UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

January 25, 2002

William A. Eaton, Vice President
Operations - Grand Gulf Nuclear Station
Entergy Operations, Inc.
P.O. Box 756
Port Gibson, Mississippi 39150

SUBJECT: GRAND GULF NUCLEAR STATION - NRC INSPECTION REPORT 50-416/01-05

Dear Mr. Eaton:

On December 29, 2001, the NRC completed an inspection at your Grand Gulf Nuclear Station. The enclosed report documents the inspection findings which were discussed on January 9, 2002, with you and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the inspectors identified two issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that a violation is associated with one of these findings. The NRC is treating this violation as a noncited violation (NCV), in accordance with Section VI.A of the Enforcement Policy. If you deny this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Grand Gulf Nuclear Station facility.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your responses to these advisories and your ability to respond to terrorist attacks with the capabilities of the current design-basis threat. From these audits, the NRC has concluded that your security program is adequate at this time.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

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

Sincerely,

***/RA/***

David Graves, Chief
Project Branch A
Division of Reactor Projects

Docket: 50-416
License: NPF-29

Enclosure:
NRC Inspection Report
50-416/01-05

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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|---|---|
| Docket No: | 50-416 |
| License No: | NPF-29 |
| Report No: | 50-416/01-05 |
| Licensee: | Entergy Operations, Inc. |
| Facility: | Grand Gulf Nuclear Station |
| Location: | Waterloo Road<br>Port Gibson, Mississippi 39150 |
| Dates: | September 30 through December 29, 2001 |
| Inspectors : | T. L. Hoeg, Senior Resident Inspector<br>B. D. Baca, Health Physicist<br>R. W. Deese, Resident Inspector<br>J. S. Dodson, Health Physicist<br>P. J. Elkman, Emergency Preparedness Inspector<br>W. M. McNeill, Reactor Inspector<br>L. T. Ricketson, Senior Health Physicist |
| Approved By: | D. N. Graves, Chief, Project Branch A<br>Division of Reactor Projects |

ATTACHMENT: Supplemental Information

SUMMARY OF FINDINGS

IR 05000416-01-05, on 09/30-12/29/20001; Entergy Operations, Inc., Grand Gulf Nuclear Station. Integrated resident & regional inspection report; Gaseous and Liquid Effluents; Radiation Environmental Monitoring; Radiation Monitoring Instrumentation; 50.59 Inspection; Emergency Action Level and Emergency Plan Changes

The inspection was conducted by resident inspectors and regional reactor inspectors. The inspection identified one Green noncited violation and one Green Finding. The significance of any findings are indicated by their color (Green, White, Yellow, or Red) using IMC 609 "Significance Determination Process." Findings for which the Significant Determination Process does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html.

A. Inspector Identified Findings

**Cornerstone: Mitigating Systems**

- Green. The inspectors determined that the licensee did not recognize that the initiation of the end-of-cycle recirculation pump trip function of the reactor protection system exceeded their Maintenance Rule performance criteria. Therefore, they did not consider the need to establish goals and monitor the system under the Maintenance Rule. This finding is documented in the licensee's corrective action program as Condition Report (CR) 2001-1916.

  This finding had a credible impact on safety because the licensee was unable to trend and establish goals for the system and, therefore, would have limited their ability to determine the effectiveness of the maintenance performed. As a result, the licensee could have experienced future functional failures of the end-of-cycle recirculation pump trip, reducing its reliability. The inspectors determined that the safety significance of this finding was very low (Green). Although the licensee did not consider the need to establish goals and monitor the system, conditions under which the end-of-cycle recirculation pump trip would fail were very limited, all other reactivity control systems remained functional, and the end-of-cycle recirculation pump trip function was not required throughout the remainder of this operating cycle.

- Green. The inspectors determined that, following a design change modification performed under Engineering Request (ER) 2000-0770, the licensee failed to provide measures for verifying or checking that the end-of-cycle recirculation pump trip function of the reactor protection system was ensured in all cases of turbine control valve (TCV) fast closure. The modification to the end-of-cycle recirculation pump trip circuitry added margin to the oil pressure set point for the TCV operating oil pressure but made only limited analytical justification relative to short duration TCV fast closures during a short duration load reject. The engineering request did not address all of the inherent timing delays associated with the design of the circuitry installed in the plant. As a result, it remained possible for short duration TCV fast closures to occur without the initiation of an end-of-cycle recirculation pump trip. This was a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and is in the licensee's

corrective action program as Condition Report 2001-1371.

