

U. S. NUCLEAR REGULATORY COMMISSION (NRC)

REGION II

Docket Nos. 50-424 and 50-425  
License Nos. NPF-68 and NPF-81

Report No: 50-424/98-07, 50-425/98-07

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Vogtle Electric Generating Plant (VEGP) Units 1 and 2

Location: 7821 River Road  
Waynesboro, GA 30830

Dates: August 16, 1998 through September 26, 1998

Inspectors: J. Zeiler, Senior Resident Inspector  
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B. Holbrook, Senior Project Engineer (Section O2.1)  
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Enclosure 2

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## EXECUTIVE SUMMARY

### Vogtle Electric Generating Plant Units 1 and 2 NRC Inspection Report 50-424/98-07, 50-425/98-07

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection. It also includes the results of an announced inspection by a regional maintenance inspector, Senior Project Engineer, and Senior Resident Inspector, Hatch.

#### Operations

- Operator actions to initiate a Unit 2 manual reactor trip on August 24 prior to automatic protection actuation were proactive. The rapid identification and response to decreasing steam generator level was indicative of good operator performance. Licensee actions appropriately addressed the cause of the trip (Section O1.2).
- The licensee's root cause investigation and subsequent corrective actions for a Unit 2 manual reactor trip on September 4 were thorough and addressed the cause of the trip. Operations personnel were prepared for the possible loss of feedwater and responded in a timely and appropriate manner. The preparation, rapid identification, and response to the event was an indication of good performance by the operating crew (Section O1.3).
- The observed Plant Review Board (PRB) committee did not fully discuss the subjects presented and several members had not reviewed the material prior to meeting. These types of observations had not been typical in past PRB meeting observations (Section O7.1).

#### Maintenance

- A violation was identified for the failure to include adequate instructions in a design package which resulted in a significant impact to the function of Diesel Generator 1A (Section M1.2)

## Report Details

### Summary of Plant Status

#### Unit 1

The unit operated at full power throughout the inspection period.

#### Unit 2

The unit began the inspection period operating at full power. On August 24, a manual reactor trip was initiated due to the closure of a main feedwater regulating valve as a result of loss of control power. Following troubleshooting and corrective actions, a reactor startup was initiated and Mode 2 was entered on August 26. Full power operation was obtained on August 27.

On September 4, the unit was manually tripped as a result of the loss of both main feedwater pumps during surveillance testing. After completion of troubleshooting and a root cause evaluation criticality was achieved on September 5, with nominal full power being reached on September 6. The unit remained at essentially 100% power the remainder of the inspection period.

## I. Operations

### **O1 Conduct of Operations**

#### O1.1 General Comments (71707)

The inspectors conducted reviews of ongoing plant operations. In general, the reviews indicated that the conduct of operations was professional and safety-conscious.

#### O1.2 Unit 2 Manual Reactor Trip

##### a. Inspection Scope (71707 and 93702)

The inspectors reviewed the circumstances surrounding the Unit 2 manual reactor trip on August 24.

##### b. Observations and Findings

A manual reactor trip of Unit 2 was initiated due to loss of the inverter and both primary and backup control power supplies to the Steam Generator (SG) #3 Main Feedwater Regulating Valve (MFRV), 2-FV-0530. The plant response to the trip was normal with no significant complications identified. The inspectors reviewed the sequence of events report and identified no significant abnormalities. The inspectors determined that the event review team adequately evaluated post-trip data, developed plans to determine the cause of the trip, and actions necessary for plant restart. During the review, the inspectors were informed that the operating crew held a special briefing in the control room to specifically review necessary actions to be taken if a loss of the backup control power supply occurred. This briefing was particularly noteworthy, in that, it enhanced the operators ability and awareness to respond to this event.

The licensee performed troubleshooting on the inverter and determined that a circuit card had failed. The licensee also determined that the loss of primary control power supply was due to a blown fuse that occurred as a result of a loose fuse holder. The cause of the backup control power supply failure was determined to be a faulty capacitor. Both power supplies were replaced prior to startup. Subsequent checks of other control power supplies identified two additional failures as a result of faulty capacitors. The licensee plans to address the potential failures of other capacitors by either replacing the capacitors or replacing the power supplies.

c. Conclusions

The inspectors determined that operator actions to initiate a manual reactor trip prior to automatic protection actuation was proactive. The rapid identification and response to decreasing steam generator level was indicative of good operator performance. Licensee actions appropriately addressed the cause of the trip and plant restart.

