UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-4005

October 23, 2003

Mr. Jeff Forbes
Vice President, Nuclear Operations
Grand Gulf Nuclear Station
Entergy Operations, Inc.
P.O. Box 756
Port Gibson, Mississippi 39150

SUBJECT: GRAND GULF NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000416/2003003

Dear Mr. Forbes:

On September 27, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Grand Gulf Nuclear Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on September 30, 2003, with you and other members of your staff.

The 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. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. There was one finding of very low safety significance (Green) identified in the report.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) 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).

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

Sincerely,

/RA/

William D. Johnson, Chief
Reactor Projects Branch A
Division of Reactor Projects

Docket: 50-416
License: NPF-29

Enclosure:
Inspection Report 050000416/2003003
w/Attachment: Supplemental Information

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ADAMS: √ Yes ☐ No Initials: __WDJ_
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RIV:RI:DRP/A	SRI:DRP/A	PE:DRP/A	SPE:DRP/A	C:DRS/PSB
RWDeese	TLHoeg	JMKeeton	TRFarnholtz	TWPruitt
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	50-416
License No.:	NPF-29
Report No.:	050416/2003003
Licensee:	Entergy Operations, Inc.
Facility:	Grand Gulf Nuclear Station (GGNS)
Location:	Waterloo Road Port Gibson, Mississippi 39150
Dates:	June 29, 2003 - September 27, 2003
Inspectors:	T. L. Hoeg, Senior Resident Inspector R. W. Deese, Resident Inspector J. M. Keeton, Project Engineer B. J. Nicholas, Senior Health Physics Inspector P. J. Elkmann, Emergency Preparedness Inspector, Team Leader R. E. Lantz, Senior Emergency Preparedness Inspector P. A. Goldberg, Senior Reactor Inspector G. F. Larkin, Resident Inspector M. P. Shannon, Senior Health Physics Inspector
Approved By:	W. D. Johnson, Chief Reactor Projects Branch A Division of Reactor Projects
Attachment:	Supplemental Information

Enclosure

SUMMARY OF FINDINGS

IR 05000416/2003-003; 6/29/02 - 9/27/03; Grand Gulf Nuclear Station; Problem Identification and Resolution.

The report covered a 13-week period of inspection by resident inspectors and announced inspections by Division of Reactor Safety inspectors. One Green finding was identified. The significance of most findings are indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609 "Significance Determination Process". Findings for which the SDP 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: Initiating Events

- Green. The inspector identified a self revealing finding because identification and resolution of a single failure vulnerability associated with the condensate system demineralizer isolation control circuit was inadequate and contributed to a loss of feedwater event and reactor scram. The licensee documented this finding in their corrective action program in condition report GGNS-CR-2003-300.

  The finding is greater than minor because it was viewed as a precursor to a significant event and increased the likelihood of an initiating event such as a reactor scram. The finding is of very low safety significance because, although it caused a loss of feedwater event, it did not contribute to the likelihood of a primary or secondary system loss of coolant accident initiator; did not contribute to a combination of a reactor trip and loss of mitigation equipment functions; and it did not increase the likelihood of a fire or internal/external flood (Section 4OA2).

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Grand Gulf Nuclear Station (GGNS) began the period at full Rated Thermal Power (RTP) and operated at or near full power for the entire report period, except for planned short term power reductions of less than 48 hours to 60 percent RTP on August 10, 2002, for maintenance on high pressure drain pump A; to 60 percent RTP on September 12, 2003, to inspect a low pressure feedwater heater leak; to 80 percent RTP on September 27, 2003, for isolation and maintenance on the low pressure feedwater Heaters 3C and 4A respectively.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

Since sustained high temperatures were forecast in the vicinity of the facility during the month of August 2003, the inspectors reviewed one sample of hot weather protection equipment important to reactor safe shutdown capability. On July 30, 2003, the inspectors viewed portions of outside air ventilation system plenums and ducting for the standby service water pump structures and the emergency diesel generator rooms. The inspections verified ventilation fan housings, plenums, and ducting were in an unobstructed condition to ensure outside air ventilation would be available if required.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments

a. Inspection Scope

Partial System Walkdowns. The inspectors performed three partial system walkdowns of systems important to reactor safety during this inspection period in order to verify the operability of the system trains. The inspectors reviewed system operating instructions, required system valve and breaker lineups, operator logs, control room indications, valve positions, breaker positions, and control circuit indications to verify these components were in their required configuration for operability. The following walkdown inspections were conducted:

- On July 15, 2003, an inspector walked down Train A of the residual heat removal system while the residual heat removal Pump B motor was out of service for maintenance.

- On July 22, 2003, an inspector walked down Train B of the standby service water system while Train A was out of service for maintenance.

- On August 19, 2003, an inspector walked down the Division II emergency diesel generator while Division I was out of service for maintenance.