This violation is more than minor because if a short duration load reject occurred near the end of the operating cycle, the end-of-cycle recirculation pump trip function may not have actuated. The safety significance of this finding was very low (Green) because although the initiation of the end-of-cycle recirculation pump trip function failed, the reactor scrammed with all control rods inserted, the TCVs only partially closed, and the turbine bypass valves opened as designed. As a result, the reactor vessel pressure increase was small and had no significant effect on thermal limits.

Report Details

Summary of Plant Status: During this inspection period, the plant operated at or near 100 percent rated thermal power except for periodic planned small power reductions for rod pattern adjustments.

## 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness**

### 1R01 Adverse Weather (71111.01)

a. Inspection Scope

Prior to the onset of cold weather conditions, the inspectors reviewed Grand Gulf Nuclear Station's (GGNS) readiness to operate under freezing conditions. Equipment Performance Instruction 04-1-03-A30-1, Revision 13, "Cold Weather Protection," was reviewed and site walkdowns were performed to verify that the licensee had made prescribed preparations for cold weather. The inspection also included a detailed review of the ultimate heat sink cooling towers and other standby service water system components to ensure they were protected from freezing temperatures.

b. Findings

No findings of significance were identified.

### 1R02 Evaluation of Changes, Tests, and Experiments (71111.02)

a. Inspection Scope

The team reviewed a selected sample of 11 safety evaluations, listed in the attachment to this report, to verify that the licensee had appropriately considered the conditions under which the licensee may make changes to the facility or procedures or conduct tests or experiments without prior NRC approval.

The team reviewed a selected sample of 18 safety evaluation screenings, listed in the attachment to this report, in which the licensee determined that safety evaluations were not required, to ensure that the licensee's exclusion of a full evaluation was consistent with the requirements of 10 CFR 50.59, "Evaluations of Changes, Tests, or Experiments." The team also reviewed a selected sample of 9 safety evaluation exemptions, listed in the attachment to this report, in which the licensee determined that safety evaluation screenings were not required, to ensure that the licensee's exclusion of a full evaluation was consistent with the requirements of 10 CFR 50.59, "Evaluations of Changes, Tests, or Experiments."

The team reviewed three condition reports, the licensee's corrective action document, listed in the attachment to this report, initiated by the licensee that addressed problems or deficiencies associated with 10 CFR 50.59 requirements to ensure that appropriate corrective actions were being taken. The team also reviewed licensee self-assessments

to ensure that problems or deficiencies were appropriately addressed.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Equipment Alignment

a. Inspection Scope

The inspectors performed partial system walkdown inspections and reviews of systems important to reactor safety in order to verify the operability of the systems. The inspectors reviewed system operating instructions, system valve and breaker lineups, operator logs, system control room indications, and verified valves, breakers, and control circuits were in their required positions for operability. The following systems were inspected:

- Standby service water system, Train C
- Component cooling water
- Division III ac and dc electrical systems

b. Findings

No findings of significance were identified.

.2 Semi-Annual Equipment Alignment

a. Inspection Scope

The inspectors performed a complete walkdown of the reactor core isolation cooling system to determine if there were any discrepancies between the existing equipment lineup and the procedurally required lineup. During the walkdown, the inspectors used System Operating Instruction 04-1-01-E51-1, "Reactor Core Isolation Cooling," Revision 116; applicable annunciator response procedures; and Drawings M-1083A and M-1083B, "P&I Diagram - Reactor Core Isolation Cooling System," Revision 32 and 34 respectively, to verify major system components were correctly labeled, lubricated, cooled, and ventilated. The inspectors also reviewed recent condition reports on the system for any deficiencies that could affect the ability of the system to perform its function. Documentation associated with control room deficiencies, temporary modifications, operator work-arounds, 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 (71111.05)

.1 Fire Protection Area Walkdowns (71111.05Q)

a. Inspection Scope

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

- Diesel generator building corridor, Room 1D301
- Control building HVAC room, Room OC302
- Lower cable spreading room, Room OC402
- Auxiliary building corridor on the 93 foot level, Corridor 1A101
- Containment building, Area 1A512
- Reactor rotection System B Motor Generator Room, OC407

b. Findings

No findings of significance were identified.

.2 Fire Brigade Drill Observation (71111.05A)

a. Inspection Scope

On December 20, 2001, the inspectors observed the licensee's annual fire brigade drill including participation by the local Claiborne County Fire Department. The inspectors observed the wearing of fire brigade member's protective clothing, the simulated use of firefighting equipment, and the fire brigade leader's command and control of the firefighting efforts. The inspectors also verified the licensee's preplanned drill scenario was followed and that the drill objectives were met.

b. Findings

No findings of significance were identified

1R06 Flood Protection (71111.06)

.1 External

a. Inspection Scope

The inspectors reviewed flood protection measures for external sources as described in the Updated Safety Analysis Report, Technical Requirements Manual Specification 6.7.5, and Calculation C-A-254.5 "Evaluation of the Effect of predictive maximum precipitation (PMP) Flood Levels Above Elevation 133 Feet on Safe Plant Operation," Revision 1, and the associated Supplement 1, Revision 0, to that

calculation, to verify that the assumptions made in the external flooding analysis remained valid.

b. Findings

No findings of significance were identified.

