



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

Report Nos.: 50-416/88-12 and 50-417/88-01

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

Docket Nos.: 50-416 and 50-417

License Nos.: NPF-29 and CPPR-119

Facility Name: Grand Gulf Nuclear Station

Inspection Conducted: May 21 - June 24, 1988

Inspectors: <u>HC Dance/Sr</u> R. C. Butcher, Senior Resident Inspector	<u>7/5/88</u> Date Signed
<u>HC Dance/Sr</u> J. L. Mathis, Resident Inspector	<u>7/5/88</u> Date Signed
Approved by: <u>HC Dance</u> H. C. Dance, Section Chief Division of Reactor Projects	<u>7/5/88</u> Date Signed

SUMMARY

Scope: This routine inspection was conducted by the resident inspectors at the site in the areas of Licensee Action on Previous Enforcement Matters: Operational Safety Verification, Maintenance Observation, Surveillance Observation, ESF System Walkdown, Reportable Occurrences, Operating Reactor Events, Inspector Followup and Unresolved Items, and Review of Quality Assurance for Unit 2 Extended Construction Delay. All areas except for Unit 2 extended construction delay applies only to Unit 1.

Results: One unresolved item was identified involving inadvertent auxiliary lube oil pump starts on the Division 2 diesel generator, paragraph 8.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. G. Cesare, Director, Nuclear Licensing
- D. G. Cupstid, Start-up Supervisor
- \*L. F. Daughtery, Compliance Supervisor
- J. P. Dimmette, Manager, Plant Maintenance
- \*S. M. Feith, Director, Quality Programs
- \*C. R. Hutchinson, GGNS General Manager
- \*R. H. McAnulty, Electrical Superintendent
- A. S. McCurdy, Technical Assistant, Plant Operations Manager
- L. B. Moulder, Operations Superintendent
- J. H. Mueller, Mechanical Superintendent
- J. V. Parrish, Chemistry/Radiation Control Superintendent
- J. L. Robertson, Superintendent, Plant Licensing
- R. F. Rogers, Manager, Special Projects
- \*S. F. Tanner, Manager, Quality Services
- \*L. G. Temple, I&C Superintendent
- F. W. Titus, Director, Nuclear Plant Engineering
- \*M. J. Wright, Manager, Plant Support
- \*J. W. Yelverton, Manager, Plant Operations
- \*R. I. Dewitt, Unit 2 Construction

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

\*Attended exit interview

### 2. Licensee Action on Previous Enforcement Matters (92702)

(Closed) Violation 416/84-24-01. The licensee modified the Standby Service Water system by Design Change Package DCP 84/5006 to install a siphon line between the basins. The licensee's reaction to potential deficiencies has been very good and the NRC has been kept informed. No further action is required.

(Closed) Violation 416/84-24-02. The licensee's actions to resolve violation 416/84-24-01 resolved this issue also. No further action is required.

### 3. Operational Safety, Radiological Protection and Physical Security Verification (71707, 71709 and 71881)

The inspectors kept themselves informed on a daily basis of the overall plant status and 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 such that it was visited at least daily when an inspector was on site. Observations included 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.

Weekly, when the inspectors were onsite, selected Engineered Safety Feature (ESF) systems were confirmed operable. The confirmation is made by verifying the following: accessible valve flow path alignment, power supply breaker and fuse status, major component leakage, lubrication, cooling and general condition, and instrumentation.

General plant tours were conducted on at least a biweekly basis. Portions of the control building, turbine building, auxiliary building and outside areas were visited. Observations included safety related tagout verifications, shift turnover, sampling program, housekeeping and general plant conditions, fire protection equipment, control of activities in progress, problem identification systems, and containment isolation. The licensee's onsite emergency response facilities were toured to determine facility readiness.

The inspectors reviewed at least one Radiation Work Permit (RWP), observed health physics management involvement and awareness of significant plant activities, and observed plant radiation controls. The inspectors verified licensee compliance with physical security manning and access control requirements. Periodically the inspectors verified the adequacy of physical security detection and assessment aids.