Complete System Walkdown. The inspectors conducted a detailed review of the alignment and condition of the residual heat removal system Train B while Train C was out of service for maintenance to determine if there were any discrepancies between the actual equipment alignment versus what was procedurally required. During the walkdown, System Operating Instruction 04-1-01-E12-1, "Residual Heat Removal System," Revision 105, was used by the inspectors to verify major system components were correctly labeled and aligned. The inspectors also reviewed open condition reports (CRs) on the system for any deficiencies that could affect the ability of the system to perform its design function. Documentation associated with control room deficiencies, temporary modifications, operator workarounds, and items tracked by plant engineering were also reviewed to assess their collective impact on system operation.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

Quarterly Tours. The inspectors reviewed area fire plans and performed walkdowns of six plant areas to assess the materiel condition and operational status of fire detection and suppression systems and equipment; the materiel condition of fire barriers; and the control of transient combustibles. Specific risk-significant plant areas included:

- Residual heat removal Train A piping room, Room 1A203
- Computer and control panel room, Room 0C403
- Division II electrical penetration room, Room 1A407
- Fuel Pool Cooling and Cleanup Pump Room 1A432
- Division I Emergency Diesel Generator Room 1D302
- Reactor Water Cleanup Room A 1A209

b. Findings

No findings of significance were identified.

1R06 Flood Protection

a. Inspection Scope

On September 15, 2003, the inspector reviewed internal flooding protection features and off-normal event Procedure 05-1-02-VI-1, “Flooding,” Revision 102, dealing with the potential flooding of the residual heat removal System C pump area while the sump pumps were tagged out of service for maintenance. The inspectors reviewed internal flooding vulnerabilities and the protective features installed to mitigate the impact of any flooding.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

On August 8, 2003, the inspectors observed one simulator scenario during licensed operator requalification annual examination to assess the licensee's effectiveness in conducting the requalification program and to verify that licensed individuals were appropriately evaluated. The inspectors also observed the post-examination critique conducted by the evaluators to verify that weak areas observed during simulator operations were appropriately identified.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed performance-based problems involving two selected in-scope structures, systems, or components (SSCs) to assess the effectiveness of the Maintenance Rule Program. Reviews focused on: (1) proper Maintenance Rule scoping in accordance with 10 CFR 50.65; (2) characterization of failed SSCs; (3) safety significance classifications; (4) 10 CFR 50.65 (a)(1) and (a)(2) classifications; and, (5) the appropriateness of performance criteria for SSCs classified as (a)(2), and goals and corrective actions for SSCs classified as (a)(1). Also, the inspectors reviewed the system functional failures for the last two years. The following systems were reviewed:

- Remote Shutdown System C61
- Reactor Water Cleanup System G33

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

Throughout the inspection period, the inspectors reviewed weekly and daily work schedules to determine when risk-significant activities were scheduled. The inspectors discussed five selected activities with operations and work control personnel regarding risk evaluations and overall plant configuration control. The inspectors discussed emergent work issues with work control center personnel and reviewed the prioritization of scheduled activities. The inspectors verified the performance of plant risk assessments related to planned and emergent maintenance activities as required by 10 CFR 50.65(a)(4) and plant Procedure 01-S-18-6, "Risk Assessment of Maintenance Activities," Revision 1. Specific maintenance action items (MAI) and work orders (WO) reviewed during this period included:

- MAI 310528, Division II load shedding and sequencing panel electrical maintenance
- MAI 331947, Reactor core isolation cooling pump preventative maintenance
- WO 5826, Standby service water train A instrumentation and controls maintenance
- WO 27646, 208' containment building personnel airlock leakage testing
- WO 27679, Valve 1E12FO21 preventive maintenance

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-Routine Evolutions and Events

a. Inspection Scope

On September 12, 2003, the inspector observed operations personnel perform a planned nonroutine plant power reduction to 60 percent RTP in order to perform an inspection of a small leak on low pressure feedwater Heater 4A. The inspectors observed control room shift personnel performing the pre-evolution brief, establishing prerequisites, lowering reactor recirculation flow, procedural compliance, and that the expected results were obtained.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors selected four operability evaluations conducted by GGNS personnel during the report period involving risk-significant SSCs. The inspectors evaluated the technical adequacy of the operability determinations, determined whether appropriate compensatory measures were implemented, and determined whether GGNS personnel considered all other pre-existing conditions, as applicable. Additionally, the inspectors evaluated the adequacy of the GGNS's problem identification and resolution program as it applied to operability evaluations as specified in procedure 01-S-06-44, "Operability Assessment," Revision 105. Specific operability evaluations reviewed are listed below.

