems included in the program. Operations personnel regularly toured the rooms between tests and were required to document system leakage. Although there was no requirement to track the total leakage, the potential exists that the total leakage from a system or into a room could be a problem, whereas the individual leaks were not. The inspectors did not identify any examples where this procedure limitation allowed a condition that was of concern.

c. Conclusions

The inspectors identified a potential limitation in the licensee's primary coolant sources outside containment leakage control program. The program did not require the quantification of the total leakage into a room to determine whether the prioritization of individual identified leaks was appropriate to minimize leakage to as-low-as-practicable levels.

E7 Quality Assurance in Engineering Activities

E7.1 Drywell Purge Compressor Water Hammer Concerns

a. Inspection Scope (37551)

The inspectors reviewed Condition Report CR-GGN-1999-1003 which identified the failure of the licensee to meet commitments made to the NRC for water hammer concerns, the immediate corrective actions taken, and the background behind the concern.

b. Observations and Findings

On September 1, 1999, engineering personnel initiated Condition Report CR-GGN-1999-1003 to address that the system operating instructions did not satisfy commitments to the NRC to minimize the time the SSW system was aligned to the fuel pool cooling and cleanup (FPCC) in order to limit the possibility of an SSW system water hammer. The inspectors reviewed Letters AECM 87/0095, AECM 88/0045, and AECM 89/0014. The water hammer concern identified in these letters dealt with the FPCC system and the drywell purge system. The licensee reported, in Licensee Event Report 86-029-08, that a potential for water hammer existed if a loss of offsite power and/or loss of coolant accident occurred while the SSW system was in operation and the drywell purge compressor or FPCC heat exchanger isolation valves were open. To limit this concern, the licensee committed in the licensee event report to minimize the time that SSW was aligned to the drywell purge compressors or the FPCC heat exchangers.

The inspectors reviewed Instructions 04-1-P41-1, "Standby Service Water System," Revision 107, and 04-1-01-E61-1, "Combustible Gas Control System," Revision 34, and Procedures 06-OP-1E61-Q-0003, "Drywell Purge System Operability," Revision 102; 06-OP-1P41-M-0004(5), "SSW Loop A(B) Operability Check," Revision 102(104), 06-OP-1P41-Q-0004(5), "SSW Loop A(B) Valve and Pump Operability Test,"

Revision 106(108); and 04-1-03-P41-1(2), "SSW A(B) Chemical Addition Run," Revision 2(0). Neither the letters nor the water hammer concern were referenced in any of the procedures reviewed.

In Letter GNRO-95/00019, the licensee forwarded the final report for the SSW operational performance inspection that a contractor had conducted. In Section 9.1 of the report, they identified that the procedural changes discussed in AECM-87/0095 and AECM-88/0045 had not been made. The report indicated that the issue had been reevaluated in response to the need to conduct frequent chemical treatment runs. The report also documented that station personnel had initiated a procedure change request to add the AECMs to the Requirements Cross-Reference List in the SSW system operating instructions and the chemical addition procedures. The inspectors did not find any reference to the AECMs in the procedures. The inspectors discussed this evaluation with chemistry personnel. The available documentation indicating the issue had been addressed was in internal Letter GIN 91-01324, dated March 4, 1991. The letter stated that the drywell purge compressor heat exchanger was not to be started up with the other components for the 24-hour run because of the potential for water hammer and that it would be started up with components receiving an 8-hour run for convenience.

The inspectors asked the engineer who initiated the report why the drywell purge compressors had not been included in the condition report dealing with the FPCC heat exchangers. The engineer explained that the drywell purge compressors were not run during normal operation, whereas the FPCC heat exchangers were being run with SSW supplying the cooling. Actions were taken to address the drywell purge compressors in the chemical addition program. Also, the loads associated with a water hammer in the 8-inch FPCC system would be 10 times the load on the 1- to 2-inch line in the drywell purge cooling line. The inspectors explained that the actions taken were limited and that there was still a need to inform operators of the concerns through the procedures to ensure that system runtime was minimized during surveillances and other situations where there would be a need to run the drywell purge system. The licensee planned to enhance the procedures to address the concern in a corrective action in response to Condition Report CR-GGN-1999-1003.

c. Conclusions

The inspectors found that the scope and corrective actions of the condition report documenting the failure to meet NRC commitments in regard to potential SSW water hammer concerns were limited. The condition report did not include potential water hammer concerns in the SSW line to the drywell purge compressors, although references identified in the condition report indicated that the problem existed. The operating procedures for the SSW system and the drywell purge system did not contain precautions or references to the potential for water hammer. Although the concern was addressed in procedures for chemical addition to SSW, it was not included in the system operating procedures. As a result, operators did not take precautions to minimize the operation of the purge compressors during testing in order to limit the potential for water hammer in the system in the event of a loss of offsite power.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Outage Preparations

a. Inspection Scope (71750)

The inspectors conducted tours of safety-related areas and observed radiation protection activities.

b. Observations and Findings

During tours of the radiologically controlled area, the inspectors observed radiological posting and worker adherence to radiation protection procedures. Personnel followed radiation protection procedures and locked high radiation doors were locked. The inspectors observed that the licensee improved controls on the controlled access area control point in preparation for the outage. Health physics technicians were providing closer, more detailed coverage of the personnel and tool monitors. The space provided for decontamination was outfitted so as to provide better support for decontamination of personnel.

c. Conclusions

Observed activities involving radiological controls were well performed.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on October 20, 1999. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Bottemiller, Manager, Plant Licensing
R. Carroll, Superintendent, Operations
B. Edwards, Manager, Planning and Scheduling
C. Ellsaesser, Manager, Corrective Action and Assessment
C. Lambert, Director, Design Engineering
J. Roberts, Director, Quality Programs
C. Stafford, Manager, Plant Operations
J. Venable, General Manager, Plant Operations

NRC

P. Sekerak, NRR Project Manager

INSPECTION PROCEDURES USED

37551	Onsite Engineering
61726	Surveillance Observations
62707	Maintenance Observation
71707	Plant Operations
71750	Plant Support Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None