The inspector reviewed the radiation monitoring instrumentation used to satisfy T.S. Table 3.3.7.1-1, Radiation Monitoring Instrumentation. Technical Specification Position Statement (TSPS) 069 provides a list of instrumentation used to satisfy items one thru nine of Table 3.3.7.1-1. It was found that instruments D17-RITS-K621A, K609A, K617A and K618A on control panel 1H13-P669 and instruments D17-RITS-K621C, K609C, K617C and K618C on control panel 1H13-P671 did not have the instrument number listed for identification. Only a descriptive name was provided. The addition of identifying numbers to the above instruments will be tracked as Inspector Followup Item 416/88-12-01.

Material Nonconformance Report (MNCR)-0094-88 was originated on April 11, 1988, to provide for the evaluation of the Low Pressure Core Spray (LPCS)/Residual Heat Removal A (RHR A) Differential Pressure (DP) line break instrumentation. As previously described in Inspection Report 416/87-40, the LPCS/RHR A DP line break annunciator alarmed at approximately 80 percent power during startup from the second refueling outage. After evaluation of MNCR 0015-88, which was originated at that time, the

LPCS/RHK A DP setpoint was revised to reflect the normal indicated DP at that time. The setpoints determined at that time were documented in surveillance procedure 06-IC-1E31-R-0021. The high DP alarm was set at 2.7 psid and the low DP alarm was set at 0.9 psid. Subsequently, the indicated LPCS/RHR A DP has slowly decreased until the low alarm tripped. The licensee has verified the calibration of the transmitters and trip units. The sensing lines were backfilled and vented and the licensee concluded that the instrumentation is working correctly. New data taken during power changes down to 75% power indicate that the LPCS line is not broken. Data now indicates that the downward trend in the LPCS/RHR A DP has stabilized and new setpoints were determined. By assuming a new normal range of 0.6 to 0.9 psid and using TS 4.5.1.c.2(b) tolerance of 1.2 psid, the new setpoints were determined as follows:

$$0.6 \text{ psid} + 1.2 \text{ psid} = 1.8 \text{ psid high alarm}$$

$$0.9 \text{ psid} - 1.2 \text{ psid} = 0.3 \text{ psid low alarm}$$

On June 3, 1988, the licensee revised the LPCS/RHR A DP instrumentation setpoints and cleared the line break annunciator. The licensee could not define the cause of the DP drift downward but concluded that further changes in DP will require evaluation to ensure that a line break has not occurred.

On May 27, 1988, a HP technician entered the cask washdown pit area on the 208 foot elevation of the auxiliary building. The technician was wearing double PCs and a respirator as required by RWP 88-05-001. When he entered the PCM-1 radiation monitor at the 93 foot level of the control building, he received an alarm on the face detector. A careful survey of his face showed no contamination and he subsequently re-entered the PCM-1 and passed. At 11:20 a.m., the same day, after exiting the chemistry laboratory, he entered the PCM-1 at the entrance to the water treatment building and received an alarm. A particle was lifted off the skin with a piece of adhesive tape by HP technician and then the particle was surveyed with a frisker and showed 3800 CPM on contact with the frisker probe, and 2800 CPM at approximately 1 CM from the probe. IE Information Notices (IENs) 86-23 and 87-39 provided information on events involving excessive skin exposures resulting from skin contamination by small, highly radioactive particles with high specific activity (Hot Particle). The licensee was cognizant of the IE Notices. The chemistry department performed a nuclide identification of the particle. The results showed that the only nuclide present was Ruthenium (RH)-106. Ruthenium has never been identified in isotopics performed on smear surveys at Grand Gulf.

The licensee has concluded that this particle originated at Waterford Nuclear Plant and survived the laundering process at Incerstate Nuclear Services (INS). Routine receipt inspection performed approximately one week later on incoming laundry from INS revealed through surveys hot particle existed on the laundry. The particles were removed by tape and

analyzed through isotopic analysis. The licensee contacted INS of the hot particle and plan to survey 100% of all incoming laundry in the future. NRC Region II was notified by the licensee of their findings.