O1.3 Unit 2 Manual Reactor Trip

a. Inspection Scope (71707) (71750) (93702)

The inspectors reviewed the circumstances surrounding a Unit 2 reactor trip that occurred during the performance of a surveillance on September 4.

b. Observations and Findings

A manual reactor trip of Unit 2 was initiated in response to a loss of both main feedwater pumps during the performance of Surveillance 14601-2, "Engineered Safety Feature Actuation System Slave Relay And Final Device Train B Block Test," Revision (Rev.) 10. Post-trip plant response was normal and no significant complications were identified. The inspectors reviewed the sequence of events and observed that the manual reactor trip was performed prior to an automatic reactor trip due to decreasing steam generator water levels. Operations personnel stated that the pre-job briefing identified the possibility of loss of feedwater and addressed the expected operator responses. The inspectors determined that the event review team adequately evaluated post-trip data, developed plans to determine the cause of the trip, and actions necessary for plant restart.

Licensee troubleshooting activities identified that simultaneously depressing the feedwater pump tripping test circuit pushbuttons resulted in tripping both main feedwater pumps. Instrument and Control (I&C) personnel were unaware that depressing the feedwater pump trip test circuit pushbuttons simultaneously resulted in additive currents in the parallel test circuit which was sufficient to actuate the slave relay for tripping both feedwater pumps. The inspectors reviewed Surveillance 14601-2 and determined that depressing the pushbuttons simultaneously was not prohibited by the surveillance test.

The corrective actions included a procedure revision to address individual manipulation of the test pushbuttons. Other planned corrective actions included modification of the test circuits and a broadness review to identify similar conditions in other solid state protection system test circuits. Additionally, the licensee planned to add guidance on

the manipulation of Solid State Protection System (SSPS) test pushbuttons to the remaining SSPS surveillance procedures. The inspectors reviewed the corrective actions and determined that they adequately addressed the root cause of this event.

c. Conclusions

The inspectors concluded that the licensee's root cause investigation and subsequent corrective actions were thorough and addressed the causes of the reactor trip. Operations personnel had identified and previously discussed the possible loss of feedwater and responded in a timely and appropriate manner. The preparation, rapid identification, and response to the event was an indication of good performance by the operating crew.

**O2 Operational Status of Facilities and Equipment**

O2.1 Engineered Safety Feature Walkdown (71707)

The inspectors conducted a review of selected portions of the Auxiliary Feedwater System (AFW) for both units to verify component alignment and assess material conditions of the system and components. The inspectors concluded that the AFW for both units were properly aligned for operation; material conditions of the system components, and general areas were well maintained with no leaks observed. Technical Specification (TS) and Updated Final Safety Analysis Report (UFSAR) requirements were identified in the TS required surveillance procedure. Minor administrative procedure deficiencies were brought to the attention of the responsible system engineer.

**O5 Operator Training and Qualification**

O5.1 Plant Equipment Operator (PEO) Qualification (71707)

As part of NRC Inspection Procedure 71707, "Plant Operations," the inspectors reviewed the licensee's non-licensed operator qualification program.

The licensee has established the requirements for PEO qualification via a system master plan. Within the system master plan clusters and instructional units were completed to qualify for each specific building (i.e., turbine, auxiliary, and outside area buildings) plus basic PEO training. Upon satisfactory completion of these requirements, a PEO becomes fully qualified.

The inspectors reviewed classroom lesson plans, completed exam results, completion of instructional units and clusters for each specific building, a review of job performance measures, and observations of PEO rounds. The inspectors concluded that the system master plan provided an adequate method to qualify PEOs. The review of completed operator tasks indicated that no operator carried out duties that they were not qualified to perform. Currently qualified PEOs met established program requirements. The inspectors also concluded that trainer/evaluators were adequately qualified to perform evaluations of trainee performance.

**O7 Quality Assurance in Operations****O7.1 Licensee Self-Assessment Activities****a. Inspection Scope (40500)**

The inspectors reviewed the Plant Review Board (PRB) committee responsibilities and activities.

**b. Observations and Findings**

The inspectors observed six PRB committee meetings during this period. Several were normally scheduled PRB meetings and the majority of the items discussed were routine in nature. However, some meetings were called to address specific items such as the removal of fuel handling building post-accident ventilation ductwork and emergent issues with the diesel generator missile barrier exhaust structure modification. In addition, supplemental meetings were called to complete various reviews prior to the issuance of licensee event reports (LER) in response to plant events.

The inspectors observed that some discussions were not adequately focused on the agenda items being discussed. An example of this was the failure of PRB members to question an incomplete root cause and corrective action of an LER. The inspectors also observed that some of the PRB members had not reviewed the material disseminated prior to the meeting and several members had been engaged in other activities that had distracted them from reviews before the board.