- CR-GGN-2003-2104, Containment/Drywell Isolation Control Fuses
- CR-GGN-2003-2238, SSW Basin Leakage
- CR-GGN-2003-2424, Regulatory Guidance 1.9 Compliance
- CR-GGN-2003-2679, Control Rod Number 28-53 Settling Time

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

a. Inspection Scope

During the week of September 22, 2003, the inspectors evaluated the identified operator workarounds and operation burdens for cumulative effects related to the following attributes: (1) the reliability, availability, and potential to mis-operate safety-related systems; (2) the ability of the operators to respond in a correct and timely manner to plant transients and accidents; and (3) the potential for increasing an initiating event frequency or affecting multiple mitigating systems. Also, the inspectors reviewed open condition reports in the corrective action program to verify that additional operator workarounds had not been overlooked.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.DS, Enclosure 2)

a. Inspection Scope

The inspectors reviewed procedures governing plant modifications to evaluate the effectiveness of the programs for implementing modifications to risk-significant systems, structures, and components, such that, these changes did not adversely affect the design and licensing basis of the facility. The inspectors reviewed eight permanent

plant modification packages (design change packages or notices), including associated documentation such as review screens and safety evaluations, to verify that they were performed in accordance with regulatory requirements and plant procedures. Procedures and modifications reviewed are listed in the attachment to this report.

The inspectors interviewed the cognizant design and system engineers for the identified modifications as to their understanding of the modification packages. The inspectors evaluated the effectiveness of the licensee's corrective action process to identify and correct problems concerning the performance of permanent plant modifications. In this effort, the inspectors reviewed the corrective action documents (Condition Reports) identified in the attachment to this report and the subsequent corrective actions pertaining to licensee-identified problems and errors in the performance of permanent plant modifications.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.ST)

a. Inspection Scope

The inspectors reviewed postmaintenance test procedures and associated testing activities for three selected risk-significant mitigating systems. In each case, the associated work orders and test procedures were reviewed against the attributes in Inspection Procedure 71111.ST to determine the scope of the maintenance activity and determine if the testing was adequate to verify equipment operability. The reviewed activities were:

- MAI 334198, Nuclear boiler system relay replacement
- WO 50326806, Division I emergency diesel generator maintenance
- WO 50325776, Division I standby service water system maintenance

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.ST)

a. Inspection Scope

The inspectors observed performance of surveillance test procedures and reviewed test data of five selected risk-significant SSCs to assess whether the SSCs satisfied the Technical Specifications (TS), the Updated Final Safety Analysis Report, the Technical Requirements Manual, and licensee procedural requirements; and to determine if the testing appropriately demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions. The following tests were inspected:

- 06-OP-1P41-Q-0004, "Standby Service Water Loop A Valve and Pump Operability Test," Revision 112
- 06-OP-1E12-Q-0007, "Low Pressure Core Spray/Residual Heat Removal Functional Test," Revision 107
- 06-OP-1P75-M-0001, "Division I Emergency Diesel Generator Functional Test," Revision 121
- 06-OP-1P81-R-0001, "Division III Emergency Diesel Generator 24 Hour Functional Test," Revision 111
- 06-ME-SP64-R-0045, "Ventilation System Fire Damper Inspection," Revision 105

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed one temporary alteration listed below to assess the following attributes: (1) the adequacy of the safety evaluation; (2) the consistency of the installation with the modification documentation; (3) the updating of drawings and procedures, as applicable; and (4) the adequacy of the post-installation testing.

- Temporary Alteration No. 2002-03, Drywell floor drain tank level control

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP1 Exercise Evaluation (71114.01)

a. Inspection Scope

The inspectors reviewed the objectives and scenario for the 2003 biennial emergency plan exercise to determine if the exercise would acceptably test major elements of the emergency plan. The scenario simulated a loss of simulator control room alarm annunciators, losses of vital power supplies and pump failures resulting in an inability to cool the reactor core, fission product barrier failures, core damage, and a radiological release to the environment through an unisolable leak in a steam line to demonstrate the licensee's capabilities to implement the emergency plan.

The inspectors evaluated exercise performance by focusing on the risk-significant activities of classification, notification, protective action recommendations, and offsite dose consequences in the following emergency response facilities:

- Simulator Control Room
- Technical Support Center
- Operations Support Center
- Emergency Operations Facility

The inspectors also assessed personnel recognition of abnormal plant conditions, the transfer of emergency responsibilities between facilities, communications, protection of emergency workers, emergency repair capabilities, and the overall implementation of the emergency plan.

The inspectors attended the post-exercise critiques in each of the above facilities to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management.

The licensee's exercise performance was evaluated against licensee procedures for classification, notification, protective action recommendations, and worker protection, against the requirements of 10 CFR 50.47(b) and Appendix E, and against the guidance of NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2. The licensee's critique was evaluated against the requirements of the licensee's corrective action procedure(s), and the requirements of 10 CFR 50.47(b)(14) and 10 CFR 50 Appendix E IV.F.2(g).

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors performed an on-site review of Revision 50 to the Grand Gulf Nuclear Station Emergency Plan, submitted June 11, 2003. The inspectors also reviewed Revision 110 to Emergency Plan Implementing Procedure 10-S-01-1, "Activation of the Emergency Plan," submitted June 18, 2003. The change to the Implementing Procedure reflected the changes to the Emergency Action Levels (EALs) contained in the change to the Emergency Plan. These EALs changes encompassed changes to security related EALs, some of which received prior NRC approval in a letter dated November 19, 2002. These revisions were compared to their previous revisions, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, and to the requirements of 10 CFR 50.47(b)(4) and 50.54(q) to determine if the revisions decreased the effectiveness of the plan.

b. Findings

No findings of significance were identified.