No violations or deviations were identified.

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 Maintenance Work Orders (MWOs) and other related documents for adequacy, adherence to procedure, proper tagouts, adherence to technical specifications, radiological controls, observation of all or part of the actual work and/or retesting in progress, specified retest requirements, and adherence to the appropriate quality controls.

MWO ME4486	Clean PSW Side of CCW Heat Exchanger
MWO ME3154	Lube Oil Heater Pump Flexible Coupling Lubrication
MWO M82183	Retorque Air Start Valve Capscrews at Approximately 1969 Engine Run Hours
MWO IND600	Install/Remove Annubar in Accordance with Operation Instruction For Drywell Purge Compressor Cooler Flow
MWO M76046	Refurbish Spare MSIV Actuator per WI&IR
MWO I82716	Rework CRD Auxiliary Oil Pressure Switch
MWO M30649	SSW Cooling Tower Fan 52-16596 (Q1P41C003D)
MWO M82041	Disassemble. Rework Valve Internals for RCIC Steam Supply Isolation Valve
MWO L82874	Clean SSW Basin A Floor per WI&IR

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 procedure for technical adequacy, conformance to technical specifications, verification of test instrument calibration, observation of all or part of the actual surveillances, removal from service and return to service of the system or components affected, and review of the data for acceptability based upon the acceptance criteria.

06-IC-1E31-M-0023 Revision 28, RCIC/RHR and RCIC Steam Line High Flow Functional Test

06-IC-1C71-M-0001 Revision 25, Drywell High Pressure Functional Test (RPS/PCIS)

06-IC-1C71-M-1003 Revision 23, Turbine Control Valve Fast Closure (RPT/EOC RPT) Functional Test

06-IC-1E12-M-0001 Revision 23, LPIC System C Discharge Line High/Low Pressure Functional Test

06-OP-1P41-Q-0005 Revision 26, SSW Water Loop B Valve and Pump Operability Test

06-EL-1E30-M-0001 Revision 21, Suppression Pool Makeup Time Delay Relay Calibration and Functional Test

No violations or deviations were identified.

6. Engineered Safety Features System Walkdown (71710)

A complete walkdown was conducted on the accessible portions of the Control Room HVAC System. The walkdown consisted of an inspection and verification, where possible, of the required system valve alignment, including valve power available and valve locking where required, instrumentation valved in and functioning; electrical and instrumentation cabinets free from debris, loose materials, jumpers and evidence of rodents, and system free from other degrading conditions. The following minor discrepancies were noted.

- a. Valve Z51-F039A, A/C unit A level connection, was not labeled.
- b. A fire protection water line is not shown between charcoal and HEPA filter on P&ID drawing M-0049.
- c. Relief valve line drain isolation valves, Z51-F078 and Z51-F077, are not differentiated by designation of A or B for the appropriate system.
- d. The actual configuration of flow switch FSN-033 out in the field is different than depicted on drawing M-0049. The flow switch in the field has only one sensor connection versus two shown on the drawing.

Correction of the minor discrepancies identified above will be tracked as Inspector Followup Item 416/88-12-02.

No violations or deviations were identified.

## 7. Reportable Occurrences (90712 and 92700)

The below listed event reports 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.

The following License Event Reports (LERs) are closed:

<u>LER No.</u>	<u>Event Date</u>	<u>Event</u>
*88-004	January 12, 1988	RWCU System Isolation due to Procedural Deficiency
*88-009	February 27, 1988	Hydrogen Ignition in the Offgas System
*88-011	March 17, 1988	Inadvertent RHR Pump Start due to Personnel Error

The event of LER 88-009 was discussed in Inspection Reports 416/88-05 and 416/88-03.

The event of LER 88-011 was discussed in Inspection Report 416/88-03.

No violations or deviations were identified.

