

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-443/86-01

Docket No. 50-443

License No. CPPR-135 Priority - Category B

Licensee: Public Service of New Hampshire  
P. O. Box 330  
Manchester, New Hampshire 03105

Facility Name: Seabrook Station, Unit 1

Inspection At: Seabrook, New Hampshire

Inspection Conducted: January 6-10, 1986

Inspectors: *H. F. van Kessel* 1/28/86  
H. F. van Kessel, Reactor Engineer date

*L. Briggs* 1/28/86  
L. Briggs, Lead Reactor Inspector date

*P. W. Eselgroth* 1/28/86  
for H. H. Nicholas, Startup Consultant date

Approved by: *P. W. Eselgroth* 1/28/86  
P. W. Eselgroth, Chief, Test Programs date  
Section, OB, DRS

Inspection Summary:

Inspection on January 6-10, 1986 (Inspection No. 50-443/86-01)

Areas Inspected: Routine unannounced inspection of the Preoperational Test Program including the review of preoperational test procedures, the evaluation of the test results of completed tests, test program review, independent verification, review of activities in QA/QC interface for POT program, and Plant Tours. The inspection covered 86 manhours onsite by two region-based inspectors and one NRC engineering consultant.

Results: No violations were identified.

## 1.0 Persons Contacted

- \*J. Azzopardi, Quality Assurance Engineer (NHY)
- \*D. R. Jaquette, Licensing Engineer (YAEC)
- \*G. A. Kam, Phase 2-6 Test Group Manager (NHY)
- \*D. C. Lambert, Project Field QC Manager (UE&C)
- \*D. F. Lynch, Startup QA (YAEC)
- \*D. McLain, Startup Manager (NHY)
- \*D.W. Perkins, Quality Assurance Engineer (YAEC)
- \*L. Rau, Reactor Startup Supervisor (NHY)
- \*J. W. Singleton, Assistant QA Manager (YAEC)
- \*J. G. Tefft, STD - Special Assistant (NHY)
- \*D. F. Turner, Quality Assurance Engineer (YAEC)
- T. Waechter, Startup Test Engineer (NHY)

### Other NRC Personnel Present

- \*R. Barkley, Reactor Engineer
- \*A. Cerne, Senior Resident Inspector
- \*D. Ruscitto, Resident Inspector

\*Denotes those present at January 10, 1986 exit meeting.

## 2.0 Followup of Previous Inspection Findings

(Open) Unresolved Item (443/85-02-01), licensee to revise 1-PT-27.1, "Fuel Storage Building Ventilation" and 1-AT-31, "Seismic Monitoring" to require attachment of General Tests (GT-M-03 and GT-I-111) used to satisfy FSAR Chapter 14 commitments. The licensee stated that the above revision would be accomplished during the final procedure review just prior to performance of the test procedure. This item remains open pending procedure revision and subsequent NRC review.

(Open) Unresolved Item (443/85-12-02), "Emergency Diesel Generator (EDG) Testing Scope." This item concerned ECCS load sequencing onto the EDG immediately following the 24 hour full load run. This item was discussed in detail in Paragraph 2 of Inspection Report No. 50-443/85-21. 1-PT(I)-39.1, Loss of Offsite Power Test, during which this item will be tested, had not, at the conclusion of this inspection, been reviewed and approved by the Joint Test Group (JTG). This item remains open pending NRC review of 1-PT(I)-39.1 after final licensee approval.

(Open) Unresolved Item (443/85-26-02), licensee to perform engineering evaluation of the service water system to determine if operating restrictions must be imposed on the cooling towers (ultimate heat sink). The licensee stated that the evaluation was in progress but not yet complete. It was also noted that preliminary indications, based on hot functional test results, were that no operating restrictions would be required. This item remains open pending completion of the engineering evaluation and subsequent NRC review.

### 3.0 Preoperational Test (POT) Program

#### 3.1 POT Program Review

##### References

- (1) Startup Manual
- (2) FSAR, Chapter 14
- (3) Regulatory Guide 1.68, Revision 2, "Initial Test Programs for Water Cooled Nuclear Power Plants"
- (4) NRC Inspection Report No. 50-443/83-16, issued November 15, 1983

##### Scope

A review of the preoperational test program was conducted to verify adherence to the requirements and commitments of documents (2) and (3) referenced above.

##### Discussion

A general review was made of the administrative procedures, Test Program Instructions (TPIs), which are a part of the Startup Manual. These TPIs were compared with the commitments made in the FSAR, Chapter 14 (Ref. 2) and the requirements of the Regulatory Guide 1.68 (Ref. 3) to verify that the administrative measures have been established to control the conduct of preoperational testing including:

- (1) Preoperational Test Program description;
- (2) A method to control turnover of systems from the constructor to the Startup department (STD) and, subsequently, from STD to the operations department;
- (3) Preoperational Tests for the plant systems listed in Regulatory Guide 1.68;
- (4) A formal method to control preoperational test procedure format, content, review and approval, and changes to procedures;
- (5) A formal method to control interruption of testing and retest requirements;
- (6) A formal method to control calibration and issuance of measuring and test equipment; and
- (7) A method to control lifted lead, jumpers and safety tagging.