1EP6 Drill Observation (71114.06)

a. Inspection Scope

On July 9 and July 23, 2003, the inspectors observed a planned licensee emergency preparedness quarterly drill. The inspectors reviewed the drill scenario to determine if it reflected realistic plant configurations. The inspectors observed GGNS personnel at various locations during the exercise including the control room simulator, the Technical Support Center, the Emergency Operations Facility, and the Operations Support Center. The inspectors primarily focused on the ability of the emergency response organization to properly classify the simulated emergency through recognition of emergency action levels, their ability to activate the station emergency plan and procedures, and their ability to make proper and timely notifications as appropriate.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY
Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

To review and assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, and high radiation areas, the inspector interviewed supervisors, radiation workers, and radiation protection personnel that had the potential to be involved in high dose rate and high exposure jobs during routine and outage operations. The inspector discussed changes to the access control program with the Radiation Protection Superintendent. The inspector also conducted plant walkdowns within the controlled access area and conducted independent radiation surveys of selected work areas. The following items were reviewed and compared with regulatory requirements:

- Area postings, radiation work permits, radiological surveys, and other controls for airborne radioactivity areas, radiation areas, and high radiation areas
- High radiation area key control
- Internal dose assessment for exposures exceeding 50 mrem Committed Effective Dose Equivalent

- Setting, use, and response of electronic personal dosimeter alarms

- Conduct of work by radiation protection technicians and radiation workers in areas with the potential for high radiation dose and the associated radiation work permits, radiological surveys, and controls for the work associated with the spent fuel pool clean-up activities
  Dosimetry placement when work involved a significant dose gradient

- Controls involved with the storage of highly radioactive items in the spent fuel pool

- Audits, Licensee Event Reports, special reports, and self-assessments involving high radiation area controls and staff performance

- Summary of corrective action documents written since the last inspection and selected documents relating to high radiation area incidents, radiation protection technician and radiation worker errors, repetitive and significant individual deficiencies.

Performance indicator reviews are documented in Section 4OA1 of this report. There were no ALARA pre-job briefings held for radiological significant work during the inspection.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

The inspector interviewed radiation protection personnel and radiation workers throughout the controlled access area and conducted independent radiation surveys of selected work areas to assess the licensee's performance against regulatory requirements in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, and high radiation areas; radiation worker practices; and work activity results; and to determine their knowledge of as low as is reasonably achievable (ALARA) practices. The inspector discussed changes and trends related to the ALARA program with the Radiation Protection Superintendent and the ALARA Planning Supervisor. The inspector attended the mock-up training and pre-job briefing for the removal and replacement of the Delta Transverse Incore Probe which was controlled by Radiation Work Permit (RWP) 2003-1054, Task 1.

The inspector interviewed radiation protection staff and other radiation workers to determine the level of planning, communication, ALARA practices, and supervisory oversight integrated into work planning and work activities. The inspector reviewed initial and emergent work scopes and estimated man-hour information provided to the radiation protection group for accuracy. In addition, the following radiation protection program

controls, planning, and preparation items were reviewed and compared with regulatory requirements to assess whether the licensee had an adequate program to maintain occupational exposure ALARA during the recently completed refueling outage RF12:

- ALARA program procedures
- Processes, methodology, and bases used to estimate, justify, adjust, track, and evaluate personnel exposures
- Plant collective exposure history for the past three years, current exposure trends, source term measurements, and 3-year rolling average dose information
- Radiation protection refueling outage RF12 critique and exposure data
- ALARA and radiological work planning, in-progress reviews, and post-job reviews for three RWP packages that resulted in some of the highest personnel collective exposures during refueling outage RF12
- Incorporation of post-job review identified problems from three RWP packages into the licensee's corrective action program
- Work activities and performance of workers utilizing low dose waiting areas during the removal and replacement of the Delta Transverse Incore Probe
- Supervisor oversight of on-the-job ALARA requirements during the removal and replacement of the Delta Transverse Incore Probe
- Hot spot tracking and reduction program including inspection and posting verification of nine hot spots throughout the controlled access area
- Use and results of administrative and engineering controls to achieve dose reductions, including five temporary shielding request (TSR) packages planned and installed during refueling outage RF12
- 2003 year-to-date individual exposures of selected work groups (radiation protection, operations, mechanical maintenance, and instruments and controls)
- Plant related source term evaluation and control/reduction strategy
- Declared pregnant worker and embryo/fetus dose evaluation, monitoring, and controls
- ALARA Committee and ALARA Sub-Committee meeting minutes
- Quality Assurance Audit Report (QA-14-2003-GGNS-1) which evaluated the radiation protection program and included an overview of the ALARA program

- Quality Assurance Surveillance Report (QS-2003-GGNS-003) which evaluated RWP revision justifications

- Radiation protection department self-assessment “ALARA Planning and Controls,” which provided a comprehensive assessment of the ALARA program

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the period from July 2002 through June 2003. In order to verify the accuracy of the PI data reported during the period, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2, were used to verify the basis in reporting for each element.

