UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report No.: 50-416/85-03

Licensee: Mississippi Power and Light Company
Jackson, MS 39205

Docket No.: 50-416 License No.: NPF-29

Facility Name: Grand Gulf 1

Inspection Conducted: January 16, 1985 - February 15, 1985

Inspectors: R. E. Carroll Jr. for 3/7/85
R. C. Butcher, Senior Resident Inspector Date Signed

R. E. Carroll Jr. for 3/7/85
J. L. Caldwell, Resident Inspector Date Signed

Approved by: Virgil Brownlee for 3/8/85
V. W. Panciera, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This inspection involved 175 inspector-hours on site in the areas of Operational Safety Verification, Maintenance Observation, Surveillance Test Observation, Engineered Safety Feature (ESF) System Walkdown, Reportable Occurrences, Operating Reactor Events and Independent Inspection.

Results: Of the seven areas inspected, no violations or deviations were identified in five areas; two apparent violations were found in two areas (failure to perform a safety analysis for storage of nitrogen bottles inside containment, Paragraph 5; inadequate procedure that permitted unreviewed and unapproved changes to procedures required by Technical Specification (TS) 6.8, Paragraph 10).

REPORT DETAILS

1. Persons Contacted

   Licensee Employees Contacted

   *J. E. Cross, General Manager
   *C. R. Hutchinson, Assistant Plant Manager, Maintenance
   *R. F. Rogers, Technical Assistant to the General Manager
   *W. P. Harris, Compliance
   *L. F. Daughtery, Compliance Superintendent
   *J. D. Bailey, Compliance Coordinator
   *J. H. Mueller, Mechanical Superintendent
   M. J. Wright, Acting Manager, Plant Operations
   *J. L. Robertson, Operations Superintendent
   D. G. Cupstid, Startup Supervisor
   F. W. Titus, Manager, Nuclear Plant Engineering
   J. G. Cesare, Manager, Nuclear Licensing

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

   *Attended Exit Interview

2. Exit Interview

   The inspection scope and findings were summarized on February 15, 1985, with those persons indicated in Paragraph 1 above. The licensee acknowledged the inspection findings and did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Inspection Findings

   This subject was not addressed in the inspection.

4. Unresolved Items

   Unresolved items were not identified during this inspection.

5. Operational Safety Verification (71707)

   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 procedures; 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 onsite, a selected ESF system is 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; radiation protection control; physical security; problem identification systems; and containment isolation.

The following comments were noted:

Several minor discrepancies were noted during the inspectors tours, such as the High Pressure Core Spray (HPCS) pump suction pressure gage E22R001 on elevation 93 of the auxiliary building was off scale and Maintenance Work Order (MWO) 43288 and MWO 43289 for valves C11F002A and C11F002B had been cancelled, but the MWO tags were still on the panel. The licensee was notified and identified discrepancies were promptly corrected. Housekeeing has been very good for a plant in the startup testing phase of operation. One discrepancy noted on February 12, 1985, involved the storage of several nitrogen pressure bottles used inside containment for recharging the nitrogen accumulators on the control rod drive system. The nitrogen bottles were free standing in corners, laying in the aisles, fixed in bottle transport carts and secured to the scram discharge instrument volume piping. The reactor was at low power during startup operations. The licensee was notified of the inspector's concern regarding the potential missile hazard inside containment and immediately took corrective action to remove excess nitrogen bottles and to provide restraint for those bottles remaining in containment. 10 CFR 50, Appendix A, Criterion 4 requires that structures, systems and components be appropriately protected against dynamic effects including the effects of missiles. 10 CFR 50.59 (a)(2) states that a proposed change, test, or experiment shall be deemed to involve an unreviewed safety question if a possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report may be created. Failure to perform a safety analysis for the storage of nitrogen bottles inside containment is a Violation of 10 CFR 50.59 (50-416/85-03-03).

6. Maintenance Observation (62703)

During the report period, the inspectors observed selected maintenance activities. The observations included a review of the work documents for adequacy, adherence to procedure, proper tagouts, adherence to TS, 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.

No violations or deviations were identified in the areas inspected.

7. Surveillance Test Observation (61726)

The inspector observed the performance of selected surveillances. The observation included a review of the procedure for technical adequacy, conformance to TS, 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.

No violations or deviations were identified in the areas inspected.

8. ESF System Walkdown (71710)

A complete walkdown was conducted on the accessible portions of the Low Pressure Core Spray 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 cabinets free from debris, loose materials, jumpers and evidence of rodents; and system free from other degrading conditions.

No violations or deviations were identified in the areas inspected.