.2 Internal Flood Protection

a. Inspection Scope

The inspectors conducted an inspection of flood protection measures within structures at GGNS. The inspection included a review of Off-Normal Event Procedure 05-1-02-VI-1, "Flooding," Revision 101, to determine areas in the plant susceptible to flooding from internal sources. Based on that review and a review of the probabilistic risk assessment, a walkdown of the high pressure core spray room was performed to assess the adequacy of flood protection measures.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Process (71111.11)

a. Inspection Scope

On November 7, 2001, during the conduct of a planned emergency preparedness drill, the inspectors observed operator requalification training activities in the simulator to assess the licensee's effectiveness in evaluating the requalification program and to ensure that licensed individuals received the appropriate level of training required to maintain their licenses.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12Q)

a. Inspection Scope

The inspectors reviewed performance-based problems involving 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; (5) the appropriateness of performance criteria for SSCs classified as (a)(2); and, (6) goals and corrective actions for SSCs classified as (a)(1). The inspectors reviewed the most recent system health reports and system functional failures for the last two years. The

following SSCs were reviewed:

- Division I standby service water system
- Component cooling water system
- Reactor protection system
- Emergency Diesel generator system - Division I
- High pressure core spray system
- Main steam isolation valve leakage control system

b. Findings

Reactor Protection System

On September 15, 2000, GGNS scrammed from 100 percent reactor power due to a ground fault on a 500-kV transmission line 30 miles north of the plant. As a result of the ground fault, a generator load reject was sensed by the turbine electro-hydraulic control system. The sensed load reject initiated a TCV fast closure which generated a reactor scram. However, the end-of-cycle recirculating pump trip (EOC-RPT) that should have occurred as a result of the TCV fast closure signal did not occur. This event was documented in Licensee Event Report (LER) 2000-005 and documented in previous NRC Inspection Report 50-416/2001-04, Section 1R14. The licensee determined that the short duration of the load reject signal may not have been present long enough to actuate the EOC-RPT logic. To correct this condition, the licensee raised the EOC-RPT secondary control fluid trip oil set point from 44.3 psig to 46 psig. On August 7, 2001, GGNS again scrammed due to a ground fault on the grid with the same results as previously experienced in September 2000. This scram and subsequent functional failure of EOC-RPT were documented in LER 2001-03.

The inspector found that the licensee's Maintenance Rule scoping document stated that the EOC-RPT is one of the reactor protection system functions for which the system is included in the scope of the Maintenance Rule. The performance criterion for this function was established as zero maintenance preventable functional failures per operating cycle. The inspector determined that the EOC-RPT functional failure experienced during the reactor scram in August 2001, was not evaluated by the licensee for being maintenance preventable and, therefore, establishing goals and monitoring the system under their Maintenance Rule Program was not considered. The licensee agreed that the August 2001 EOC-RPT functional failure should have been evaluated under the Maintenance Rule and initiated CR 2001-1916 to address the issue.

This finding had a credible impact on safety because the licensee was unable to trend and establish goals for the EOC-RPT function of the reactor protection system and, therefore, would have limited their ability to determine the effectiveness of the maintenance performed. As a result, the licensee could have experienced future functional failures of the EOC-RPT, reducing its reliability. The inspectors determined that the safety significance of this finding was very low (Green). Although the licensee did not consider the need to establish goals and monitor the system, conditions under which the EOC-RPT would fail were very limited, all other reactivity control systems

remained functional, and the EOC-RPT function was not required throughout the remainder of this operating cycle.

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

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 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 items reviewed during this period included:

- MAI 305663, Division II Emergency diesel generator starting air system corrective maintenance
- MAI 300604, Train B Standby service water system planned maintenance
- MAI 300723, Train A Standby gas treatment system planned maintenance
- MAI 306227, Reactor core isolation cooling system planned maintenance
- MAI 289129, Train B Standby service water system planned maintenance
- MAI 305062, Engineered safety feature (ESF) electrical switchgear room cooler planned maintenance

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Events (71111.14)

a. Inspection Scope

On November 27, 2001, while verifying Technical Specification 3.3.4.1, the licensee operations staff noted an approximate 20 percent drop in indicated flow through reactor recirculating system Jet Pump 13. Based on analysis of available plant data, the licensee ascertained they had blockage in this jet pump. The licensee determined that the jet pump was operable and subsequently justified operation for the rest of the cycle.