Mitigating Systems Cornerstone

The inspectors reviewed operator log entries, chemistry log entries, daily shift manager reports, plant computer data, condition reports, maintenance action item paperwork, maintenance rule data, and PI data sheets to determine whether the licensee adequately verified the three PIs listed below during the previous four quarters. This number was compared to the number reported for the PI during the current quarter. Also, the inspectors interviewed licensee personnel responsible for compiling the information.

- Emergency AC Power System Unavailability
- High Pressure Injection System Unavailability
- Heat Removal System Unavailability

Occupational Radiation Safety Cornerstone

The inspector reviewed corrective action program records involving locked high radiation areas (as defined in Technical Specification 5.7.2), very high radiation areas (as defined in 10 CFR 20.1003), and unplanned exposure occurrences (as defined in NEI 99-02) for the past 12 months to confirm that these occurrences were properly recorded as performance indicators. Radiological controlled area entries with exposures greater than 100 millirems within the past 12 months were reviewed, and selected examples were examined to determine whether they were within the dose projections of the governing radiation work permits. Whole body counts or dose estimates were reviewed if radiation workers received committed effective dose equivalents of more than 100 millirems.

Where applicable, the inspector reviewed the summation of unintended deep dose equivalent and committed effective dose equivalent to verify that the total effective dose equivalent did not surpass the performance indicator threshold without being reported.

- Occupational Exposure Control Effectiveness

Public Radiation Safety Cornerstone

The inspector reviewed radiological effluent release program corrective action records, licensee event reports, and annual effluent release reports documented during the past four quarters to determine if any doses resulting from effluent releases exceeded the performance indicator thresholds as defined in NEI 99-02.

- Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences

Emergency Preparedness Cornerstone

The inspectors reviewed a sampling of drill and exercise scenarios, licensed operator simulator training sessions, notification forms, and attendance and critique records associated with training sessions, drills, and exercises conducted during the verification period. The inspectors reviewed selected emergency responder qualification, training, and drill participation records. The inspectors reviewed siren test, maintenance records, and procedures. Performance indicator data were also reviewed against the requirements of Emergency Preparedness Instruction 10-S-04-4, "Performance Indicators," Revision 4. The inspectors also interviewed licensee personnel that were accountable for collecting and evaluating the PI data.

- Drill and Exercise Performance
- Emergency Response Organization Drill Participation
- Alert and Notification System Reliability

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

1. Annual Sample Review

Resident Inspector Sample

a. Inspection Scope

The inspectors chose one selected issue for followup inspection. The issue was associated with the manual reactor scram which occurred on January 30, 2003, documented in LER 2003-01. The inspectors reviewed the issue to ensure that the full

extent of the condition was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the condition reports against the requirements of the licensee's corrective action program as delineated in administrative procedure LI-102, “Corrective Action Process,” Revision 2 and Root Cause Evaluation Report CR-GGN-2003-300.

b. Findings and Observations

Introduction. A Green self-revealing finding was identified for several missed opportunities to correct a condition which resulted in a loss of feedwater initiating event and reactor scram.

Description. On January 30, 2003, a loss of feedwater event occurred while performing maintenance on one of eight condensate system demineralizer inlet valves (1N22-FO45G). The operators manually scrammed the reactor prior to reaching the automatic scram set point for reactor vessel water level. The high pressure core spray system and the reactor core isolation cooling system automatically initiated as designed and injected into the reactor vessel to restore level.

The licensee’s investigation determined that the design of the condensate system demineralizer isolation valve control circuitry was not single failure proof. A common power supply breaker supplied all eight inlet isolation valve position indication circuits. When the breaker tripped, all inlet isolation valves indicated closed and the design of the system control logic closed all of the demineralizer outlet isolation valves resulting in a total loss of feedwater flow to the reactor. The licensee determined that the event was attributed to the common power supply breaker opening on over current due to a ground caused by a wire contacting its conduit in the isolation inlet valve under maintenance. The licensee's root cause evaluation report CR-GGN-2003-300 identified the following missed opportunities which may have prevented the initiating event at GGNS:

- In July 2001 while performing maintenance on the 1N22-FO45A valve, a wiring short circuit in the form of an electrical arc was observed during reinstallation of the valve position indicator. The flex conduit and wiring was repaired but no condition report or evaluation was performed to prevent similar future occurrences.

- In April 1999, the Limerick Nuclear Station had a very similar event occur. GGNS did not perform a review and evaluation of the event to address the same single failure vulnerability at GGNS.

- In 1987 a proposed design change (DCP 83-3037) to eliminate the power supply single failure vulnerability was canceled. The reason for the cancellation was because the modification was considered only an enhancement to the limit switch indicating circuit but included no technical justification.