## 8. Operating Reactor Events (93702)

The inspectors reviewed activities associated with the below listed reactor events. The review included determination of cause, safety significance, performance of personnel and systems, and corrective action. The inspectors examined instrument recordings, computer printouts, operations journal entries, scram reports and had discussions with operations, maintenance and engineering support personnel as appropriate.

On May 26, 1988, during a Division 2 diesel generator surveillance run per surveillance procedure 06-OP-1P75-M-0002, the auxiliary lube oil pump inadvertently started when the diesel generator was started. The operator, following instructions per 06-OP-1P75-M-0002, then secured the auxiliary lube oil pump and made comment to that effect on the surveillance sheet. Similar events had previously occurred on March 2, 1988 and March 30, 1988, except at that time when the auxiliary lube oil pump was secured the diesel had tripped. These previous events were reported to the NRC in Special Reports 88-001 dated March 29, 1988, and 88-001/1 dated April 5,

1988. Based on the March events the cognizant maintenance engineer discussed with the diesel manufacturer, IMO-Delaval, the issue of the auxiliary lube oil pump automatically starting when the diesel generator is started. IMO-Delaval indicated verbally that due to the many variables which control the automatic starting of the auxiliary lube oil pump, its automatic start during a diesel generator start is not considered an abnormal event and is not detrimental to the diesel engine or its oil system. As noted in the referenced special reports the auxiliary lube oil pump functions as a backup to the engine driven lube oil pump and starts on low lube oil pressure if diesel speed is greater than 425 RPM. The auxiliary lube oil pump does not normally start during a diesel start. Based on discussion with the diesel manufacturer the licensee modified the monthly functional surveillance procedures, 06-OP-1P75-M-001/-002 and the diesel operating instruction, 04-1-01-P75-1 to define conditions required to be met prior to shutting down the auxiliary lube oil pump in case of a inadvertent start. The Updated Final Safety Analysis Report (UFSAR) paragraph 9.5.7.2.1, Standby Diesel Generator Lubrication System, states that each standby diesel engine is provided with two 100 percent capacity pumps. One pump is engine driven and a second pump is AC motor driven. During normal operation, the engine driven pump provides fuel oil flow. In the event of a failure in the engine driven pump, the redundant AC motor driven pump would provide full oil flow to the diesel engine. During engine operation both pumps provide a pressurized, filtered, and cooled oil supply to the engine lube oil headers. The changes to the licensee's procedures for operation of the diesel generators appear to meet the criteria of 10 CFR 50.59 which permit changes to the facility and procedures as described in the safety analysis report but which must include a written safety evaluation which provides the basis for the determination that the change, test or experiment does not involve an unreviewed safety question. The licensee did accomplish a 10 CFR 50.59 safety evaluation applicability review and answered no to the question of does the procedural revisions constitute a change to the facility or a change to procedures as described in the FSAR. No written safety evaluation was performed. Subsequently, on June 8, 1988, when starting the Division 2 diesel generator following maintenance, the auxiliary lube oil pump again started inadvertently. The operators checked the criteria for shutting down the auxiliary lube oil pump and verified the criteria was met. When the auxiliary lube oil pump was shut down the diesel tripped on low turbocharger oil pressure. The licensee determined that a loose fitting on the oil supply line to the low turbocharger lube oil pressure switch contributed to a false low turbocharger lube oil pressure signal which initiated the diesel generator trip. Following the tightening of the lube oil pressure switch fittings, the Division 2 DG was started twice and the auxiliary lube oil pump did not start either time. The criteria for preventing auxiliary lube oil pump start is that the main lube oil pump must produce 30 psig by the time the diesel reaches 425 rpm. The Division 1 and Division 2 diesel generators were then instrumented to determine lube oil pressure and diesel rpm during startup. During subsequent diesel generator starts the auxiliary lube oil pump inadvertently started again. A telecon was held on June 23, 1988, between the

licensee, the resident inspectors and NRC headquarters personnel to discuss the licensee's investigation findings and proposed actions regarding the diesel generator operational problems. The licensee has determined that the reason for the occasional low oil pressure and resultant start of the auxiliary lube oil pump was due to a deteriorated foot valve in the lube oil intake system. This finding was documented on Incident Report 88-6-7. The deteriorated foot valve permitted the lube oil line to drain down when not operational. Some of the licensee's proposed actions were:

- Review the material used as a soft seat in the foot valve.
- Develop an improved test for the foot valve to disclose deterioration.
- Evaluate disassembling the foot valve for more detailed inspection whenever maintenance is accomplished in the diesel sump.
- Review past diesel generator surveillance runs to catch any unusual comments.

