



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

Report No.: 50-416/90-03

Licensee: System Energy Resources, Inc.  
Jackson, MS 39205

Docket No.: 50-416

License No.: NPF-29

Facility Name: Grand Gulf Nuclear Station

Inspection Conducted: February 17 through March 16, 1990

Inspectors:	<u><i>H. O. Christensen</i></u>	<u>4/2/90</u>
	H. O. Christensen, Senior Resident Inspector	Date Signed
	<u><i>J. L. Mathis</i></u>	<u>4/2/90</u>
	J. L. Mathis, Resident Inspector	Date Signed
Approved by:	<u><i>F. S. Cantrell</i></u>	<u>4/2/90</u>
	F. S. Cantrell, Section Chief Reactor Projects Branch 1 Division of Reactor Projects	Date Signed

SUMMARY

Scope:

The resident inspectors conducted a routine inspection in the following areas: operational safety verification; maintenance observation; surveillance observation; quality assurance program; action on previous inspection findings; and reportable occurrences. The inspectors conducted backshift inspections on February 19, 21 and March 15, 1990.

Results:

One violation was identified during this inspection period for failure to establish procedural controls which resulted in the contamination of the makeup water system and the unmonitored release of radioactive effluents (paragraph 3). In the areas of safety verification, maintenance observations and surveillance observations (paragraphs 3, 4 and 5), no major problems were identified. The licensee programs were effective with respect to meeting the safety objectives in these areas. During the exit meeting, the general manager committed to revising the temporary alteration procedure. The general manager will review and authorize extension to temporary alterations beyond the scheduled refueling outages. The licensee's quality assurance program appeared to be effective in identifying technical issues and problems having safety significance; however, minor deficiencies were noted with procedures (paragraph 6).

9004200147 900402  
PDR ADOCK 05000416  
R PIC

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. G. Cesare, Director, Nuclear Licensing
- W. T. Cottle, Vice President, Nuclear Operations
- D. G. Cupstid, Manager, Plant Modifications and Construction
- \*L. F. Daughtery, Compliance Supervisor
- J. P. Dimmette, Manager, Plant Maintenance
- \*S. M. Feith, Director, Quality Programs
- C. R. Hutchinson, GGN, General Manager
- F. K. Mangan, Director, Plant Projects and Support
- \*L. B. Moulder, Operations Superintendent
- \*J. V. Parrish, Manager, Training
- J. C. Roberts, Manager, Plant & System Engineering
- \*S. F. Tanner, Manager, Quality Services
- F. W. Titus, Director, Nuclear Plant Engineering
- M. J. Wright, Manager, Plant Support
- \*J. W. Yelverton, Manager, Plant Operations
- G. Zinke, Superintendent, Plant Licensing

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

\*Attended exit interview

### 2. Plant Status

The plant began and ended the inspection period in mode one, power operations.

### 3. Operational Verification Safety (71707 and 93702)

The inspectors were cognizant of the overall plant status, and of any significant safety matters related to plant operations. Daily discussions were held with plant management and various members of the plant operating staff. The inspectors made frequent visits to the control room. Observations included the verification of instrument readings, setpoints and recordings, status of operating systems, tags and clearances on equipment controls and switches, annunciator alarms, adherence to limiting conditions for operation, temporary alterations in effect, daily journals and data sheet entries, control room manning, and access controls. This inspection activity included numerous informal discussions with operators and their supervisors.

On a weekly basis selected engineered safety feature systems were confirmed operable. The confirmation was made by verifying that accessible valve flow path alignment was correct, power supply breaker and fuse status was correct and instrumentation was operational. The following systems were verified operable: LPCS, RCIC and LPCI A, B and C.

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

The inspectors observed health physics management involvement and awareness of significant plant activities, and observed plant radiation controls. Periodically the inspectors verified the adequacy of physical security control.

The inspectors reviewed safety related tagouts, 900215 (D/G deluge sprinkler system), 900286 (Leak off isolation valve for F505F to reduce leakage into drywell equipment and sump) and 900393 (SJAEB PCV F505B) to ensure that the tagouts were properly prepared, and performed. Additionally, the inspectors verified that the tagged components were in the required position.

The inspectors have noted that senior plant managers make routine tours to the plant and the control room.