**c. Conclusions**

The inspectors concluded that the observed PRB committee did not fully discuss the subjects presented and several members had not reviewed the material prior to meeting. These types of observations had not been typical in past PRB meeting observations.

**O8 Miscellaneous Operations Issues (92901)****O8.1 (Closed) VIO 50-424, 425/97-045-01014 and VIO 50-424/97-045-02014 (Escalated Enforcement Item 50-424, 425/96-14-03): Configuration Control Deficiencies Involving Mispositioned Components**

The licensee responded to this violation in correspondence dated April 17, 1997. The inspectors reviewed the licensee's corrective actions and determined that all of the actions were completed satisfactorily.

O8.2 (Closed) VIO 50-425/97-05-01: Anomalous Containment Sump Level Transmitter Behavior Not Identified by Licensee

The licensee responded to this violation in correspondence dated July 18, 1997. The inspectors verified the corrective actions described in the licensee's response. However, the licensee planned to complete only a portion of the work during the upcoming outage, and has rescheduled completion of the work during the following Unit 1 outage. Based on the revised plan, the inspectors concluded that the licensee's plan was adequate to address the identified containment sump level transmitter issues.

O8.3 (Closed) LER 50-424/97-008-00: Turbine Stop Valves' Closure Setpoints Not Properly Set

Guidance was added to procedure 28717-C, "Main Steam Stop Valve Limit Switch Location Verification," Rev. 5, to ensure the setpoint was established with the valve traveling in the closed direction. The inspectors reviewed the procedure and verified the revision was adequate to prevent recurrence.

O8.4 (Closed) LER 50-424/97-009-00: Containment Ventilation Isolation When Rad Monitor Not Blocked

This event is discussed in NRC Inspection Report 50-424, 425/97-10. No new issues were revealed by the LER.

## II. Maintenance

### **M1 Conduct of Maintenance**

#### M1.1 Maintenance Work Order and Surveillance Observations (61726) (62707)

The inspectors observed all or portions of various selected maintenance and surveillance activities. The observed maintenance and surveillance activities were generally completed by personnel knowledgeable of their assigned tasks. Procedures were present at the work location and being followed. Procedures provided sufficient detail and guidance for the intended activities. The inspectors concluded that routine maintenance and surveillance activities were satisfactorily performed.

#### M1.2 Emergency Diesel Generator (DG) Exhaust Missile Barrier Modification

##### a. Inspection Scope (62707)(37551)

The inspectors observed portions of the licensee's implementation of Design Change Package (DCP) 98-V1N0011 to replace the Unit 1 DG concrete exhaust missile barriers.

b. Observations and Findings

The DCP required that the existing concrete missile barrier be partially demolished and a temporary cover placed over the DG exhaust opening to prevent concrete debris from entering. The temporary cover was a metal box approximately 48 inches in width, height, and depth with solid sides except for the front side which was open with a screen to allow a flowpath for the DG exhaust. However, the licensee did not have sufficient controls in place to remove debris at a set interval. On August 24, the inspectors observed that debris had accumulated to a height of approximately 30 inches. This resulted in a major portion of the exhaust opening being blocked. Once aware of the issue, the licensee stopped work, declared the DG inoperable, and removed the debris. Work was completed on DG 1A missile barrier without further significant incidents. On September 1, the licensee determined that DG 1A would not have been able to perform its intended safety function in the condition observed. The licensee entered the appropriate TS Limiting Condition For Operation at the time of discovery.

The inspectors reviewed the licensee's corrective action. The licensee replaced the temporary cover with a different design that does not lend itself to the vulnerability of being blocked by debris; personnel responsible for the development of the DCP were counseled on their responsibilities and monitoring of field installation; and management expectation for controlling work on safety-related systems was re-emphasized.

Procedure 00400-C, Plant Design Control, Rev. 26, requires that during implementation of DCPs that controls be established and maintained to ensure that physical changes to the plant are controlled and the functions of safety related equipment are not impacted. The licensee failed to provide sufficient controls in DCP 98-V1N0011 to ensure that the demolition of the DG 1A concrete missile barrier precluded impact on the safety-related operation of the diesel.

c. Conclusions

The inspectors concluded that the licensee did not include adequate instructions in a design package used by field craftsmen which resulted in a significant impact to the operation of DG 1A. This issue was identified as VIO 50-424/98-07-01, "Diesel Generator 1A Inoperable Due to Exhaust Piping Blockage."