The inspectors observed the licensee's action in response to this abnormal condition.

The inspectors reviewed the symptomatic analysis, the plots and trends of pertinent plant parameters, the operability evaluation, onsite safety review meeting, and the licensee's other actions documented in CR 2001-1887.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed selected operability evaluations affecting risk-significant mitigating systems to assess: (1) technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were appropriately addressed with respect to their collective impact on continued safe plant operation; and, (4) where compensatory measures were involved, whether the measures were in place, would work as intended, and were appropriately controlled. The following evaluations were reviewed:

- CR-GGN-2001-1203, Division II hydrogen igniters
- CR-GGN-2001-1706, Scram discharge volume vent and drain valves
- CR-GGN-2001-1719, High Pressure Core Spray Valve 1E22FO23 motor
- CR-GGNS-2001-1871, Jet Pump 13 degraded flow

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors evaluated an operator workaround associated with the plant service water radial well flow control valves. Due to an inadequate design of these valves, system operations must be performed locally and could be unduly prolonged due to high river levels in the event of some malfunctions; this could necessitate an unplanned plant power decrease. The inspectors also specifically evaluated the effect of this operator workaround on the operators' abilities to implement applicable abnormal and emergency operating procedures.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed postmaintenance test procedures and associated testing activities for selected risk-significant mitigating systems to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria was clear and adequately demonstrated operational readiness, consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, ranges, and accuracy for the application; (5) tests were performed, as written, with applicable prerequisites satisfied; and, (6) that equipment was returned to the status required to perform its safety function. The following activities were reviewed:

- MAI 305663, Division II emergency diesel generator
- MAI 303940, Division I suppression pool temperature instrument
- MAI 306334, Reactor core isolation cooling system throttle valve
- MAI 302203, Valve 1E51FO68 position indicator
- MAI 308330, Turbine building cooling water isolation valve
- MAI 306023, Upper containment door inflatable seal

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed performance of surveillance test procedures and reviewed test data of selected risk-significant SSCs to assess whether the SSCs satisfied Technical Specifications, Updated Final Safety Analysis Report, Technical Requirements Manual, 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-EL-1E61-SA-0002, "Hydrogen Ignition System Semi-annual Test," Revision 105

- 06-OP-1P81-M-002, "Division III Emergency Diesel Generator Monthly Functional Test," Revision 110

- 06-OP-SP64-SA-0018, "Semi-Annual Fire Protection Water Main Lineup," Revision 103

- 06-OP-1E12-Q-0023, "LPCI/RHR "A" Quarterly Functional Test," Revision 107

- 06-OP-1E51-Q-0003, "RCIC Quarterly Functional Test," Revision 112
- 17-S-06-23, "ESF Room Cooler T46B004B Thermal Performance Test," Revision 8

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspector performed an in-office review of the following documents against 10 CFR 50.54(q) to determine if the revisions decreased the effectiveness of the emergency plan.

- Revision 44 to the GGNS Emergency Plan, submitted March 7, 2001
- Revision 45 to the GGNS Emergency Plan, submitted March 12, 2001
- Revision 46 to the GGNS Emergency Plan, submitted September 11, 2001

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

On November 7, 2001, 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 licensee personnel at various locations during the exercise including the control room simulator and the emergency operations facility. 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

**Cornerstones: Occupational Radiation Safety, Public Radiation Safety**

2OS3 Radiological Monitoring Instrumentation (71121.03)

a. Inspection Scope

To determine the accuracy and operability of radiation monitoring instruments used for the protection of occupational workers and the adequacy of the program to provide self-contained breathing apparatus to personnel, the inspector interviewed cognizant licensee personnel and compared the following items with regulatory requirements:

- Calibration, operability, and alarm setpoints, when applicable, of selected portable radiation detection instrumentation, continuous air monitors, electronic alarming dosimeters, whole-body counting instrumentation, small tool monitors, and personnel contamination monitors

- Calibration, operability, and alarm setpoints, when applicable, of selected installed radiation detection instrumentation such as Channel C high range and Channel A containment area monitors, control room ventilation radiation monitor, fuel handling mid and high range noble gas monitors, spent fuel pool criticality monitor, component cooling water monitor, and remote shutdown, reactor feed pump, and residual heat exchanger Room A area radiation monitors