Analysis. The performance deficiency associated with this finding was the failure of GGNS to identify, evaluate, and resolve a single failure vulnerability associated with the design of the condensate demineralizer system isolation valve control circuitry. The

finding was greater than minor because it was viewed as a precursor to a significant event and increased the likelihood of an initiating event such as a reactor scram. The finding which is under the initiating events cornerstone was only of very low safety significance because it did not contribute to the likelihood of a primary or secondary system loss of coolant accident initiator; did not contribute to both the likelihood of a reactor trip and mitigation equipment being unavailable; and it did not increase the likelihood of a fire or flooding as described in the significance determination process Phase 1 screening worksheet for the initiating event cornerstone. This finding is in the GGNS corrective action program as condition report number 2003-300.

Enforcement. No violation of regulatory requirements occurred. The inspectors determined that the finding did not represent a noncompliance because it occurred on non-safety secondary plant equipment.

Access Control to Radiologically Significant Areas

a. Inspection Scope

Section 2OS1 evaluated the effectiveness of the licensee's problem identification and resolution processes relating to radiation area incidents, radiation protection technician and radiation worker errors.

b. Findings

No findings of significance were identified.

ALARA Planning and Controls

a. Inspection Scope

The inspector reviewed the licensee's audit program's scope and frequency to determine if 10 CFR 20.1101(c) requirements were met as discussed in Section 2OS2. The inspector interviewed staff members and reviewed a summary list of ALARA related condition reports written since the previous inspection of this area in November 2002. Selected condition reports involving exposure tracking, higher than planned exposure levels, and radiation worker performance and radiation protection practices were reviewed to determine if identified problems were properly characterized, prioritized, and timely and effectively resolved. The selected corrective action documents are listed in the attachment to this inspection report. In addition, the inspector reviewed corrective action documentation for repetitive deficiencies and significant individual deficiencies for identification and resolution. The inspector used regulatory and procedural requirements as criteria for determining the adequacy of the licensee's problem identification and resolution results.

b. Findings and Observations

No findings or observations of significance were identified.

Emergency Preparedness

a. Inspection Scope

The inspectors reviewed performance and facility problems documented in calendar years 2002 and 2003 in the licensee's corrective action program, emergency preparedness action tracking system, audits, and drill reports. The inspectors selected 25 items to verify effective corrective action through observation during the evaluated exercise.

b. Findings and Observations

The inspectors identified the following recurring performance problems: (1) command-and-control in one emergency response facility was weak, (2) one emergency response facility was not operational in a timely manner, and (3) personnel in one emergency response facility did not follow the procedure for issuing potassium iodide to emergency workers. The licensee's evaluation identified two of the recurring problems but did not identify the failure to follow the procedure to issue potassium iodide.

The inspectors also identified that the critique of the backup method for notifying offsite authorities following declaration of the Site Area Emergency classification was incomplete in that the licensee incorrectly used the performance indicator threshold of initiating notification to the first in a series of offsite agencies within 15 minutes to limit their critique. The licensee did not evaluate the specific times at which the remaining notifications were performed and did not evaluate whether problems other than the number of available communicators contributed to the observed notification times.

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

None

4OA3 Event Followup

(Closed) LER 05000416/200303-00, Reactor Scram Due to a Loss of Feedwater Flow

On January 30, 2003, the licensee experienced an unplanned manual scram following a loss of feedwater event. The manual scram was initiated due to decreasing reactor water level when all condensate demineralizers were automatically isolated due to a wire shorting to ground and tripping of a power supply breaker. The LER was reviewed by the inspectors and no findings of significance were identified. The licensee documented problems associated with the scram in their corrective action program as condition report CR-GGN-2003-300. The inspectors reviewed the licensee's identification and resolution of problems from this event per Inspection Procedure 71152 and documented their findings in section 4OA2 of this report. This LER is closed.

4OA6 Meetings, including Exit

On July 24, 2003, the inspector presented the access controls inspection results to Mr. G. Williams, Vice-President, Operations and other members of his staff. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On August 15, 2003, the inspectors presented the permanent plant modifications inspection results to Mr. B. Edwards, General Manager, and other members of licensee management at the conclusion of the inspection.

On August 29, 2003, the inspector presented the inspection results for the review of the ALARA planning and controls program to Mr. J. Forbes, Vice President, Operations, and other members of his staff. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On September 18, 2003, the inspectors presented the emergency preparedness exercise inspection results to Mr. J. Forbes, Site Vice President, and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

On September 30, 2003, the senior resident inspector presented the inspection results to Mr. J. Forbes, Vice President, Operations and other members of the GGNS staff.

The inspectors confirmed that proprietary information was not provided or examined during the inspections.

