



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

Report Nos.: 50-424/91-05 and 50-425/91-05

Licensee: Georgia Power Company
P.O. Box 1295
Birmingham, AL 35201

Docket Nos.: 50-424 and 50-425

License Nos.: NPF-68 and NPF-81

Facility Name: Vogtle 1 and 2

Inspection Conducted: February 24 - March 23, 1991

Inspectors: S. E. Sparks /ja
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S. E. Sparks /ja
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4/8/91
Date Signed

4/8/91
Date Signed

Accompanied By: P. A. Balmain

Approved By: P. H. Skinner
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Reactor Projects Section 3B
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4/15/91
Date Signed

SUMMARY

Scope: This routine inspection entailed resident inspection in the following areas: plant operations, surveillance, ESF system walkdown, review of licensee event reports and followup.

Results: No violations or deviations were identified.

One example of a continuing weakness in operator awareness and attention to detail was noted in the unplanned start of the 1A EDG during a surveillance test (paragraph 2d).

One strength was noted in the conservative approach taken in the evaluation and interpretation of TS. On three occasions, all associated with the Unit 2, #4 SG leak, the licensee found it necessary to interpret TSs. The inspectors found each interpretation to be safe and conservative (paragraph 2f).

DETAILS

1. Persons Contacted

Licensee Employees

- *H. Beacher, Senior Plant Engineer
- J. Beasley, Manager Operations
- S. Bradley, Engineering Supervisor
- *S. Chesnut, Manager Technical Support
- *C. Christiansen, Safety Audit and Engineering Group Supervisor
- C. Coursey, Maintenance Superintendent
- *T. Greene, Assistant General Manager Plant Support
- *H. Handfinger, Manager Maintenance
- M. Hobbs, I&C Superintendent
- *K. Holmes, Manager Training and Emergency Preparedness
- *M. Horton, Manager Engineering Support
- *D. Huyck, Nuclear Security Manager
- *W. Kitchens, Assistant General Manager Plant Operations
- *R. LeGrand, Manager Health Physics and Chemistry
- *G. McCarley, Independent Safety Engineering Group Supervisor
- *M. Sheibani, Nuclear Safety and Compliance Supervisor - Acting
- *W. Shipman, General Manager Nuclear Plant
- *C. Stinespring, Manager Plant Administration
- *J. Swartzwelder, Manager Outage and Planning Operations

Other licensee employees contacted included technicians, supervisors, engineers, operators, maintenance personnel, quality control inspectors, and office personnel.

Olgethorpe Power Company Representative

- *E. Toupin

NRC Resident Inspectors

- *B. Bonser
- *D. Starkey
- *P. Balmain

*Attended Exit Interview

An alphabetical list of acronyms and initialisms is located in the last paragraph of the inspection report.

2. Plant Operations - (71707)

a. General

The inspection staff reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, Technical Specifications, and administrative controls. Control logs, shift supervisors' logs, shift relief records, LCO status logs, night orders and standing orders, lifted wires and jumper logs, and clearance logs were routinely reviewed. Discussions were conducted with plant operations, maintenance, chemistry, health physics, engineering support and technical support personnel. Daily plant status meetings were routinely attended.

Activities within the control room were monitored during shifts and shift changes. Actions observed were conducted as required by the licensee's procedures. The complement of licensed personnel on each shift met or exceeded the minimum required by TSs. Direct observations were conducted of control room panels, instrumentation and recorder traces important to safety. Operating parameters were observed to verify they were within TS limits. The inspectors also reviewed DCs to determine whether the licensee was appropriately documenting problems and implementing corrective actions.

Plant tours were taken during the reporting period on a routine basis. They included, but were not limited to, the turbine building, the auxiliary building, electrical equipment rooms, cable spreading rooms, NSCW towers, DG buildings, AFW buildings and the low voltage switchyard.

During plant tours, housekeeping, security, equipment status and radiation control practices were observed.