In view of the status of the preoperational testing (post HFT), special attention was paid to items 4 and 5. The following areas of concern resulted from the review of these items:

- a. Retesting for phase 1 and 3 POTs. Who decides whether the retest will be a phase 1, 2 or 3 test?
- b. Retest records review and approval.
- c. Retest record retention and retrieval.
- d. Prioritization of incomplete items by startup milestone.

These areas of concern were discussed with the licensee. With reference to a. above, the Joint Test Group (JTG) will review and approve the retest procedure selected by the responsible startup engineer, who will base his selection on the impact which the test deficiency had on the preoperational test.

With reference to b. and c. above, retest records will be reviewed and approved by the JTG. These test records will be added to the test package for the pertinent completed test.

With reference to d. above, the licensee indicated that some prioritization has been done already. In view of the small number of incomplete items generated to date, prioritization is not considered to be a significant problem.

### Findings

Within the scope of this inspection, no violations were observed.

## 3.2 Preoperational and Acceptance Test Results Evaluation Review

### Scope

The completed test procedures listed in Attachment A were reviewed during this inspection to verify that adequate testing had been conducted to satisfy regulatory guidance, licensee commitments and FSAR requirements and to verify that uniform criteria are being applied for evaluation of completed test results in order to assure technical and administrative adequacy.

The inspector reviewed the test results and verified the licensee's evaluation of test results by review of test changes, test exceptions, test deficiencies, "As-Run" copy of test procedure, acceptance criteria, performance verification, recording conduct of test, QC inspection records, restoration of system to normal after test, independent verification of critical steps or parameters, identification of personnel conducting and evaluating test data, and verification that the test results have been approved.

### Discussion

- PT(I)-9, Revision 2, "ECCS HOT Functional Test." Check valve leakage for many valves initially was found to be in excess of the acceptable values shown in the procedure. Additional flushing and cleaning of the associated piping brought these leakages back within the acceptable values. The basis for the acceptance criteria, as shown in the procedure, was not provided in same. The licensee stated that the numbers in the procedure are based on 10 cc/hr per inch of nominal pipe diameter. The source of this number was not known nor was it shown as a reference in the procedure. The inspector will follow up on this item in a future inspection.

The inspector noted that, in F.C. #5, the minimum recirculation flow rate of the pump had been cut back from 90 to 40 gpm. A reason for this change was not supplied in FC #5. The licensee said that the 90 gpm was intended for two pumps. Since they were only using one pump, the minimum flow could be cut back to 45 gpm (or as low as 40.5 gpm with the -4.5 gpm tolerance) without overheating the pump. The actual value found in the field was 42 gpm which is above the minimum acceptable value of 40.5 gpm.

The inspector had no further questions on this procedure.

### Findings

No discrepancies or violations were identified during the above review. There were, however, several open test exceptions that require licensee corrective action to resolve. These test exceptions were assigned to the incomplete items list (IIL) or, in certain cases, a work request (WR) was issued for tracking purposes. The following open test exceptions, identified in previous NRC reports, are being consolidated into one unresolved item (443/86-01-01) and unresolved items 443/85-26-01 and 443/85-30-02 are closed.

The following IIL numbers correspond to open test exceptions and, collectively, constitute unresolved item 443/86-01-01.

<u>Procedure No.</u>	<u>Short Title</u>	<u>ILL No.</u>
1-PT(I)-35	RCS Hydro	RC-0684, RC-0763, RC-0696, RC-0698, RC-0802, RC-0847, RC-848, RC-849, RC-850, RC-852
1-PT-17.1	Spent Fuel Cooling	SF-0163
1-PT-17.2	Spent Fuel C/U	SF-0161 and SF-0162

<u>Procedure No.</u>	<u>Short Title</u>	<u>ILL No.</u>
1-PT-10	SI Accum. Blowdown	SI-0426 and Active Work Request SI-0425
1-AT-13.1	Fire Pump Flow Cap.	FP-0420 and FP-0419
1-PT-8	ECCS Performance	SI-0459, SI-0458 and RH-0400
1-PT-18.1	Nuclear Instrumentation	NI-0093, NI-0094 and NI-0092
1-PT-12.1	Containment Spray	CBS-0595 and CBS-0594
1-AT-3.1	Condensate	CAS-0192
1-PT(I)-1	Reactor Coolant Pumps	Work Request No. RC-0804
1-PT-5.1	CVCS Charging System	CS-1012
1-PT-6.1	CVCS, Boron Thermal Regeneration	CS-1450
1-PT(I)-13.2	MSIVs	MS-1222
1-PT(I)-14.2	Emergency Feedwater	FW-1270 and FW-1223
1-PT(I)-40.7	Condenser Steam Dump	MS-1140, MS-1320 and WR-MS-1335
1-AT-1.3	Startup Feedwater Pump	FW-1028

#### 4.0 QA/QC Interface

##### Scope

Startup QA surveillance reports were reviewed for coverage of the Hot Functional Test.