4OA7 Licensee-Identified Violations

None

ATTACHMENT: SUPPLEMENTAL INFORMATION

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

D. Barfield, Manager, System Engineering
C. Bottemiller, Manager, Plant Licensing
B. Bryant, Supervisor, Chemistry
K. Christian, Superintendent, Mechanical Maintenance
J. Edwards, General Manager, Plant Operations
C. Ellsaesser, Manager, Planning and Scheduling
R. Green, Acting Manager, Training
M. Guynn, Manager, Emergency Preparedness
C. Holifield, Senior Licensing Engineer
M. Larson, Senior Licensing Engineer
R. Moomaw, Manager, Outage Planning and Scheduling
L. Patterson, Manager, Site Business Services
J. Roberts, Director, Nuclear Safety Assurance
J. Robertson, Manager, Quality Assurance
M. Rohrer, Manager, Maintenance
G. Sparks, Manager, Operations
W. White, Manager, Materials, Procurement, and Contracts
G. Williams, Vice President, Operations
D. Wiles, Director, Engineering
R. Wilson, Superintendent, Radiation Protection
H. Yeldell, Manager, Design Engineering

NRC personnel

D. Hickman, Performance Indicator Coordinator, NRR
B. Vaidya, Grand Gulf Project Manager, NRR
D. Dumbacher, Reactor Inspector, Division of Reactor Projects

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000416/2003-001-00	LER	Manual Reactor Scram do to a Loss of Feedwater

Opened and Closed

05000416/2003-003-01	FIN	Failure to Identify and Correct a Single Failure Vulnerability Resulted in a Reactor Scram

LIST OF DOCUMENTS REVIEWED

Procedures

Administrative Procedure 01-S-17-22, “Maintenance Rule Program,” Revision 3

Administrative Procedure 01-S-05-17Temporary Change Notice Process," Revision 106

Administrative Procedure LI-102, “Corrective Action Process,” Revision 2

Administrative Procedure LI-101, “10 CFR 50.59 Review Process,” Revision 2

Maintenance Procedure, "Troubleshooting," Revision 3

Maintenance Rule Desk Top Guide, Revision 1

GGNS Design Change Standard DCS-19, "Installation of Sacrificial Compression Fitting at Tubing Joints Requiring Frequent Remakes," Revision 0

Plant Operations Manual 02-S-01-13, "Operational Response to Sabotage/Tampering," Revision 2

Plant Operations Manual 08-S-04-220, "Ventilation Exhaust Gaseous Monitoring Systems Operation," Revision 107

Plant Operations Manual 10-S-01-29, "Operations Support Center Operations," Revision 19

06-OP-1P81-M-0002, “HPCS Diesel Generator 13 Functional Test,” Revision 116

CWS-17.0, “Criteria for Prevention of Potentially hazardous Seismic II/I Situations,” Revision 5

04-1-01-P81-1, “High Pressure Core Spray Diesel Generator Safety Related,” Revision 58

DC-112, “Engineering Request and Project Initiation Process,” Revision 2.

DC-113, “Grading," Revision 2

DC-115, “ER Response Development," Revision 3

DC-116, “ER Response Installation," Revision 1

DC-117, “Post Modification Testing and Special Testing Instructions," Revision 1

DC-118, “ER Response Closure," Revision 1

RP-105, Radiation Work Permits, Revision 4

RP-109, Hot Spot Program, Revision 0

RP-110, ALARA Program, Revision 1

RP-205, Prenatal Monitoring, Revision 2

08-S-01-28, Use and Control of Temporary Shielding, Revision 11

08-S-01-82, Radiological Controls for TIP Operations, Revision 3

10-S-01-01, “Activation of the Emergency Plan,” Revision 10

10-S-01-06, “Notification of Offsite Agencies and Plant on-call Emergency Personnel,” Revision 37

10-S-01-12, “Radiological Assessment and Protective Action Recommendations,” Revision 30

10-S-01-17, “Emergency Personnel Exposure Control,” Revision 16

10-S-01-20, “Administration of Thyroid Blocking Agent,” Revision 11

10-S-01-29, "Operations Support Center Operations," Revision 19

10-S-01-30, “Technical Support Center Operations,” Revision 11

10-S-01-33, “Emergency Operations Facility Operations,” Revision 11

Emergency Preparedness Instruction 10-S-04-4, “Performance Indicators,” Revision 4

Temporary Shielding Request (TSR) Packages

TSR 02-10 Reactor Cavity Bellows
TSR 02-11 B33 Recirculation Piping in the Drywell
TSR 02-12 Undervessel Shadow in the Drywell 105'
TSR 02-16 Annulus Shielding in the Drywell
TSR 02-23 Drywell 139' Mezzanine at E51-F076 and F063 Valves

Radiation Work Permit (RWP) Packages

RWP 2002-1516 ISI and NDE Exams Inside the Annulus and Drywell
RWP 2002-1528 Diving in the Suppression Pool

RWP 2002-1534 E51F063 Valve Work and Actuator

Hot Spot Posting Verifications

HS-03, HS-07, HS-11, HS-26, HS-31, HS-33, HS-34, HS-44, and HS-60

ALARA Committee Meeting Minutes

Meeting 02-11 November 6, 2002
Meeting 02-12 December 18, 2002
Meeting 03-01 January 15, 2003
Meeting 03-02 February 24, 2003
Meeting 03-03 March 12, 2003
Meeting 03-04 April 9, 2003
Meeting 03-05 May 14, 2003
Meeting 03-06 June 11, 2003
Meeting 03-07 July 24, 2003
Meeting 03-08 August 15, 2003