The inspectors verified that the licensee's health physics policies/procedures were followed. This included observation of HP practices and review of area surveys, radiation work permits, postings, and instrument calibration.

The inspectors verified that the security organization was properly manned and security personnel were capable of performing their assigned functions; persons and packages were checked prior to entry into the PA; vehicles were properly authorized, searched, and escorted within the PA; persons within the PA displayed photo identification badges; and personnel in vital areas were authorized.

b. Unit 1 Summary

The unit began the period operating at full power. On February 25, power was reduced to 90% for replacement of heater drain pump A due to high vibration. Power was reduced further on February 28 to approximately 80% due to potential electrical grid instabilities.

resulting from the West Macintosh 500 KV line being out of service. Power was returned to 90% on March 5, repairs to HDP A were completed and power was increased to 99%. On March 6, an ESF actuation occurred due to a voltage transient on the B train dc system that resulted in a control room ventilation and containment ventilation isolation. The ESF actuation had no effect on power operations. The unit operated at full power through the end of the report period.

c. Unit 2 Summary

The unit began the period in Mode 3 following an automatic reactor trip on Overtemperature Delta T due to a circuit card failure. On February 24, criticality was achieved; the unit entered Mode 1 and the main generator was tied to the grid. The unit reached 100% power on February 25 and operated at full power until March 16. On March 16, the unit was shutdown for a planned outage to install a main turbine EHC modification and to repair a leak on a SG #4 handhole. The unit achieved criticality and the generator was tied to the grid on March 24.

d. Unplanned Emergency Diesel Generator Start

On March 21, during performance of procedure 14608-1, SSPS Slave Relay K601 Train A Test Safety Injection, an unplanned start of the 1A EDG occurred. Personnel performing the surveillance had incorrectly depressed the "Test SI" push button instead of the "SI OR U/V Test Output Switch 1A & 1C" as called for in the procedure. The personnel involved had walked through the procedure prior to its performance and during the walk through had incorrectly identified which test push button was to be used. Three licensed personnel were present during the walkdown and none noticed that the panel pushbutton which they intended to use was not the one described in the procedure. This event was not considered to be reportable since the EDGs are not, by definition, ESF equipment. However, the licensee did write a DC, 1-91-079, which will require a formal disposition as to reportability and corrective actions. The licensee stated that the specific procedure step will be reworded and that a broadness review of similar procedures will be performed to eliminate possible future misinterpretations. The resident inspectors consider this event to be an example of operator inattention to detail in following a plant procedure.

e. Unit 2 SG Secondary Side Access Handhole Leak Repair

During recent Unit 2 operation, a leak developed around the seating surface of a secondary side handhole on SG #4. The leak became apparent when the Containment Air Cooler Condensate Leak Detection system was alarming continuously. An analysis of the leak off determined the leak was not from the RCS. Walkdowns in containment determined that the leak was from a secondary side handhole close to

the tube sheet on the #4 steam generator. Calculations on the magnitude of the leak ranged up to 4 gpm.

The licensee developed a repair scheme which called for shutting down the unit to Mode 3 (Hot Standby) and pressure injection of a sealant compound into the handhole cover plate. This repair scheme was intended to seal the void between the handhole cover and the SG shell. Injection of the sealant compound involved drilling holes into the handhole cover plate. The licensee's safety evaluation of the leak repair technique involved the assessment of two issues: an evaluation of the structural aspects of the SG shell to determine that SG integrity was maintained; and the resultant effect on secondary side chemistry following introduction of the sealant compound. The inspectors reviewed the licensee's temporary modification request and 10 CFR 50.59 safety evaluation and were satisfied the licensee was taking a safe and conservative approach.