- Calibration expiration and source response test currency of selected radiation detection instruments staged for use

- Corrective actions taken for instruments found significantly out of calibration and the consequences since the last successful source check or calibration

- The status of self-contained breathing apparatuses staged for use in the plant and associated surveillance records

- The licensee's capability for refilling and transporting self-contained breathing apparatus air bottles to and from staged plant locations during emergency conditions

- Training and qualifications of control room operators and emergency response personnel for use of self-contained breathing apparatus

- Radiological incidents that involved personnel contamination monitor alarms due to personnel internal exposures

- Quality assurance audits, "Maintenance M&TE and RP Calibration Facilities," (QA-10-2000-GGNS-1) and "Radiation Protection Program," (QA-14-2001-GGNS-1), and one focused self-assessment, "Instrument

Calibration," (RP-2001-05-GGNS)

- Procurement Audit (Audit Number 01-02-DL) of analytics' quality assurance program for the control of activities as they relate to the supply of radionuclide standards and sources
- Selection of calibration sources
- Procedures implementing the radiation instrumentation program and respiratory protection program
- Selected corrective action documents written between April 1, 2000, and December 21, 2001 (Condition Reports: CR-2000-0539, CR-2001-0269, CR-2001-0840, CR-2001-0851, CR-2001-0859, CR-2001-1208, CR-2001-1530, CR-2001-1546, CR-2001-1547, CR-2001-1612, CR-2001-1665, CR-2001-1698, CR-2001-1747, and CR-2001-1963)

In addition, the inspector observed and compared the following health physicist activities to regulatory requirements:

- Verification of an ion chamber's operability
- In-field source check of an ion chamber and telepole detector
- Calibration of a Bicron 50E survey meter

b. Findings

No findings of significance were identified.

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

a. Inspection Scope

To ensure that the gaseous and liquid effluent processing systems were maintained so that radiological releases were properly mitigated, monitored, and evaluated with respect to public exposure, the inspector interviewed cognizant personnel, walked down the major components of the gaseous and liquid release systems, observed equipment material condition, and compared the observed configuration to the description in the Final Safety Analysis Report. Additionally, the following items were reviewed and compared with regulatory requirements:

- 1999 and 2000 Radiological Effluent Release Report
- Changes to the Offsite Dose Calculation Manual and to the radioactive waste system design and operation
- Anomalous results, if any, reported in the Radiological Effluent Release Report
- Effluent radiological occurrence performance indicator incidents

- Sample collection and analysis of liquid and gaseous effluents
- Selected radioactive liquid waste release permits and associated projected doses to members of the public
- Compensatory sampling and radiological analyses conducted when effluent monitors were declared out of service
- Monthly, quarterly, and annual dose calculations
- Air cleaning system surveillance test results (Control Room/Z51-Train B and Standby Gas Treatment System/T48-Train A)
- Surveillance test results for the stack and vent flow rates
- Records of calibrations for effluent radiation monitors and flow measurement devices (noble gas monitors for the containment, turbine generator, and radwaste buildings and the liquid release monitor)
- Effluent radiation monitor alarm setpoint values
- Calibration records of counting room instrumentation associated with effluent monitoring and release activities
- Quality control records for the counting room instruments
- Audits (QA-6-2000-GGNS-1 and QA-6-2001-GGNS-1) related to the radioactive effluent treatment and monitoring program
- Corrective action reports related to the radioactive effluent treatment and monitoring program (CR-GGN-1999-1049, CR-GGN-2000-0118, CR-2000-1043, CR-GGN-2000-1370, and CR-2001-0280)

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program and Radioactive Material Control Program (71122.03)

a. Inspection Scope

The inspector interviewed members of the licensee's staff responsible for implementing the radiological environmental, meteorological monitoring, and radioactive material control programs. The inspector observed the following activities and equipment to verify that the above programs were implemented consistent with Technical Specifications and/or Offsite Dose Calculation Manual requirements:

- Collection and preparation for shipment of airborne particulate and charcoal samples for analysis at the offsite Entergy environmental laboratory

- Meteorological instruments at the primary and back up meteorological towers and data displays in the control room and technical support center

- Two environmental air sampling stations (AS-1 and AS-7), one broadleaf vegetation location (Sector J at the site boundary), and six thermoluminescent dosimetry stations (M-7, M-10, M-16, M-21, M-22, and M-60)

- The survey of materials for release from the radiologically controlled area

The following items were reviewed and compared with Technical Specifications and/or Offsite Dose Calculation Manual requirements to determine whether the licensee had an adequate program to verify the impact of radioactive effluent releases to the environment and to ensure that the licensee's surveys and controls were adequate to prevent the inadvertent release of licensed materials into the public domain:

- Implementing procedures for the radiological environmental monitoring program as described in the Offsite Dose Calculation Manual

- Number and location descriptions of the environmental sampling stations as specified in the Offsite Dose Calculation Manual

- Environmental sampling schedule, sample collection forms, and sample data forms

- Environmental sample analytical results

- Land use census (3/17/98, 4/3/00, and 11/19/01) results and any resulting changes to the radiological environmental monitoring program

- Calibration and maintenance records for air sampling equipment

- The performance of the Entergy environmental laboratory in the interlaboratory comparison program

- Calibration and maintenance records for the meteorological monitoring instrumentation

- Meteorological instrument operability, reliability, and annual meteorological data recovery

- 1998, 1999, and 2000 Annual Radiological Environmental Reports

- Audits (12.02-98, 12.01-99, QPA 37.01-99, QPA 37.01-2000, QA-6-2000-GGNS-1, QA-6-2001-GGNS-1, and QA-14-2001-GGNS-1), surveillance (QS-2000-GGNS-001), and self-assessment (dated 10/4/01)

- Corrective action documentation (GGNS Condition Reports 1999-0154, 0833, 0930, 1308, 1609, and 2026; 2000-0367, 0627, 1478, 1502, 1510, 1700, 1716, and 1740; and 2001-0103, 0219, 0439, 0458, 0473, 0597, 1289, and 1540)

- Procedures, methods, and instruments used to survey, control, and release materials from the controlled access area

- Calibration procedures and calibration checks for instruments used to perform radiological surveys prior to material release

- Detection sensitivities of radiation survey instruments used for contamination measurements prior to release of materials from the controlled access area, including screening levels for commonly found site-specific surface contamination radionuclides

- Criteria used for the unrestricted release of material from the radiologically controlled area

b. Findings

No findings of significance were identified.

## 4. OTHER ACTIVITIES [OA]

### 4OA1 Performance Indicator Verification (71151)

#### .1 Reactor Safety Cornerstone Performance Indicators

a. Inspection Scope

The inspectors verified the accuracy and completeness of the data used to calculate and report performance indicator data for the third and fourth quarters of 2000 and the first three quarters of 2001. The inspectors used Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 0, as guidance and interviewed licensee personnel responsible for compiling the information. The following performance indicators were reviewed:

- Safety system unavailability, Emergency ac power system
- Safety system unavailability, High pressure injection system
- Safety system unavailability, Residual heat removal system

b. Findings

No findings of significance were identified.

4OA3 Event Followup (71153)

(Closed) Licensee Event Report 50-416/01-003-00, "Automatic Reactor Scram Due to Offsite 500 KV Switchyard Problem and EOC-RPT Failure"

On August 7, 2001, the licensee experienced a reactor scram event due to an electrical grid disturbance that was sensed at the plant as a short duration load reject signal. The load reject signal initiated a TCV fast closure signal which initiated a reactor scram and should have actuated an EOC-RPT actuation. The EOC-RPT, which downshifts the reactor recirculation pumps from fast to slow speed, did not actuate. This feature is designed to insert negative reactivity in anticipation of lower control rod worth values that occur near the end of the plant operating cycle.

After a similar September 15, 2000, event in which the EOC-RPT failed to initiate, the licensee initiated engineering request ER-2000-0770 to modify the EOC-RPT pressure setpoint. In this previous event, the licensee concluded that the TCV fast closure signal was of such short duration that the conditions to initiate EOC-RPT were not sensed long enough to trigger all channels of the EOC-RPT logic. The ER directed raising of the TCV control oil pressure setpoint as a solution. This design change addressed the problem of ensuring that all sensors of control oil pressure that actuate EOC-RPT would actuate for an event in which TCV fast closure occurs. The ER, however, did not address the inherent timing delays associated with the design of the circuitry installed in the plant. The design-basis requirement specified by nuclear steam supply system vendor (General Electric) and the licensee's Technical Specification Bases is that EOC-RPT must initiate when the TCVs begin fast closure, regardless of what the initiating event is. This would include the short duration grid disturbances experienced. The design of the modification to the EOC-RPT circuitry added margin to the oil pressure set point but made only limited analytical justification relative to the newly identified, short duration TCV fast closure experienced during a short cycle load reject. As a result, it remained possible to initiate a TCV fast closure without the initiation of an EOC-RPT.