9. Reportable Occurrences (90712 and 92700)

   a. The below listed Licensee Event Reports (LERs) were reviewed to determine if the information provided met 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 LERs were reviewed using the guidance of the general policy and procedure for NRC enforcement actions. The following LERs are closed.

LER No.	LER Date	Event
85-059	1-18-85	Reactor Water Clean Up (RWCU) isolation due to malfunctioning toggle switch.
84-048	11-19-84	Failure to estimate the flow rate of the fuel handling area ventilation exhaust flow rate.
84-047	11-16-84	Bypass of leakage detection system on the RWCU, Residual Heat Removal (RHR) and Reactor Core Isolation Cooling (RCIC) exceeds TS limit.
84-046	11-16-84	Inadvertent isolation of the RWCU system.
*84-053	12-21-84	ESF actuations due to reactor vessel level transient.
*84-052	12-20-84	Reactor scram on low reactor water level.
84-060	1-28-85	Exceeded main turbine overspeed protection system surveillance.
*84-058	12-24-84	Reactor scram due to Intermediate Range Monitor (IRM) high flux trip.

LER 84-053 was discussed in IE Report 85-02 and is tracked as violation 85-02-01. The LER is closed.

The reactor scram of LER-84-058 is discussed in Paragraph 10. This LER is closed.

b. 10 CFR Part 21 reports.

In a letter to the NRC, Office of Inspection and Enforcement, dated January 22, 1985, Transamerica Delaval Inc. (TDI), notified the NRC of a potential defect in a component of the TDI diesel generators. The air filter for the diesel generator engine control panel had a polycarbonate transparent bowl which was originally rated at 250 psig and was subsequently derated by the manufacturer to 150 psig at 125°F. The air pressure which the filter will see in operation cycles between 200 and 250 psig at room temperature. The Grand Gulf plant was listed as having the polycarbonate bowl on the air filter. The licensee was notified of this condition and immediately initiated action to procure and replace the polycarbonate bowl with a metal bowl which is rated at 250 psig at 175°F. The polycarbonate bowl has been replaced on the Division I and Division II diesel generators which are the only TDI diesels at Grand Gulf.

10. Operating Reactor Events (93702)

The inspectors reviewed activities associated with the below listed reactor scrams. 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.

a. Scram No. 13 December 21, 1984

Scram No. 13 occurred on December 21, 1984, at 4:17 a.m., from a loss of the feed and condensate pumps resulting in a low reactor vessel water level. The reactor was operating at approximately 17 percent core thermal power and the operators were starting a second condensate pump at the time of the scram. After the second condensate pump was started, both condensate pumps tripped on low flow resulting in the loss of the operating feed and booster pumps. The low flow was attributed to too few deep beds being in service and slow opening of the precoat filter bypass valve. The System Operating Instruction for placing an additional condensate pump in service has been modified to prevent recurrence of the trip. As a result of the scram, RCIC was started to restore reactor water level, but isolated due to a spurious high steam flow signal. Procedures and equipment have been modified to prevent recurrence of the RCIC isolation.

These modifications require monitoring the steam flow differential pressure (D/P) cell indication to ensure that it remains above zero and periodic filling of the reference leg to remove air caused by the water trap established in the reference leg. The plant is considering a more permanent modification to the D/P cell instrument tubing which would remove the water trap. This would allow the D/P cell to function as designed and not require additional operator action to ensure the continued operability of the RCIC System. The inspectors will continue to follow this item which will be identified as Inspector Followup Item (50-416/85-03-04).

b. Scram No. 14 December 24, 1984

Scram No. 14 occurred on December 24, 1984, at 12:32 p.m., from IRM Channels C and F exceeding their 120/125 trip setpoints. The reactor was at approximately 2 percent power during a normal shut down when the operator took manual control of the operating feed pump to increase the reactor vessel water level. The increase of relatively cool feedwater flow into the vessel caused the two IRM's to spike above their 120/125 trip setpoints resulting in a reactor scram. All safety systems responded as designed.

c. Scram No. 17 January 27, 1985

Scram No. 17 occurred on January 27, 1985, at 4:38 p.m., from a reduction of feed flow to the vessel, resulting in a low reactor water level scram. The plant was at approximately 69 percent power and performing reactor feed pump control tuning in preparation for performing a startup test procedure. Reactor feed pump B was in automatic control maintaining vessel level while feed pump A was in manual receiving 2 percent reduction step changes. On the third 2 percent reduction step change, B reactor feed pump discharge pressure increased above A feed pump discharge pressure, substantially reducing the A feed pump discharge flow. At this point, the A feed pump minimum flow valve opened diverting all of the A feed flow away from the vessel. The B feed pump was unable to make up for the loss of A feed pump flow before the reactor vessel level decreased below the low level scram setpoint causing the scram. All safety systems responded as designed. The plant does not need or intend to perform this type of tuning again.