Over the weekend of March 16, Unit 2 was shutdown to Mode 3 to perform the leak repair. The first attempt to stop the leak failed. Following this attempt, the licensee discovered that the sealant used in the effort was inadequate for the temperature and pressure involved. Apparently, at normal operating temperature and pressure, the sealant turned to powder. The licensee in preparing the Temporary Modification Request failed to adequately consider the effects of temperature. A second attempt at injecting sealant, using a metal clamp around the outside diameter of the flange and a different sealant, also failed to stop the leak. On March 20, Unit 2 was taken to Mode 5 (Cold Shutdown). The #4 steam generator was drained and the leaking flange was removed for inspection and repair. At the end of the inspection period the repairs had been completed and the unit was returning to power.

f. Technical Specification Clarifications

During this inspection report period, the inspectors noted three occasions where the licensee found it necessary to clarify or evaluate TS for continued conduct of operations. These three evaluations were all associated with the leak on the Unit 2 #4 steam generator. In all three cases, the inspectors assessed the licensee's clarifications as safe and conservative. The inspectors paid particular attention to these interpretations because they all involved weighing safety and economic factors. The conservatism of the licensee's interpretations have been questioned in the past.

The first clarification involved the Containment Air Cooler Condensate Leak Detection system being in constant alarm (TS 3.4.6.1). The question was whether the constant alarm rendered this portion of the RCS leak detection system inoperable. The licensee's conclusion was that the alarm function is not required for the system

to perform its function. The system was operable as long as it was capable of being used for leakage detection. The licensee initiated a surveillance to calculate leak rate from air cooler condensate once per shift.

The second decision involved a judgement on whether to go to Mode 4 (Hot Shutdown) or Mode 5 (Cold Shutdown) for removal and/or repair of the SG handhole. In Mode 4, the Containment Integrity TS was still applicable. With the potential removal of the handhole cover, the question arose whether Containment Integrity would be violated if the plant was still in Mode 4. After considering this and other factors, the licensee decided to go to Mode 5.

The third clarification, applicable in Mode 5 only, involved a footnote in TS 3.4.1.4.1 which requires a RCP not be started unless secondary water temperature of each SG is less than 50 degrees F above each RCS cold leg temperature. The licensee wanted to start a RCP with no RCPs running (in Mode 5) after securing the only running RCP upon receiving a high vibration alarm (which later proved false). The basis for this TS is to prevent RCS pressure transients through energy addition from the secondary side. With SG #4 drained for the handhole repair a question arose as to applicability of the TS to the empty SG. The licensee performed a thermodynamic analysis of air and water and concluded it was acceptable to start a RCP with a SG drained.

g. ESF Actuations - Containment Ventilation Isolation And Control Room Isolation

On March 6, personnel were troubleshooting an electrical ground in the Unit 1 125 vdc switchgear. As a part of this process, the 1B battery output breaker, 1BD1-01, was opened creating a disconnect between the battery chargers and the batteries. When the battery chargers began making variable pitched noises and the indicator light on the bus began to fluctuate in intensity the equipment operator reclosed the breaker. In the control room a large number of annunciators were received including indications that a containment ventilation isolation and control room isolation had occurred. All valves and dampers actuated as designed.

The licensee's investigation determined that when circuit breaker 1BD1-01 was opened one of the two battery chargers (1BD1CA) experienced voltage fluctuations from 90 to 140 volts. A protection circuit in inverter 1BD1I12 automatically shutdown inverter operation when voltage from the chargers went below 105 volts. When the inverter tripped, power was lost to various radiation monitors and other equipment that had annunciated in the control room. This caused the radiation monitors to send ESF actuation signals upon loss

of power. It was found that the voltage fluctuations in battery charger 1B01CA could be stopped when any one of its six control circuit boards was replaced. The licensee could not explain this unusual condition. A search for a specific failure is continuing. The licensee will report this event in LER 424/91-04.

No violations or deviations were identified.

3. ESF System Walkdown (71710)

On March 19, the inspectors completed a system walkdown of both trains of the Unit 1 Containment Spray System. The purpose of the walkdown was to determine whether the system lineup procedure, Containment Spray System Alignment, 11115-1, Rev. 5, agreed with the plant piping and instrumentation diagram, 1X4DB131, Rev. 22 and to identify equipment conditions and items that might degrade plant performance.