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

On February 19, 1990, at 9:00 a.m., the unit received a half scram on Division 2 RPS. The half scram was caused by an APRM D upscale failure. Upon investigation the licensee determined the failure was caused by a faulty potentiometer on the D.C. amplifier card. The card was replaced and the APRM returned to service.

On February 22, 1990, the licensee informed the inspectors that methane gas was detected in the liquid radwaste RWCU and condensate phase separator tanks. NRC inspection report 90-02, paragraph 3, documents the discovery of flammable gas in a radwaste shipping cask. In investigating the radwaste cask issue, the licensee determined that the methane gas was produced by bacterial action. Bacteria from the plant service water system entered the radwaste drain system during cooler cleaning evolutions. The licensee vented the tanks to prevent gas buildup and is investigating ways to remove the bacteria. Additionally, the licensee issued a plant safety information bulletin to inform the plant staff of precautions while performing work in the tank rooms.

On March 1, 1990, during a post-effluent discharge flush of the liquid radwaste effluent radiation monitor, plant operations discovered that the monitors activity readings increased. Plant chemistry sampled the makeup water system (P21), demineralized water, and found it contaminated. Make up water was used to flush the liquid effluent discharge line downstream of the effluent radiation monitor. This flushing resulted in an unmonitored discharge for approximately 5 minutes. The activity level of the release was approximately 0.276 MPC or 545.9 micro curies. This was below TS limits and below the 2 MPC 10 CFR 50.72 reportable requirements.

The licensee determined that valves G41-F216 (P21 water) and G41-F217 (condensate storage water) to the cask wash down area were open. With both valves open, contaminated water was cross-tied to an uncontaminated system. An operator had opened G41F217 to provide additional water pressure to hydrostatically clean the cask washdown pit. After completing hydrostatic cleaning, both valves were left open.

The licensee flushed the P21 system and sampled all other water systems supplied by P21. Additionally, the licensee is reviewing options to prevent reoccurrence.

Technical Specification 6.8.1.a requires that written procedures shall be established, implemented, and maintained covering the activities recommended in appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Appendix A recommends procedures for the operation of the makeup system (filtration, purification, and water transfer) and the fuel pool cooling and cleanup system. Additionally, Administrative Procedure 01-S-06-2, Conduct of Operations, requires the Nuclear Operator B (NOB) to coordinate operations with other personnel and ensure the control room operator and shift superintendent are kept informed of equipment and system status. The opening of valves G41-F217 and G41-F216 were not controlled by procedure and the change in system status was not reported to the shift superintendent. The failure to establish procedural controls is a violation of TS 6.8.1.a (90-03-01), which resulted in the contamination of the makeup water system and an unmonitored release.

The inspector reviewed the temporary alteration program as described in procedure 01-S-06-3, Control of Temporary Alterations. The procedure requires a review be performed on open temporary alterations that are over 6 months old and a list sent to the operation superintendent. The procedure requires that temporary alterations over one year old be sent to the General Manager. Additionally the operations superintendent is required to ensure that these temporary alterations are scheduled to be

clear by the end of the next refueling outage. As of February 21, 1990, there were 5 temporary alterations open over 1 year old. Listed below are the open temporary alterations over 1 year old:

<u>TEMPORARY ALTERATIONS</u>	<u>ISSUE DATE</u>	<u>MCP/DCP/EER</u>
870006	3-30-87	86/0092
870016	8-8-86	87/0093
880001	1-3-88	89/6213
880002	1-8-88	88/0005
880004	2-8-88	87/0104

These temporary alterations were not closed/cleared during refueling outage 3 (March 18-April 30, 1989). The licensee committed to revise the procedure to include general manager review and authorization for temporary alterations that are greater than one year old and will not be closed during the next refueling outage. This commitment will be tracked as inspector followup item 90-03-02.

4. Maintenance Observation (62703)

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

<u>MWO</u>	<u>DESCRIPTION</u>
WO 4806	Calibrate MSA LIRA 202, freon detector.
WO 5852	Repair turbine casing temperature recorder.
WO 5976	Calibrate HPU filter pressure indicators.
WO 6322	Rebuild condensate booster pump A.
WO 6504	Replace disc pack on shaft for Div 1. EDG.

No violations or deviations were identified.