The licensee will report the latest DG event by special report and was requested to include their proposed corrective actions as discussed in the telecon. The licensee is also reviewing this finding to determine if a 10 CFR 21 report is applicable. The inspectors are concerned with the adequacy of the licensee's initial investigation of the inadvertent start of the auxiliary lube oil pump on the Division 2 diesel generator. It appears that procedures were revised to permit securing the auxiliary lube oil pump without requiring adequate investigation to determine the root cause for the inadvertent starts. Also, the inspectors feel that a written safety evaluation per 10 CFR 50.59 should have been performed prior to revising procedures. Resolution of the inspectors concerns and followup of the licensee's corrective actions will be Unresolved Item\* 416/88-12-03.

Control rod 40-41 scrambled from the full out position (step 48) on June 22, 1988, at 1:37 a.m., a Division 1 fuse supplying power to the scram solenoid valve for rod 40-41 had blown. No indication exists to alert operators that power to solenoid valves has been interrupted. While performing a surveillance, power to the B trip system was deenergized resulting in actuations of both the A and B trip systems. This resulted in control rod 40-41 scrambling. Reactor power was reduced to 90 percent to verify fuel preconditioning limits had not been exceeded. Chemistry sampled the reactor coolant to verify no fuel damage. The licensee initiated Incident

\*Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations.

Report (IR) 88-6-8 to document this event. Plans to recover rod 40-41 is scheduled during the next rod sequence exchange. The licensee plans to monitor thermal limits to verify that they are not violated.

No violations or deviations were identified.

9. Inspector Followup and Unresolved Items (92701)

(Closed) Inspector Followup Item 416/86-39-02. Piping and Instrument Diagram M-1077C was revised to reflect the as built condition of using a 3/4 inch by 2 inch reducing tee from the booster compressor to check valves B21-F130A and B21-F130B. Also, Surveillance Procedure 06-0P-1B21-C-0003 was revised to delete valves B21-F082A,B,C,E,G,K,L,M and N. Valve B21-F082T was added. No further action is required.

(Closed) Inspector Followup Item 416/86-39-06. Procedure 04-1-01-P53-1, Instrument Air System, Revision 31 has valve 1P53-FA001 located in area 9 on elevation 139. This item is closed.

(Closed) Inspector Followup Item 416/86-21-01. The licensee has revised System Operating Instruction 04-1-01-C41-1 and Piping and Instrument Diagram M-1082 to show valve C41-F151 as locked close. Also, 04-1-01-C41-1 was revised to required valve C41-F006 to be locked open. This item is closed.

(Open) Inspector Followup Item 416/88-08-02. In Inspection Report 416/88-08, the licensee evaluation of a potential loose part in recirculation loop B was discussed. At that time the licensee had developed data to justify operation of the reactor for a period of up to 90 days beyond April 7, 1988. Subsequently, by a letter dated May 26, 1988, GE documented to the licensee their evaluation which justified continued plant operation up to the beginning of the third refueling outage under the following conditions.

- ° Monitoring of loop B noise levels will be performed at least every other day to detect any potential increase in noise levels during lengthy periods when the flow control valve is set at one position.
- ° Significant increases (approximately 50% or more) of impulsive forces or "g" levels with the FCV set at one position are identified and will be further evaluated.

The licensee's Engineering Department dispositioned Material Nonconformance Report (MNCR) on an interim basis requesting monitoring of noise levels as recommended by GE. Other actions, such as adding additional noise monitors to the B recirculation loop is being studied.