Material condition of those areas inspected was good and nothing was observed which might affect system operability. However, several discrepancies were noted regarding labeling of components. Specifically, two valves were missing plastic identification tags, the wording on seven valve identification tags did not exactly match the valve description in the system alignment procedure, and all twelve electrical breaker ID tags differed from the alignment procedure written description. These labeling discrepancies were discussed with the licensee and corrective action will be taken. The inspectors had no other concerns regarding this Containment Spray System walkdown.

No violations or deviations were identified.

4. Surveillance Observation (61726)

Surveillance tests were reviewed by the inspectors to verify procedural and performance adequacy. The completed tests reviewed were examined for necessary test prerequisites, instructions, acceptance criteria, technical content, data collection, independent verification where required, handling of deficiencies noted, and review of completed work. The tests witnessed, in whole or in part, were inspected to determine that approved procedures were available, equipment was calibrated, prerequisites were met, tests were conducted according to procedure, test results were acceptable and systems restoration was completed.

Listed below are surveillances which were either reviewed or witnessed:

<u>Surveillance No.</u>	<u>Title</u>
11121-C	Containment Coolers Condensate Collection Calculation
14546-1	Turbine Driven Auxiliary Feedwater Pump Operability Test
14553-2	ESF Room Cooler And Safety Related Chiller Flow Path Verification
14980-1	Diesel Generator Operability Test (6 month fast load test)
14980-2	Diesel Generator Operability Test
28911-2	Seven Day Battery Inspection And Maintenance

a. Main Feedwater Regulating Valves And Bypass Valves Testing

During the licensee's review of Generic Letter 89-19, "Safety Implication of Control Systems in LWR Nuclear Power Plants", it was identified that the MFRVs and BFRVs, according to Westinghouse, are credited in the safety analysis as a backup to the Feedwater Isolation Valves. Termination of main feedwater flow to a faulted steam generator is assumed in the steam line break and feed line break analyses in order to limit the RCS cooldown and mass release from the break. As a result, the licensee added the MFRVs and BFRVs to the active valve list in the FSAR and included them in the Inservice Testing Program. When the Unit 1 active list, IST program, and TS were originally developed the MFRVs and BFRVs were deliberately excluded because it was thought that they were not required by the safety analyses.

To date, the Unit 1 BFRVs and the Unit 2 MFRVs and BFRVs have been tested with satisfactory results. The only remaining valves are the Unit 1 MFRVs which will not be tested within the time requirements now established in the testing program (MFRVs can only be tested with the plant shutdown).

Due to the inability to stroke test the MFRVs at power, the resident inspectors requested that the licensee justify the capability of the MFRVs to close within the specified time until the plant is in a mode in which the valves can be tested. The licensee, using completed ESF Response Time Summation procedures and I&C loop calibration

procedures, obtained data which included times for the sensors, SSPS processing and closure times for the MFRVs. The response times for each of the MFRVs was calculated to verify that they could meet the feedwater isolation response time requirements and the inservice testing requirements. All the calculations were within the specified time requirements.

Once the need for testing of these valves was identified, the licensee took appropriate action to add them to the IST program, test the valves if possible, and address the safety issue on the Unit 1 MFRVs.

No violations or deviations were identified.

5. Maintenance Observation (62703)

During this inspection period, a maintenance team inspection (MIT) was conducted at Vogtle by inspectors from Region II and NRR. The results of that comprehensive inspection will be documented in report 50-424,425/91-03.

No violations or deviations were identified.

6. Review of Licensee Reports (90712)(92700)

The below listed Licensee Event Reports were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of description, verification of compliance with TS and regulatory requirements, corrective action taken, existence of potential generic problems, reporting requirements satisfied, and the relative safety significance of each event.

a. (Closed) 50-425/90-03, Rev. 0, "Trip Of Heater Drain Pump Results In Exceeding The Reactor Power License Limit."