5. Surveillance Observation (61726)

The inspectors observed the performance of portions of the surveillances listed below. The observation included a review of the procedures for technical adequacy, conformance to technical specifications and LCOs; verification of test instrument calibration; observation of all or part of

the actual surveillances; removal and return to service of the system or component; and review of the data for acceptability based upon the acceptance criteria.

06-IC-1B21-M-1012	ATWS-Reactor Vessel Level/Reactor Pressure Functional Test, Channel D.
06-IC-1C11-Q-1-2	RPCS Low and High Power, Channel B Calibration.
06-IC-1C51-5A-0001	Average Power Range Monitor Calibration, Channel C.
06-OP-1P75-M-0002	Standby Diesel Generator 12, Functional Test.

No violations or deviations were identified.

6. Quality Assurance Program (35701)

The inspector reviewed the quality program organization to ensure that the licensee is implementing a QA program that is in conformance with regulatory requirements, commitments, and industry guides and standards. In addition, the inspector assessed the effectiveness of the licensee's ability to identify technical issues and problems having safety significance and their ability to ensure that issues and problems are resolved in a timely manner.

QAP 2.40 describes the requirements for indoctrination of QP personnel. QAP 2.44 describes the requirement for training and qualification of QP personnel and independent reviewers. The QP staff (reviewers and auditors/lead auditors) qualifications were reviewed against the above requirements. Copies of QP personnel training are not being maintained in the individual training files as required by of QAP 2.42. This discrepancy was also identified by the licensee in QDR 0005-90. The cause of this problem as documented in QDR 0005-90 is that these records were kept in the Nuclear Records Training Data Base. To correct this problem the licensee is planning to revise paragraph 5.7 of QAP 2.42 to reflect that training records will be maintained by a combination of QP training files and the Nuclear Records Training Database.

Annual training on changes/additions to the UFSAR (section 13), T.S. (section 6), upper tier policies and procedures and OQAM as required by section 5.7 of QAP 2.40 were not completed within the time frame for exempt personnel. Upon notification to the licensee of this discrepancy QDR 90/0059 was written. Followup to review the licensee corrective action to prevent this discrepancy from recurring will be tracked as IFI 90-03-03.

The inspector randomly selected QDRs, MNCRs and CARs to review the licensee's corrective and remedial actions taken to preclude recurrence of the referenced deficiencies or problems.

Material Non-Conformance Report (MNCRs) randomly selected were adequate in providing corrective action. However there exist problems with the MNCR process but of a different nature. See inspection report 50-416/90-02 paragraph 4 for more details.

Corrective Action Reports (CARs) reviewed by the inspector were effective in identifying problems. However, Form 16.10(c) for CAR 2214 was missing a "reviewed by" signature. Further investigation by the licensee of this problem revealed 4 additional examples of the same problem. QDR 90/0060 was written to document this problem and provide corrective actions. This item will be tracked as IFI 90-03-04.

The licensee is actively conducting performance based QA audits. The inspector reviewed the monthly summary report from March of 1989 to January of 1990. The report were thorough, in-depth and effective in identifying problems areas.

#### 7. Reportable Occurrences (90712, 92700)

The event reports listed below were reviewed to determine if the information provided met the NRC reporting requirements. The determination included adequacy of event description and corrective action taken or planned, existence of potential generic problems and the relative safety significance of each event. Additional inplant reviews and discussions with plant personnel as appropriate were conducted for the reports indicated by an asterisk. The event reports were reviewed using the guidance of the general policy and procedure for NRC enforcement actions, regarding licensee identified violations.

(Closed) LER 90-002, Failure to test redundant solenoid on isolation valve. While performing a SSFA, the licensee discovered that the Division 2 solenoid associated with secondary containment isolation valve G46F253, FPCC filter-demin system backwash isolation valve, was not being operated during the quarterly valve stroke time test. The failure to test the Division 2 solenoid was due to an inadequate surveillance procedure. The valve and Division 2 solenoid were successfully tested on January 26, 1990. The surveillance procedure was revised to test both Division 1 and 2 solenoids for valve G46F253. Additionally the licensee reviewed other dual solenoid isolation valves and the surveillance for these valves do stroke time test both solenoids. This item is closed.