## 10. Review of Quality Assurance for Unit 2 Extended Construction Delay (92050)

The inspection was conducted to provide a periodic review of Quality Assurance (QA) activities for a construction site under an extended delay. The inspection was to determine whether the licensee had established adequate QA implementation plans, instructions and procedures which are in conformance with the establish QA plan.

A Preventive Maintenance (PM) program for Q-listed, balance of plant and ASME section III equipment is the responsibility of Bechtel Power Corporation. Construction Work Plan/Procedure WP/P-1 establishes the Bechtel Construction Department programs for compliance with and implementation of the QA responsibilities assigned to the construction department. Construction Work Plan/Procedures WP/P-14, Material Control, and WP/P-15, Maintenance of Materials and Equipment, are the controlling documents for the PM program during this delay period. Bechtel controls and tracks the frequency of maintenance and inspections of all equipment by the use of their Instorage Maintenance System Bulk Listing. The inspector reviewed the applicable procedures, walked through the Unit 2 power block and onsite warehouse to verify that equipment is properly maintained as described in WP/P-15.

The following components were verified to have received the proper PM:

HPCS Pump Motor E22C001  
 Inspected 06/22/88 Energized/Check Space Heater  
 Inspected 06/22/88 Visual

Standby Service Water Valve P41F122B  
 Inspected 06/22/88 For Visual

Control Rod Drive Valve C11F083  
 Inspected 06/22/88 For Visual

Component Cooling Water Valve P42F200A  
 Inspected 06/22/88 For Covering

Standby Service Water Valve P41F190  
 Inspected 06/22/88 Visual  
 Inspected 06/22/88 Humidity

RHR A Valve E12F047A  
 Inspected 06/22/88 Visual  
 Inspected 06/22/88 For Covering

Suppression Pool Makeup Valve E30F5C1A  
 Inspected 06/22/88 Visual

RCIC Pump E51C001  
     Inspected 06/14/88 Apply Rust Corrosion Preventive to all  
                           Machine Surfaces  
     Inspected 06/14/88 Visual

Fuel Handling Platform Assembly Bridge Drive Gear Case  
     Inspected 06/03/88 Visual

Fuel Pool Pump Motor G41C001A  
     Inspected 05/23/88 Visual

Fuel Pool Pump G41C001A  
     Inspected 05/20/88 Rotate Shaft  
     Inspected 05/19/88 Check Dessicant

RHR B Pump Motor E12C002B  
     Inspected 04/19/88 Check Oil  
     Inspected 04/01/88 Rotate Shaft  
     Inspected 04/01/88 Megger  
     Inspected 05/27/88 Visual

HPCS Metal Clad Switchgear HPCS Transformer 750 KVA  
     Inspected 06/01/88 Visual

EMD DSL Engine E22S001  
     Inspected 06/13/88 Visual Air Exhaust Silencer  
     Inspected 06/13/88 Visual Air Intake Silencer  
     Inspected 06/07/88 Vacuum Surface of D/G and all Equipment on  
                           Skid

The System Energy Resources, Inc. (SERI) QA organization is required to perform audits of Bechtel to assure compliance with their QA program and to assure that they are acceptably implemented. The inspector reviewed the following QA audits conducted by the SERI QA organization for compliance to the QA Manual and had no comments:

MAR-87/2-0003 Unit 2

QSA-88/2-0001 Unit 2

No violations or deviations were identified.

#### 11. Exit Interview (30703)

The inspection scope and findings were summarized on June 24, 1988, with those persons indicated in paragraph 1 above. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. The licensee had no comment on the following inspection findings:

- 416/88-12-01, Inspector Followup Item. Addition of identification labels to instruments on panels 1H13-P669 and 1H13-P671 (paragraph 3).
- 416/88-12-02, Resolve discrepancies noted during control room HVAC system walkdown (paragraph 6).
- 416/88-12-03, Unresolved Item. Corrective actions for inadvertent auxiliary lube oil pump starts on Division 2 diesel generator (paragraph 4).