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

Report No.: 50-424/86-118

Licensee: Georgia Power Company
P. O. Box 4545
Atlanta, GA 30302

Docket No.: 50-424 License No.: CPPR-108

Facility Name: Vogtle 1

Inspection Conducted: November 12-24, 1986

Inspectors: L. Nicholson 12/22/86
L. Nicholson Date Signed

for M. Thomas 12/23/86
M. Thomas Date Signed

L Nicholson for Schnebli 12/22/86
G. Schnebli Date Signed

Approved by: Frank Jape 12/23/86
F. Jape, Chief Date Signed
Test Programs Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection was conducted in the areas of preoperational test witnessing and review.

Results: One violation was identified - Failure to adequately document and evaluate diesel generator performance.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

*R. E. Conway, Senior Vice-President, Vogtle Project Director
*P. D. Rice, Vice-President, Vogtle Project
*R. H. Pinson, Vice-President, Project Construction
*C. E. Belflower, Quality Assurance Site Manager - Operations
*R. M. Bellamy, Project Manager
*W. C. Gabbard, Senior Regulatory Specialist
*A. L. Mosbaugh, Superintendent, Engineering Services
J. Aufdenkampe, Lead Test Supervisor

Other licensee employees contacted included engineers, technicians, operators, mechanics, and office personnel.

Other Organization

H. M. Handfinger - Assistant Startup Manager, Bechtel

NRC Resident Inspectors

*J. Rogge, Senior Resident Inspector - Operations
*R. J. Schepens, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 21 and 24, 1986, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

Violation 424/86-118-01, Failure to Adequately Document and Evaluate Diesel Generator Performance - paragraph 6.b.

Inspector Followup Item 424/86-118-02, Investigate 4.16 kV Switchgear Racking Incidents - paragraph 7.b.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during the inspection.

5. Preoperational Test Procedure Review (70304, 70305, 70306)

The inspectors reviewed preoperational (preop) test procedure 1-300-01, Integrated Safeguards and Load Sequencing Test, to verify that it was consistent with applicable portions of FSAR Chapters 6, 7, 8, 9 and 14; Safety Evaluation Report (SER) and its supplements; and, Regulatory Guides (RGs) 1.68, 1.79 and 1.108. The review included verifying that pertinent prerequisites were identified; initial test conditions and system status were specified, acceptance criteria were specified; the required reviews were performed; and, management approval was indicated.

No violations or deviations were identified in the areas inspected.

6. Preoperational Test Results Review

a. The inspectors reviewed the results of the preop tests listed below. The test results were reviewed to verify that:

- Test changes were approved in accordance with administrative procedures.
- Test changes did not change the basic objective of the test.
- Actions required by test changes had been completed.
- Test deficiencies had been resolved, including retesting where required.
- Individual test steps and data sheets were completed properly.
- Test data were within the acceptance criteria specified.
- Evaluation and approval of the test results had been completed by appropriate engineering and management personnel.

Results for the following tests were reviewed:

1-3BJ-02, Safety Injection Check Valve

1-3KJ-04, Diesel Generator Train B Switchgear, Controls, and Auxiliaries

1-3KJ-06, Diesel Generator Train B Sychronization, Load Rejection, Five Air Starts, and 35 Consecutive Starts

1-300-10, Remote Shutdown

Procedures 1-3KJ-04 and 1-3KJ-06 still had a few minor outstanding items to be completed. These partial test results packages have been reviewed and approved by the licensee. The inspectors will review the resolution of the outstanding items during a followup inspection after the items have been completed and the results receive final approval. Procedures 1-300-10 and 1-3BJ-02 had received final review and approval.

All questions raised during review of these procedures were resolved except one. The question concerned some of the data taken for the Train B remote shutdown room. This question will be reviewed during a followup inspection.

No violation or deviations were identified.

b. The inspectors reviewed the documentation of diesel generator start attempts that have occurred since the completion of the reliability tests (35 starts) per test procedures 1-3KJ-05 and 1-3KJ-06. Instructions for the operation of the diesel generators are contained in a general operating procedure 13145-1, Diesel Generators, and a surveillance procedure 14980-1, Diesel Generator Operability Test. Both procedures require that all start attempts be logged in the Shift Supervisor's logbook with specific information to include the start time, reason for start and the success or failure of the start attempt. Revision 1 to the above procedures, dated November 7, 1986, and September 23, 1986, respectively, adds a further requirement to document and forward this information to the Engineering Support Superintendent, whom is tasked with tracking and evaluating each start attempt.

A review of the Shift Supervisor's logbook revealed that most log entries contain only the time and diesel that is started. The Engineering Support Superintendent had received documentation of only two start attempts. Discussions with key operations, test and engineering personnel indicated a general confusion over the lines of responsibility. The inspectors noted for example that on November 8, 1986, Diesel Generator "B" was started per surveillance procedure 14980-1. Discussions with the personnel involved revealed that a procedure sequence error caused the generator to unsuccessfully accept and carry the load. The surveillance procedure was subsequently changed and reperformed successfully. The licensee could produce no documentation of evaluation of this failed start attempt to the Engineering Support Superintendent. The Shift Supervisor's log entry was of insufficient detail to permit a meaningful evaluation of the failure.