On February 22, 1990, an during the performance of a field walkdown NPE engineer inadvertently bumped the D/G starting air receiver relief valve (P75PSVF025A). The valve opened, causing receiver pressure to decrease

below the technical specification limit of 160 psig. The valve was manually closed and TS air pressure limits were restored within 15 minutes. The licensee posted the area around the valve to restrict access. The D/G air receiver valves are scheduled to be remounted vertically during refueling outage 4 with valves of higher reset pressure. Additionally the licensee performed a seismic evaluation on the present valve condition and the valves would not lift during a seismic event.

No violations or deviations were identified.

8. Action on Previous Inspection Findings (92701, 92702)

(Closed) P2189-07 Defect in recirculation flow control logic in BWR 5 & 6 could allow both recirculation flow control valves to open to full run-out position and lead to reactor exceeding minimum critical power ratio and other fuel thermal limits. Upon receipt of this Part 21 Report, temporary alteration 88-0001 was already in place at Grand Gulf. This temporary alteration was established to require operation in loop manual mode of recirculation flow control. This assured adherence to technical specification limits in the event of a failure of high output limiter for the neutron flux controller of the recirculation flow control system. Engineering evaluation report (EER) 89-6216 has been written to convert the temporary alteration into a permanent installation.

(Closed) P2189-18 SMB actuators found to have melamine torque switches that under-go post mold shrinkage and causes cam binding. NPE concluded that cam lug failure problem would not prevent the valves from performing their safety function. NPE evaluation of the cam binding concern revealed that the majority of GGNS limiter torque actuator valves do not utilize the open torque switch and those utilizing the open torque switch have no safety function in the open direction. Therefore, the melamine torque switch cam binding problem is not a safety concern for the open direction. However, the evaluation revealed that in the closed direction the close limit switch is utilized to close the valve and the torque switch is utilized to seat the valve. NPE evaluation of all safety-related and ES-19 limiter torque actuators, based on criteria given in the Part 21 notification, determined that eight actuators were potentially affected. MNCR 0018-89 was initiated to document and correct the potential safety concerns. In addition nine melamine torque switches were located in the warehouse. DMR 0240-88 was initiated to destroy the switches to preclude future use. The eight torque switches mention above were replaced during the third refueling outage.

9. Exit Interview (30703)

The inspection scope and findings were summarized on March 16, 1990 with those persons indicated in paragraph 1 above. The licensee did not

identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. The general manager committed to revise the temporary alteration procedure.

<u>Item Number</u>	<u>Description and Reference</u>
Vio, 90-03-01	Inadequate procedure to prevent contamination of the makeup water system.
IFI, 90-03-02	Revise temporary alteration procedure to include general manager authorization.
IFI, 90-03-03	Review the corrective action to QDR 90/0059 for annual training of exempt personnel.
IFI, 90-03-04	Review the corrective action to QDR 90/0060 to delete the "reviewed by" signature block from form 16.10 (C).

#### 10. Acronyms and Initialisms

APRM	-	Average Power Range Monitor
ATWS	-	Anticipated Transient Without Scram
BWR	-	Boiling Water Reactor
CAR	-	Corrective Action Request
CRD	-	Control Rod Drive
DC	-	Direct Current
DCP	-	Design Change Package
DG	-	Diesel Generator
ECCS	-	Emergency Core Cooling System
EER	-	Engineering Evaluation Report
ESF	-	Engineering Safety Feature
HPCS	-	High Pressure Core Spray
HPU	-	Hydraulic Power Unit
I&C	-	Instrumentation and Control
IFI	-	Inspector Followup Item
LCO	-	Limiting Condition for Operation
LER	-	Licensee Event Report
LPCI	-	Low Pressure Core Injection
LPCS	-	Low Pressure Core Spray
MNCR	-	Material Nonconformance Report
MWO	-	Maintenance Work Order
NPE	-	Nuclear Plant Engineering
NRC	-	Nuclear Regulatory Commission
P&ID	-	Piping and Instrument Diagram
PSW	-	Plant Service Water
QAP	-	Quality Assurance Procedure
QDR	-	Quality Deficiency Report
RCIC	-	Reactor Core Isolation Cooling

RHR - Residual Heat Removal  
RPS - Reactor Protection System  
RWP - Radiation Work Permit  
SERI - System Energy Resource Incorporation  
SOI - System Operating Instruction  
SRV - Safety Relief Valve  
SSW - Standby Service Water  
TCN - Temporary Change Notice  
TS - Technical Specification  
UFSAR- Updated Final Safety Analysis Report