Reactor power was reduced to 90% of rated thermal power and was maintained at that power until previously scheduled maintenance on the heater drain pump was completed. The manual actuation pin for the HDT high level dump valve was disengaged and the valve was returned to automatic operation. The pins were modified so that they are now restrained in the automatic position. Licensed operators were trained during a subsequent requalification class on the conditions that led up to and caused the over power event.

- b. (Closed) 50-424/90-20, Rev. 0, "Personnel Error Leads To A Technical Specification Violation."

The GPC electrician and foreman involved were counseled regarding the importance of attention to detail. The Maintenance Manager sent a memo to other appropriate personnel describing this event and the need for adequate reviews. Battery cell #35 was designated a pilot cell, which required weekly testing and should allow future problems with cell #35 to be identified sooner. Finally, battery procedures were reviewed and revised to simplify data recording and to eliminate duplication.

- c. (Closed) 50-425/90-12, Rev. 0, "Personnel Errors Lead To Containment Spray Pumps' Deactivation."

The SS who approved the clearance to remove the containment spray pump from service was counseled regarding the importance of accuracy in reviewing clearances related to equipment required to be operable per TS. The Reactor Operator was counseled regarding the importance of maintaining a questioning attitude in the performance of his duties. A copy of this LER was included in the Operations Reading Book and was reviewed during a subsequent operator requalification cycle.

- d. (Open) 50-425/91-03, Rev. 0, "Diesel Generator Failures May Have Resulted In Loss Of Ability To Mitigate Accident Consequences."

The K4 transfer relays for both the 2A and 2B DGs were replaced and both DGs were demonstrated to be operable. The transfer relay contacts on DG 1A were tested and no problems were found. The K4 transfer relay was replaced on DG 1B due to a somewhat higher resistance across contacts 1 and 7. Furthermore, each DG has been instrumented to measure voltage drop during paralleling operation. No abnormal readings were observed. Testing will continue on the 2A DG in an effort to identify the root cause of the failure. If the licensee determines a defective cause of the failure, a supplemental LER will be submitted. This LER will remain open pending further developments in the licensee's investigation.

No violations or deviations were identified.

7. Followup (92701,92702)

- a. (Closed) Part 21 Report, 50-424, 425/91-02, "Cooper Energy Services Potential Defect With EDG Starting Air Admission Valve."

Energy Services Group of Cooper Industries, in a letter to GPC dated July 31, 1990, recommended a plan of action to address the valve sticking problem. GPC subsequently completed all recommended work for valves in service on all Unit 1 and Unit 2 EDGs. Additionally, appropriate maintenance procedures were revised to require that all

air start valves in the warehouse be modified prior to installation on a EDG.

- b. (Closed) VIO 424,425/90-20-01, "Inadequate Diesel Generator Procedure Resulting In Violation Of TS 6.7.1a."

The licensee responded to the violation in correspondence dated November 15, 1990. Corrective actions included briefing on-shift operations personnel regarding the correct methods for shutting down a diesel generator after an emergency start; additional training incorporated into licensed operator requalification; and revision of plant procedures 13145-1 and 2, "Diesel Generators", to provide guidance on actions to take concerning shutting down the diesels after emergency starts. Based on a review of the licensee's completed corrective actions this violation is closed.

8. Exit Meeting

The inspection scope and findings were summarized on March 22, 1991, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection.

9. Acronyms And Initialisms

BFRV	Bypass Feed Regulating Valve
DC	Deficiency Cards
dc	Direct Current
EDG	Emergency Diesel Generator
EHC	Electro-Hydraulic Control
ESF	Engineered Safety Features
FSAR	Final Safety Analysis Report
HDP	Heater Drain Pump
HP	Health Physics
IST	Inservice Test
KV	Kilo-Volts
LER	Licensee Event Reports
MFRV	Main Feed Regulating Valve
RCS	Reactor Coolant System
RCP	Reactor Coolant Pump
SG	Steam Generator
SI	Safety Injection
TS	Technical Specification
UV	Undervoltage