RG 1.108, Periodic Testing Of Diesel Generator Units Used As Onsite Electric Power Systems At Nuclear Power Plants, as stated in Regulatory Position C.3.a, that all starts attempts, including those from bona fide signals, should be logged. The log should describe each occurrence in sufficient detail to permit independent determination of

the validity of each start in accordance with Regulatory Position C.2.e. Cumulative analysis should include examination of the trend of critical failure mechanisms, human errors, and common mode failures. Subsequent intervals for periodic testing should depend on this demonstrated performance. The inspectors noted that the documentation available for most start attempts on the diesel generators performed since the completion of the reliability tests per test procedures 1-3KJ-05 and 1-3KJ-06 lack sufficient detail to permit independent determination of statistical validity of each start. The licensee acknowledged this finding and has formulated an effort to gather as much information as possible for each diesel generator start attempt. Failure to adequately document with sufficient detail and evaluate diesel generator start attempt violates 10 CFR 50, Appendix B, Criterion V, which states that activities affecting quality shall be prescribed by and accomplished in accordance with documented instructions, procedures or drawings. This item will be identified as Violation 424/86-118-01, Failure to Adequately Document and Evaluate Diesel Generator Performance.

7. Preoperational Test Witnessing

The inspectors observed specific tests being conducted to determine if requirements were being met relative to NRC requirements such as contained in RG 1.68 and the Final Safety Analysis Report (FSAR). The following attributes were among those verified in this review.

- Tests were performed in accordance with approved procedures.
- Latest revisions of the approved test procedures were available and in use by personnel performing the tests.
- Test equipment required by the procedures was calibrated and installed.
- Test data were properly collected and recorded.
- Adequate coordination existed among personnel involved in the test.
- Test prerequisites were met.
- Proper plant systems were in service.
- Temporary modifications such as jumpers were installed and tracked in accordance with administrative controls.
- Problems encountered during testing were properly documented.

The following tests were witnessed:

a. Procedure 1-300-01, Engineered Safety Features Actuation System (ESFAS) Test (70315, 70316)

The inspectors witnessed portions of Section 6.1 of the test. In this portion of the test, an ESFAS signal was actuated on Train A, followed approximately five minutes later by a simulated loss of offsite power (LOP) in conjunction with the ESFAS signal. Train B was de-energized during this portion of the test.

During performance of the test on November 18, 1986, all equipment appeared to perform as required in response to the ESFAS actuation signal. However, after the LOP was actuated, several problems were identified concerning equipment response to the LOP. Some of the more significant problems identified included:

(1) Centrifugal Charging Pump (CCP) A did not restart.

(2) The Nuclear Service Cooling Water (NSCW) pumps cycled off and on.

(3) The ESF chiller did not restart.

(4) Power was lost to the emergency response facility (ERF) computer, which was being used to verify valve positions during the test.

(5) The post LOCA cavity purge fan tripped.

After performing the largest single load and 100% load rejection tests on the diesel generator (these tests were also a part of Section 6.1 but were not affected by the ESFAS/LOP problems), the licensee discontinued ESFAS testing while troubleshooting was being performed to determine the causes of the problems. Through troubleshooting and analysis of test data, the licensee was able to determine the causes of the various problems. Several design changes were implemented to correct the problems. In order to test the design changes, the licensee wrote several start-up operating instructions (SOI) to re-perform portions of preop test 1-300-01. The SOIs were not intended to be a substitute nor take credit for any portions of preop test 1-300-01. The inspectors witnessed performance of several of the SOIs. Additional problems were identified during performance of the SOIs which resulted in more design changes being implemented. One of the more significant problems occurred during performance of SOI-155 on November 23, 1986. An ESFAS only signal was actuated but a simultaneous LOP also occurred. The emergency bus did not load shed after the LOP which, according to licensee personnel, resulted in an instantaneous loading on the Train A Diesel Generator (DG) of approximately 2000 KW-2500KW. The licensee was analyzing the test data in order to determine why the LOP occurred and why the emergency bus did not load shed. It was speculated that the problem may be related

to the Train A sequencer because prior to performing SOI-155, the licensee had replaced the Train A sequencer logic card with one from Unit 2. The Unit 2 sequencer card had been tested prior to leaving the vendor's shop, but had not been preop tested at Vogtle. The original Train A sequencer card was reinstalled and the SOI re-preformed. The ESFAS signal was actuated and the problem with a simultaneous LOP and no load shedding did not occur. The Unit 2 sequencer card was sent back to the vendor for further testing in order to determine if there was a problem with the card. An evaluation was being performed to determine what affect did the instantaneous loading have on the DG. The licensee had not received the test results from the vendor and the other problems identified during performance of SOI-155 were still being evaluated at the conclusion of this inspection. The licensee stated that ESFAS testing would not resume until the problems were resolved. The licensee further stated that all of ESFAS testing performed thus far would be repeated, including the DG load rejection tests (which was being repeated because of the excessive instantaneous loading). The inspectors will review licensee efforts to resolve the problems identified during ESFAS and SOI testing and will continue to witness ESFAS testing during a followup inspection.

b. 1-3BC-01, Residual Heat Removal (RHR) System (70436)

The inspectors witnessed portions of Section 6.19 that verifies RHR system performance during filling and draining of the reactor cavity. During performance of Section 6.19.8 that pumps water from the reactor vessel to the refueling water storage tank, the RHR pump 2 failed to start when the control switch 1-HS-0620 at Control Room Panel QMCR was placed in the "Start" position. Operators were dispatched to troubleshoot the problem and discovered that the 4.16KV Brown-Boveri Switchgear for the pump had not been correctly racked in. Discussions with control room operators and a review of incident reports indicated that numerous problems of this nature have occurred during the testing program. The licensee has demonstrated their concern over this problem by creating a task force to investigate and determine the necessary corrective action. A previous investigation was conducted by the licensee regulatory compliance section as documented in a memorandum, dated October 27, 1986. The result of this effort indicates operator error in racking the breakers as a root cause. The licensee stated that subsequent operator training has been implemented and the problem continues to occur. This item will be identified as Inspector Followup Item (IFI) 86-118-02, Investigate 4.16KV Switchgear Racking Incidents.

No violations or deviations were identified in the areas inspected.