ALARA Sub-Committee Meeting Minutes

Meeting 03-07 July 24, 2003
Meeting 03-07a July 30, 2003
Meeting 03-08 August 6, 2003
Meeting 03-08b August 12, 2003

Design Change Packages and Notices

ER-GG-2003-0116-000-0, “Relocate Supply Point for Reservoir Oil Level Sight Glass on Division III Generator Thrust Bearing Oil reservoir to eliminate Aeration Problem,” Revision 0

ER-GG-1999-0311-00, “Addition of Lube Oil Storage Skid to the Division III DG Room,” Revision 0

ER-GG-2001-0219-000, “Install Flexible Joints on Division I & II Standby Diesel Generators Jacket Water Return Lines from the Turbocharger,” Revision 0

ER-GG-2000-0015-000, Local Leak Rate Tests of These Penetrations are not Possible While On-Line. The Test Connections are Located in the Drywell,” Revision 0

ER-GG-2000-0074, “Modification of the Inboard MSIVs,” Revision 0

ER-GG-2001-0313, "Install DP Cell in Line with the SSW B Return Flow Instrumentation," Revision 0

ER-GG-2001-0158, “Standby Liquid Control System Discharge Pressure Rating Increase," Revision 0

ER-GG-2000-0891-001, “Plant Testing and Modifications Required to Implement Appendix K Power Uprate," Revision 0

Calculations

H91640, “Expansion Joint Design Calculations,” Revision 5

MC-Q1P75-01028, “Evaluation of the Modified SDG Division I & II Jacket Water Piping per ER 2001-000-00,” Revision 2

MC-Q1C41-01002, “Standby Liquid Control Single Accumulator Functional Failure," Revision 0.

Quality Assurance Audits and Surveillances

QA-14-203-GGNS-1, QS-2002-GGNS-011, QS-2002-GGNS-014, QS-2002-GGNS-015 and QS-2003-GGNS-003

Work Orders

5405	5541	5710	6421	2305
5425	5544	5711	1943	7867
5460	5709	2679	2144	

Condition Reports

CR-GGN-1999-1003	CR-GGN-2003-0450	CR-GGN-2003-2223
CR-GGN-2001-0104	CR-GGN-2003-0622	CR-GGN-2003-2238
CR-GGN-2001-0681	CR-GGN-2003-0660	CR-GGN-2003-2262
CR-GGN-2001-0833	CR-GGN-2003-0820	CR-GGN-2003-2374
CR-GGN-2001-1101	CR-GGN-2003-0853	CR-GGN-2003-2377
CR-GGN-2001-1730	CR-GGN-2003-1001	CR-GGN-2003-2399
CR-GGN-2002-0006	CR-GGN-2003-1198	CR-GGN-2003-2427
CR-GGN-2002-0035	CR-GGN-2003-1371	CR-GGN-2003-2554
CR-GGN-2002-0757	CR-GGN-2003-1723	CR-GGN-2003-2556
CR-GGN-2002-1065	CR-GGN-2003-1835	CR-GGN-2003-2583
CR-GGN-2002-1432	CR-GGN-2003-1847	CR-GGN-2003-2589
CR-GGN-2002-1779	CR-GGN-2003-1876	CR-GGN-2003-2621
CR-GGN-2002-1918	CR-GGN-2003-2005	CR-GGN-2003-2631
CR-GGN-2002-2310	CR-GGN-2003-2006	CR-GGN-2003-2660
CR-GGN-2002-2480	CR-GGN-2003-2029	CR-GGN-2003-2676
CR-GGN-2002-2458	CR-GGN-2003-2089	CR-GGN-2003-2679
CR-GGN-2002-2743	CR-GGN-2003-2104	CR-GGN-2003-2693
CR-GGN-2002-2745	CR-GGN-2003-2108	CR-GGN-2003-2702
CR-GGN-2002-2751	CR-GGN-2003-2122	CR-GGN-2003-2709
CR-GGN-2003-0338	CR-GGN-2003-2136	CR-GGN-2003-2711
CR-GGN-2003-0378	CR-GGN-2003-2141	CR-GGN-2003-2713

CR-GGN-2003-2723
CR-GGN-2003-2742
CR-GGN-2003-2760
CR-GGN-2003-2761
CR-GGN-2003-2762
CR-GGN-2003-2763
CR-GGN-2003-2764
CR-GGN-2003-2765
CR-GGN-2003-2766
CR-GGN-2003-2767
CR-GGN-2003-2768
CR-GGN-2003-2769
CR-GGN-2003-2771
CR-GGN-2003-2772
CR-GGN-2003-2787
CR-GGN-2003-2798

Maintenance Action Items
332510
332719

Other Miscellaneous Documents

Grand Gulf Fire Pre-plans, Revision 11

Amend149.TXT, Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 149 to Facility Operating License No. NFP-29

NRC Issue 7, “Failures Due to Flow-Induced Vibrations,” Revision 1

NRC Information Notice IN 2001-13, “Inadequate Standby Liquid Control System Relief Valve Margin,” August 10, 2001

2003 INPO Evaluation Report for Grand Gulf Nuclear Station, dated March 6, 2003