

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-443/84-05

Docket No. 50-443

License No. CPPR-135 Priority -- Category B

Licensee: Public Service Company of New Hampshire

1000 Elm Street

Manchester, New Hampshire 03105

Facility Name: Seabrook Station, Unit 1

Inspection At: Seabrook, New Hampshire

Inspection Conducted: April 17-20, 1984

Inspectors: L. E. Briggs 5/31/84  
L. Briggs, ~~Lead~~ Reactor Engineer date

Approved by: L. Bettenhausen 5/31/84  
L. Bettenhausen, Chief, Test Programs date  
Section

Inspection Summary: Inspection on April 17-20, 1984 (Report No. 50-443/84-05)

Areas Inspected: Routine, unannounced inspection by one region-based inspector (24 hours) of previous inspection findings, vendor diesel generator test witnessing, preoperational test procedure review, and a facility tour.

Results: No violations were identified.

8406230526 840606  
PDR ADOCK 05000443  
G PDR

## DETAILS

### 1. Persons Contacted

- \*J. Azzopard, Field Quality Assurance (QC) Engineer
- F. Beake, Senior QA Engineer
- \*D. Covill, Construction Field QA Surveillance Supervisor
- R. Griffen, Test Engineer, Startup Test Department (STD)
- D. Groves, Senior QA Engineer
- \*J. Grusetskie, Site Engineering
- \*R. Guillette, Supervisor, Construction QA Engineering
- \*R. Jamison, Electrical Engineer
- \*G. Kann, Test Group Supervisor, Phase 2-6
- J. Kotkowski, Test Director (Diesel Engines)
- \*D. Lambert, Field Supervisor, UE&C QA
- R. Magee, Vendor Representative, Colt Industries
- D. McLain, Startup Manager
- J. Metzger, Test Engineer, STD
- W. Middleton, QA Specialist
- \*B. Mizzau, Field QA Engineer
- A. Neilson, QA
- H. Schiefer, System Test Engineer, Electrical, STD
- J. Singleton, Construction Field QA Manager
- A. Smith, System Test Engineer, Mechanical, STD
- J. Tefft, STD Special Assistant
- \*W. Temple, QA Engineer
- C. Vaske, Vendor Representative, Woodward Governors

#### Other NRC Personnel Present

- \*A. Cerne, Senior Resident Inspector
- J. Grant, Reactor Engineer
- \*H. Wescott, Resident Inspector

\*Denotes those present at the April 20, 1984 exit meeting.

### 2. Follow-up of Previous Inspection Finding

(Closed) Unresolved Item (83-16-02) Licensee to provide QA/QC notification statement on acceptance tests (AT) covered by RG 1.68 and to annotate the AT index to indicate which AT's are affected. The licensee decided to include the QA/QC notification statement in all AT's. Those that have been reviewed by the inspector now contain the notification statement. The latest index of AT's, dated March 1, 1984, contains an asterisk by each AT that is addressed by RG 1.68. The inspector compared the index to RG 1.68 and found it acceptable.

### 3. Witnessing of Vendor Testing of Emergency Diesels Generators

#### 3.1 Test Witnessing Scope

Testing witnessed by the inspector included the following observations of overall crew performance:

- Approved procedure with latest revision available and in use by test personnel;
- A designated person in charge and conducting the test;
- Minimum test personnel requirements met;
- Qualified personnel performing the test;
- Test precautions followed and prerequisites met;
- QA/QC hold and witness requirements met;
- Proper plant supporting systems in service;
- Special test and measuring equipment required by the test procedure, its calibration and use;
- Procedure is technically adequate for the test;
- Testing being performed as required by the test procedure; and,
- Test personnel actions appeared to be correct and timely during performance of the test.

The inspector also reviewed the following documents as part of the inspection criteria:

- IEEE 387-1977, IEEE Standard Criteria for Diesel Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations;
- UE&C Specification 9763-006-201-1, Emergency Diesel Generator Sets, through Revision 4 (January 31, 1984); and,
- RG 1.108, Periodic Testing of Diesel Generator Units used as Onsite Electrical Power Systems at Nuclear Power Plants, Revision 1, August, 1977.