Appendix B of 10 CFR Part 50, Criterion III, "Design Control," states, in part, that design control measures shall provide for verifying or checking the adequacy of design through design reviews or other suitable methods. Contrary to the above, the adequacy of the measures taken by the licensee after the September 15, 2000 scram without EOC-RPT initiation, which included the design change specified by ER 2000-0770, did not provide for verifying or checking that EOC-RPT initiation was ensured in all cases of fast closure of the TCVs. This was identified as a violation of 10 CFR Part 50, Appendix B, Criterion III. This violation is being treated as a noncited violation consistent with Section VI.A of the NRC Enforcement Policy. This violation was entered into the licensee's corrective action program as CR-2001-1371 (NCV 05000416/2001-005-01).

The inspectors considered this issue to have a credible impact on safety. Following implementation of ER 2000-770, the reliability of the EOC-RPT function was affected such that a short duration load reject event near the end of the operating cycle may not have actuated the EOC-RPT function. The safety significance of this finding was very low (Green) because although the initiation of EOC-RPT function failed, the reactor

scrammed with all control rods inserted, the TCVs only partially closed, and the turbine bypass valves opened, as designed. As a result, the reactor vessel pressure increase was small, was within the safety analysis, and had no significant effect on thermal limits.

4OA6 Management Meetings

Exit Meeting Summary

On January 9, 2002, the resident inspectors presented their inspection results to Mr. W. Eaton, Vice President of Operations, and his staff, who acknowledged the findings.

The results of the radioactive gaseous and liquid effluent treatment and monitoring systems inspection were presented on November 30, 2001, to Mr. J. B. Edwards, Interim General Manager, and other members of licensee management, who acknowledged the findings.

The results of the radiological environmental monitoring program and radioactive material control program inspection were presented on December 7, 2001, to Mr. G. Sparks, Operations Manager, and other members of licensee management, who acknowledged the findings.

The results of the emergency action level and emergency plan changes inspection were presented telephonically on December 12, 2001, to Mr. C. Bottemiller, Manager, Licensing, and other members of licensee management, who acknowledged the findings.

The results of the evaluation of changes, tests, and experiments inspection were presented on December 13, 2001, to Mr. J. B. Edwards, Interim General Manager, and other members of licensee management, who acknowledged the findings.

The results of the radiological monitoring instrumentation inspection were presented on December 21, 2001, to Mr. W. Eaton, Vice President, Operations, and other members of licensee management, who acknowledged the findings.

The inspectors also asked if any materials examined during the inspections should be considered proprietary. No proprietary information was identified by the licensee.

## ATTACHMENT

## PARTIAL LIST OF PERSONS CONTACTED

Licensee

C. Abbott, Supervisor, Quality Audit
D. Barfield, Manager, Design Engineering
P. Barnes, Specialist, Licensing
R. Barnes, Manager, Training and Development
M. Bonds, Quality Assurance Auditor
C. Bottemiller, Manager, Plant Licensing
C. Brooks, Senior Licensing Specialist, Plant Licensing
C. Buford, Licensed Operator Requalification Instructor
A. Burks, Specialist, Radiation Protection
K. Christian, Supervisor, Code Program
G. Coker, Quality Assurance Specialist
D. Cotton, Supervisor, Radiation Protection
E. Cresap, Training
M. Cross, L-III Nondestructive Examiner
W. Deck, Security Superintendent
W. Eaton, Vice President, Operations
N. Edney, Supervisor, Radiation Protection
B. Edwards, Manager, Maintenance/Interim General Manager, Plant Operations
C. Ellsaesser, Manager, Corrective Action and Assessment
D. Fearn, Simulator Support Supervisor
A. Goel, Senior Engineer, Nuclear Safety Assurance
J. Graise, Senior Security Coordinator, Entergy
F. Guynn, Manager, Emergency Preparedness
C. Holifield, Senior Engineer, Nuclear Safety Assurance
R. Jackson, Senior Licensing Specialist, Nuclear Safety Assurance
C. Lambert, Director, Engineering
B. Lee, Supervisor, Inspection/Nondestructive Examination
T. McIntyre, Training Supervisor, Operations
R. Moomaw, Manager, Outage Planning and Scheduling
G. Pierce, Director, Program Oversight (Corporate)
M. Renfroe, Manager, Engineering Programs & Components
J. Roberts, Director, Nuclear Safety Assurance
G. Sparks, Manager, Operations
T. Thurmon, Senior Lead Engineer/Maintenance Rule Coordinator, Engineering
J. Venable, General Manager, Plant Operations
R. Wilson, Superintendent, Radiation Protection
E. Wright, Specialist, Radiation Protection
H. Yeldell, Manager, System Engineering