d. Scram No. 18 January 29, 1985

On January 29, 1985, at 6:21 p.m., the reactor scrammed from 52 percent power while operations was attempting to place the B heater drain pump in the pump forward mode. System Operating Instruction (SOI) 04-1-01-N23-1 was being used to perform the evolution, but problems were experienced in opening valve N23F054. The operators concluded that valve N23F054 would not open due to 280 psid across its disk. A plan was formulated to reduce the differential pressure across N23F054, by cracking open valve N23F520A, opening N23F078 and cracking open N21F510. Then an another operator, stationed at the N23F054 breaker, was to open the breaker when the valve was just cracked off its seat. During the execution of the above plan, the operator at the N23F054 breaker called the control room to find out when he should open the breaker and concurrently the control room was trying to contact him to open the breaker. As a result, the N23F054 valve fully opened and condensate supply to the reactor feed pumps was diverted back to the condenser hotwell. Both operating reactor feed pumps tripped on low suction pressure and the reactor tripped on low water level. All Emergency Core Cooling Systems (ECCS) operated correctly. TS 6.8.1 requires written procedures for operating the feedwater system. SOI 04-1-01-N23-1 established the valve line up and procedure to place the heater drain pump in the pump forward mode. Administrative Procedure (AP) 01-S-06-2, Paragraph 6.2.8 states that the supervisor or control room operator shall provide written instructions for system evolutions aligning more than one valve unless the operator is performing the evolution per a checksheet or written procedure. The operators developed an alternate valve line up to that specified in SOI 04-1-01-N23-1 for placing the heater drain pump in the pump forward mode. TS 6.5.3.1.a. states that procedures required by TS 6.8 and changes thereto, shall be prepared, reviewed and approved.

AP 01-S-06-2 was inadequate in that it permitted the shift supervisor or control room operator to provide written instructions without the proper review and approval, which resulted in a reactor scram. This is a Violation (50-416/85-03-01). The licensee has revised AP 01-S-06-2 to correct this deficiency.

11. Independent Inspection (92706)

The inspectors reviewed Administrative Procedure 01-S-06-26, Revision 3, Post Trip Analysis. The following discrepancies were noted:

a. On Attachment III, page 1 - the IRM/APRM panel should be 1H13-P680-7B in lieu of 1H13-P680-7D.

b. On Attachment III, Table 3 - Drywell pressure high nominal trip setpoint should be ≤1.23 psig in lieu of ≥1.23 psig, differential flow should be ≤79 gpm and the main steam tunnel temperature-high should be ≤185°F in lieu of of ≥185°F.

The licensee has initiated a revision to 01-S-06-26 to correct identified discrepancies. This will be tracked as Inspector Followup Item (50-416/85-03-02).

On January 29, 1985, at 6:21 p.m., the reactor scrammed as a result of operations switching from Steam Jet Air Ejector (SJAE) B to SJAE A. After the scram and while the plant was cooling down, operations attempted to close the Main Steam Isolation Valves (MSIVs) to control the cooldown. MSIVs F022D, F928A and F028C did not remain closed. The operators close the MSIVs with the "test switch" so the MSIVs do not fast close (3 to 5 second closure time) to minimize loads on the valve. When the MSIV reaches its closed position, the "emergency MSIV control" is then switched to "close" and the MSIV should remain closed. The main pilot control valve puts instrument air to the "close" side of the MSIV air cylinder and exhausts air from the "open" side of the air cylinder when the control switch is placed in the "close" position. Due to a failure of the main pilot control valve, the MSIVs noted above recycled to the open position.

The licensee has not identified the failure mechanism of the main pilot control valve at this time and this scram will be addressed in the next inspection report. One discrepancy revealed during the inspectors' review of this event was the information supplied to the NRC on environmental qualification of electrical equipment. In a letter to Mr. H. Denton, dated January 25, 1985, the licensee discussed the justification for continued operation with the MSIV solenoid valve (main pilot control valve discussed above). The solenoid valves installed at Grand Gulf at the time of the reactor scram were ASCO model HTX8323-20V. The letter referenced an ASCO HTX8320A108V which is a different solenoid valve. The licensee was asked about this discrepancy and stated that the letter was in error, but they felt they could justify continued use of the existing solenoid valve also. Mr. L. Kintner, NRR, Licensing Project Manager, was notified of this discrepancy. The residents are continuing to follow up this event and the MSIV solenoid valve problem.