#### 3.2 Vendor Tests of 'B' Emergency Diesel Generator

The inspector observed vendor (Colt Industries) check out and operation of the 'B' Emergency Diesel Generator (EDG) on April 18 and 19,

1984. The EDG is a Colt/Pielstick turbocharged 16 cylinder 'V', 4 cycle diesel engine, Model PC2V00. There are 2 EDG's for unit 1, each is rated at 6083 KW continuous with an overload rating of 6691KW. The mechanical checkout of the EDG was conducted using a vendor prepared "Engine Start-up Check List". The electrical tests were conducted under Seabrook Station General Test Procedure, GT-E-111, "Initial Field Flashing, Excitation and Paralleling "1B" Diesel Generator with Emergency Bus E6", Revision 0, Joint Test Group (JTG) approved April 12, 1984. Testing of the 'A' EDG through 100% load test and the 'B' EDG up to the 100% load test was observed by the Resident Inspector and will be documented in NRC Inspection Report 50-443/84-04. Vendor full load testing of the 'B' EDG was successfully completed on April 19, 1984.

### 3.3 Problems Experienced and Resolution

- EDG B tripped on overspeed on first start attempt when one of the main air start valves stuck open. The main air start valves are actuated (open) by air applied to a small piston via the air start solenoid valves. The valves are closed by a spring when the solenoid valves deenergize and bleed air off the piston. The solenoid valves are deenergized when EDG speed reaches approximately 95 RPM. The vendor and the licensee disassembled the main air start valves and found one valve had a small amount of rust on the plunger. The valves were cleaned and reassembled and new air filters were installed in the air lines. Valve operation was checked by air rolling the diesel (fuel racks held out) and one main air start valve again struck open. The valves were again disassembled and taken to a maintenance shop where they were reworked and tested satisfactorily. The vendor also checked air solenoid operation by securing starting air and energizing the solenoids and simulating diesel RPM to ensure the solenoids energized and deenergized properly. Solenoid operation was correct.
- EDG 'B' tripped on low lube oil pressure on the April 19, 1984 first (cold start) attempt with starting air applied to only 8 EDG cylinders. The EDG has a redundant air start system, each system (1 air receiver for each bank of 8 cylinders with a cross connect valve) supplies starting air to 8 EDG cylinders. Normal lineup is starting air to all 16 EDG cylinders. The EDG is required to start with starting air to only 8 of the 16 cylinders; however, the 'B' EDG attached lube oil pump does not build lube oil pressure to the required pressure within the allowed 7 seconds with air applied to only 8 cylinders on the first (cold) diesel start. This problem was not apparent on 'A' EDG and does not affect the 'B' EDG on the second and subsequent starts. On first start attempts, the lube oil pressure reaches the required value within  $\frac{1}{2}$  second of the allowed 7 seconds. The inspector discussed this with licensee management and reviewed Section

9.5.6 of the FSAR. The FSAR requires the redundancy of the air start system to be verified during preoperational testing. Licensee management is aware of the problem and the FSAR requirement and will ensure redundancy of the EDG air start system is tested during the preoperational test. The licensee plans to contact vendor management to discuss and resolve this problem. This item will be followed during a subsequent NRC inspection (443/84-05-01).

#### 4. Preoperational Test Review and Verification

The following procedures were reviewed in preparation for test witnessing, for technical and administrative adequacy and for verification that testing is planned to adequately satisfy regulatory guidance and licensee commitments. The procedures were reviewed to verify licensee review and approval, proper format, test objectives, prerequisites, initial conditions, test data recording requirements, technical adequacy and system return to normal.

- 1-PT-23, Containment Enclosure Exhaust System, Revision 1, JTG approved March 28, 1984;
- 1-PT-12.2, Containment Spray Nozzle Test, Revision 1, JTG approved March 28, 1984;
- 1-PT(I)-1.2, Reactor Coolant Pumps Hot Functional, Revision 0, JTG approved March 14, 1984;
- 1-PT(I)-2.2, Pressurizer Relief Tank Hot Functional Test, Revision 1, JTG approved March 28, 1984;
- 1-PT-26, Containment Air Recirculation System, Revision 0, JTG approved March 14, 1984; and,
- 1-PT-1.56, Cooling Tower Pump Performance at Various Water Levels, Revision 1, JTG approved March 14, 1984.

The above procedures were found acceptable. The inspector had no further questions at this time.

#### 5. Plant Tours

The inspector made several tours of various areas of the facility to observe work in progress, housekeeping, cleanliness controls, and status of construction and preoperational testing activities.

No unacceptable conditions were noted.

6. Exit Interview

A management meeting was held at the conclusion of the inspection on April 20, 1984 to discuss inspection scope and findings as detailed in this report (see Paragraph 1 for Attendees). No written information was provided to the licensee at any time during the inspection.