NRC

T. Hoeg, Senior Resident Inspector
R. Deese, Resident Inspector
C. Paulk, Senior Reactor Inspector

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

| | | |
|---|---|---|
| 05000416/2001-005-01 | NCV | Failure to verify adequacy of design of an EOC-RPT modification per 10 CFR 50, Appendix B, Criterion III (Section 4OA3) |

Closed

| | | |
|---|---|---|
| 05000416/2001-003-00 | LER | Automatic reactor scram due to offsite 500 KV switchyard problem and EOC-RPT failure (Section 4OA3.1) |

## LIST OF DOCUMENTS REVIEWED

Procedures and Procedure Changes Screened for Safety Evaluations:

| | | |
|---|---|---|
| 04-1-01-C11-1, Revision 116 | 04-1-01-L11-1, Revision 113 | 04-1-01-E51-1, Revision 116 |
| 04-1-01-C41-1, Revision 110 | 04-1-01-P42-1, Revision 39 | 05-1-02-V-2, Revision 102 |
| 04-1-01-E22-1, Revision 105 | 04-1-01-P75-1, Revision 58 | 05-1-02-VI-2, Revision 104 |
| 04-1-01-R23-1, Revision 25 | 05-1-02-I-2, Revision 21 | 15-S-01-106, Revision 3 |

Calculation Changes Screened for Safety Evaluation:

EC-Q1111-93001, Control Building Electrical Heat Load Calculation, Revision 5, Supplement 1

EC-Q1L62-91022, 120 VAC Class 1E Inverter Panel (1Y89) Circuit Coordination Study, Revision 3

EC-Q1L62-91023, 120 VAC Class 1E Inverter Panel (1Y84) Circuit Coordination Study, Revision 3

EC-Q1L62-91024, 120 VAC Class 1E Inverter Panel (1Y85) Circuit Coordination Study, Revision 3

EC-Q1L62-91025, 120 VAC Class 1E Inverter Panel (1Y86) Circuit Coordination Study, Revision 3

MC-QSP64-86058, Combustible Heat Load Calculation, Revision 51

Safety Evaluations:

| | | | |
|---|---|---|---|
| 2001-0047-R00 | 2001-0053-R01 | 2001-0057-R00 | 2001-0062-R00 |
| 2001-0053-R00 | 2001-0056-R00 | 2001-0058-R00 | 2001-0064-R00 |

2001-0065-R00 2001-0066-R00 2001-0067-R00

Exemptions:

LDC-2001-104 LDC-2001-115 LDC-2001-124 LDC-2001-131
LDC-2001-112 LDC-2001-123 LDC-2001-125 LDC-2001-132
LDC-2001-114

Maintenance Action Items (MAIs):

| | | |
|---|---|---|
| 303168 | 301810 | 308878 |
| 303158 | 303158 | 308528 |
| 303257 | 303168 | 304605 |
| 303940 | 267535 | 306045 |
| 298869 | 301373 | 302360 |
| 257823 | 304129 | 301723 |
| 257822 | 267535 | 297122 |
| 307056 | 301373 | 297491 |
| 307057 | 308871 | |

Condition Reports (CRs):

| | | | |
|---|---|---|---|
| 2001-1814 | 2001-1605 | 2000-1474 | 1999-0811 |
| 2001-1810 | 2001-1557 | 2000-1377 | 1999-0767 |
| 2001-1809 | 2001-1551 | 2000-1352 | 1999-0145 |
| 2001-1805 | 2001-1384 | 2000-0688 | 1999-0145 |
| 2001-1799 | 2001-1375 | 2000-0300 | 1998-1225 |
| 2001-1734 | 2001-1283 | 1999-1608 | 1998-0051 |
| 2001-1725 | 2001-1266 | 1999-1250 | 1997-0396 |
| 2001-1723 | 2001-0804 | 1999-1172 | 1997-0377 |
| 2001-1719 | 2001-0758 | 1999-1124 | 1997-0208 |
| 2001-1706 | 2001-0706 | 1999-0905 | |
| 2001-1697 | 2001-0649 | | |

Miscellaneous Documents:

Grand Gulf Nuclear Station Updated Final Safety Analysis Report, Amendment 97

LIST OF ACRONYMS

| | |
|---|---|
| CFR | Code of Federal Regulations |
| CR | condition report |
| ER | engineering request |
| EOC-RPT | end-of-cycle recirculating pump trip |
| ESF | engineered safety feature |
| GGNS | Grand Gulf Nuclear Station |
| LER | licensee event report |

| | |
|---|---|
| MAI | maintenance action items |
| NCV | noncited violation |
| NRC | U.S. Nuclear Regulatory Commission |
| PMP | predictive maximum precipitation |
| SSC | structures, systems, or components |
| TCV | turbine control valve |