M1.3 Freeze Seal Activities (62707)

The inspectors observed installation of a freeze seal and maintenance activities associated with the replacement of Valve 2-PSV-8118. The freeze seal was properly installed and the replacement of the valve was successfully completed. The inspectors concluded that freeze seal and maintenance activities were completed thoroughly and professionally and in accordance with procedures.



**M8 Miscellaneous Maintenance Issues (92902)****M8.1 (Closed) Inspector Follow-up Item (IFI) 50-424, 425/98-02-03: Review of Surveillance Procedure Sequencing**

The licensee initiated a procedure review under commitment tracking number CO0038258. The review included identifying surveillances and procedures that were, or may be, performed concurrently. The licensee plans to revise identified procedures to address the procedure sequencing when performed concurrently. The inspectors reviewed the screening process and found it was thorough and resulted in the appropriate procedures being identified and prioritized prior to the next refueling outage. The inspectors concluded that the procedure review was adequate.

**M8.2 (Closed) IFI 50-424, 425/98-01-02: Maintenance Rule Periodic Assessment (MRPS)**

The licensee conducted the MPA June 1-5, 1998. This assessment covered: the Unit 1 portion of Operating Cycle No. 7 after July 1, 1996 and the portion of Operating Cycle No. 8 before May 1, 1998, and the Unit 2 portion of Operating Cycle No. 5 after July 1, 1996 and the portion of Operating Cycle No. 6 before May 1, 1998. The MRPA was conducted by a team of twelve personnel, including a PRA consultant and representatives from the Farley, Hatch, Robinson and Sequoyah nuclear power plants. The MRPA team's findings were presented to plant management on June 5, 1998. The MRPA was issued by memorandum dated August 10, 1998.

The inspectors reviewed the licensee's report. The assessment was comprehensive; identified approximately 33 issues, 16 strengths, 31 weaknesses; and made 64 recommendations. The inspectors concluded that the licensee's MRPA met the requirements of the Maintenance Rule.

**M8.3 (Closed) VIO 50-425/98-03-04: Failure of Contractor Examiner to Implement a PT Procedure Requirement**

The licensee responded to this violation in correspondence dated June 8, 1998. To evaluate the effectiveness of the licensee's corrective actions, the inspectors examined selected records, examined PT examination sites, and interviewed licensee personnel. The inspectors determined that the licensee took appropriate corrective actions and conducted an adequate survey to determine the extent of the problem.

**V. Management Meetings and Other Areas****X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on September 29, 1998. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Gasser, Nuclear Plant General Manager  
 S. Chestnut, Plant Operations Assistant General Manager  
 P. Rushton, Plant Support Assistant General Manager  
 G. Frederick, Manager Operations  
 K. Holmes, Manager Maintenance  
 M. Sheibani, Nuclear Safety and Compliance Supervisor  
 C. Tippins, Jr., Nuclear Specialist I

## INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering  
 IP 40500: Effectiveness of Licensee Controls In Identifying, Resolving, and Preventing Problems  
 IP 61726: Surveillance Observation  
 IP 62707: Maintenance Observation  
 IP 71707: Plant Operations  
 IP 71750: Plant Support  
 IP 92901: Followup - Operations  
 IP 92902: Followup - Maintenance/Surveillance  
 IP 93702: Prompt Onsite Response to Events at Operating Power Reactors

## ITEMS OPENED AND CLOSED

Opened

50-424/98-07-01 VIO Diesel Generator 1A Inoperable due to Exhaust Piping Blockage (Section M1.2)

Closed

50-424, 425/97-045-01014 VIO Configuration Control Deficiencies Involving Mispositioned Components (Section O8.1)  
 50-424, 425/97-045-02014 VIO Configuration Control Deficiencies Involving Mispositioned Components (Section O8.1)  
 50-425/97-05-01 VIO Anomalous Containment Sump Level Transmitter Behavior Not Identified By Licensee (Section O8.2)  
 50-424/97-008-00 LER Turbine Stop Valves' Closure Setpoints Not Properly Set (Section O8.3)  
 50-424/97-009-00 LER Containment Ventilation Isolation When Rad Monitor Not Blocked (Section O8.4)

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|----------------------|-----|---|
| 50-424, 425/98-02-03 | IFI | Review of Surveillance Procedure Sequencing (Section M8.1)                            |
| 50-424, 425/98-01-02 | IFI | Maintenance Rule Periodic Assessment (Section M8.2)                                   |
| 50-425/98-03-04      | VIO | Failure of Contractor Examiner to Implement a PT Procedure Requirement (Section M8.3) |