##### Discussion

Startup QA surveillance reports as identified in Attachment B were reviewed for scope of inspection and the nature of their findings. All of these reports are related to the Hot Functional Tests. Good coverage was provided for these tests.

##### Findings

No noncompliances were identified by the inspector within the scope of this review.

#### 5.0 Independent Verification

The inspector performed independent calculations of pump head values for the emergency feedwater pumps during test results review discussed in Paragraph 3.2 of this report.

## 6.0 Plant Tours

The inspector, accompanied by the Resident Inspector, made a tour of the facility. Areas toured included the containment, the fuel storage building, control building, the primary auxiliary building, emergency feedwater pump house, the diesel generator building, turbine building and the heater bay. The inspector observed work in progress, housekeeping, cleanliness control, and status of construction activities. The following observations were made:

- The emergency diesel generators (EDGs), Colt-Pielstick units, had good piping layout for fuel oil and lube oil, and fire secure mounting of fuel oil filters. The brush holders support bars, which are identical to the original bars of the Millstone 3 EDGs, had not been replaced yet but were scheduled to be in the near future.
- Good main control board panel layout with simple and effective mimics.
- Heavy dust layers on cables in cable trays of the Turbine Building.
- Crane layout in Fuel Building to meet heavy load criteria.

No violations were identified.

## 7.0 Unresolved Items

Unresolved items are matters about which more information is required in order to determine whether they are acceptable, an item of noncompliance or a deviation. An unresolved item concerning open test exceptions is discussed in Paragraph 3.2 of this report.

## 8.0 Exit Interview

At the conclusion of the site inspection on January 10, 1986, an exit interview was conducted with the licensee's senior site representatives (denoted in Section 1). The findings were identified and previous inspection items were discussed.

At no time during this inspection was written material provided to the licensee by the inspector. Based on the NRC Region I review of this report and discussions held with licensee representatives during this inspection, it was determined that this report does not contain information subject to 10 CFR 2.790 restrictions.

ATTACHMENT A

PREOPERATIONAL AND ACCEPTANCE TEST RESULTS REVIEWED

- 1-PT(I)-2.2, Pressurizer Relief Tank Hot Functional Test, Revision 3, results approved on December 18, 1985.
- 1-PT(I)-6.2, Boron Thermal Regeneration System Hot Functional Test, Revision 2, results approved on December 18, 1985
- 1-PT(I)-9, ECCS Hot Functional Test, Revision 2, results approved on December 30, 1985.
- 1-PT(I)-13.2, Main Steam Line Isolation Valves Hot Functional Test, Revision 0, results approved on December 4, 1985.
- 1-PT(I)-14.2, Emergency Feedwater System (HFT), Revision 0, results approved on December 18, 1985.
- 1-PT(I)-40.7, Condenser Steam Sump System, Revision 0, results approved on December 11, 1985.
- 1-PT(I)-40.10, Heat Removal Demonstration Test, Revision 1, results approved on December 11, 1985.
- 1-AT-1.3, Startup Feed Pump Test, Revision 1, results approved on October 25, 1985.
- 1-AT-24.1, Electrical Penetration Area Air Conditioning System, Revision 2, results approved on September 30, 1985.
- 1-AT(I)-24.2, Electrical Penetration Area Hot Functional Test, Revision 1, results approved on November 22, 1985.
- 1-AT-42.2, Electro-Hydraulic Control Fluid System, Revision 1, results approved on September 30, 1984.

ATTACHMENT B

TO 50-443/86-01

REVIEW OF SURVEILLANCE REPORTS (SRs) BY YAEC - FQAG

<u>Surv. Report No.</u>	<u>Test. Proc. Observed</u>	<u>TP Title</u>	<u>Report Date - SR</u>
Y-290	PT(I)-14.2, Rev. 0	EFW System	11-26-85
Y-266	"	"	11-23-85
Y-273	"	"	11-22-85
Y-274	"	"	11-25-85
Y-281	"	"	11-24-85
Y-184	PT(I)-9, Rev. 2	ECC System (HFT)	11-14-85
Y-188	"	"	11-15-85
Y-263	"	"	11-23-85
Y-271	"	"	11-22-85
Y-309	"	"	11-28-85
Y-101	PT(I)-2.2, Rev. 3	Press. Relief Tank	11-09-85
Y-174	"	"	11-14-85
Y-74	PT(I)-1.2, Rev. 0	RC Pump (HFT)	11-07-85
Y-95	"	"	11-08-85
Q2.6.21.9656	PT-16.1, Rev. 1	Primary Comp. Cooling	10-15-85
Q2.6.21.9657	"	"	10-15-85
Q2.6.21.9653	"	"	10-13-85
Q2.6.21.9707	"	"	10-19-85
Q2.6.21.9701	"	"	10-17-85
Q2.6.21.9688	"	"	10-16-85
Q2.6.21.9672	"	"	10-15-85