

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-213/89-15

Docket No. 50-213

License No. DRP-61

Licensee: Connecticut Yankee Atomic Power Company  
P.O. Box 270  
Hartford, Connecticut 06141

Facility Name: Haddam Neck

Inspection At: Corporate Office in Berlin, Connecticut

Inspection Conducted: September 11-15, 1989

Inspector: A. L. Della Greca 10/12/89  
A. L. Della Greca, Reactor Engineer, PSS, EB date

Approved by: C. J. Anderson for 10-12-89  
C. J. Anderson, Chief, Plant Systems Section, date  
EB, DRS

Inspection Summary: Inspection on September 11-15, 1989 (Inspection Report No. 50-213/89-15)

Areas Inspected: Announced inspection by regional personnel to review the status of previously identified open items and to determine the adequacy of the licensee's actions to resolve them.

Results: The inspector determined that the licensee has satisfactorily responded to the previously identified items. No new violations were identified.

## DETAILS

### 1.0 Persons Contacted

#### Northeast Utilities Service Company

- \* P. A. Blasioli, Supervisor Nuclear Licensing
- A. K. Gulesserian, Qualification Engineer
- \* W. E. Hutchins, Licensing - EEQ Coordinator
- \* B. James, Qualification Engineer
- \* M. R. Lombardi, Qualification Engineer
- \* R. S. Peterson, Sr. Qualification Engineer
- \* K. Petschaner, C. Y. Engineering - EEQ Contact
- B. Tuthill, Supervisor Qualification Engineering

\* Denotes personnel present at the exit meeting of September 15, 1989

### 2.0 Purpose

The purpose of the inspection was to review the status of previously identified items and to determine the adequacy of the licensee's corrective actions in resolving each issue.

### 3.0 Status of Previously Identified Items

#### 3.1 (Closed) Violation Item No. 50-213/87-28-02 regarding the improper lubrication of motors associated with 20 safety related Limitorque valve operators.

During the November 1987 EQ inspection the NRC inspector observed four Limitorque valve motors with buckets under the T-drain collecting oil dripping from the motor housing. Discussions with the licensee revealed that 20 environmentally qualified Limitorque valve motors had been improperly lubricated in that the electricians had put grease in the motor housing, instead of the pinion gear housing. The problem had been discovered by the licensee. The source of the problem was primarily attributed to inadequate MOV maintenance procedures, lack of training of the personnel involved and improper supervision. The root cause and the subsequent corrective actions taken by the licensee are addressed in its Licensee Event Report of December 17, 1987 and, again, in its response to the Notice of Violation in the letter of May 6, 1988.

Review of the documentation provided by the licensee shows that:

- a. Preventive Maintenance Procedure No. PMP 9.5-4 was revised to address the specific lubrication concern by means of Temporary Procedure Change Notice No. 88-20 on January 15, 1988.

- b. Procedure PMP.9-4 was formally revised to provide step by step instructions and warnings on May 9, 1989 and again with minor modifications on August 16, 1989.
- c. Personnel training was last conducted in June, 1989.
- d. The licensee conducted a visual inspection of all MOVs to ensure that no other incorrect maintenance had been performed.
- e. The licensee reviewed all Work Orders after July 18, 1987 to ensure that work performed on safety related equipment did not invalidate its environmental qualification.
- f. The improperly lubricated motors were inspected, disassembled, cleaned and tested by the motor manufacturer.

The corrective actions taken by the licensee to resolve the MOV lubrication problem are considered adequate and this item is closed.

3.2 (Closed) Violation Item No. 50-213/87-28-03 relative to the lack of adequate qualification documentation for the Rockbestos cable.

During the November 1987 EQ review, the qualification package for the Rockbestos cable indicated that the licensee based its qualification of the subject cable on a report which was considered invalid by the NRC because of the deficiencies identified in IE Information Notice 84-44.

In response to the NRC finding, the licensee obtained qualification report No. QR 7802, dated Jan. 21, 1988 from the cable manufacturer. Review of this report shows that it adequately addresses qualification of the cable for the Haddam Neck environment and the NRC concerns relating to the lack of a QA program and to the inadequate evaluation of test anomalies.

The licensee's resolution of the finding is acceptable and this item is closed.

3.3 (Closed) Unresolved Item No. 50-213/87-28-04 pertaining to the discrepancies found between SCEW sheet and check list for the Rockbestos cable.

Review of the qualification package for the Rockbestos cable during the November, 1987 inspection revealed that the check list and the SCEW sheet did not agree as to the submergence of the cable. Subsequent discussions with the licensee indicated that the cable would be subject to submergence, as shown on the SCEW sheet, and that the check list would be appropriately revised.

The revised check list shows that the item was corrected. In addition the submergence issue was adequately addressed in an analysis performed by the licensee. This item is considered close.

3.4 (Closed) Violation Item No. 50-213/87-28-05 pertaining to the lack of adequate qualification documentation for the Kerite cable.

The November, 1987 review of environmental qualification package for the Kerite cable revealed that the reports used by the licensee indicated low cable insulation resistance during a LOCA and no testing for submergence.

An evaluation of the revised qualification package revealed the following:

- a. The FR/FR Kerite cable at Haddam Neck is used in control circuits only, is subject to submergence and is qualified by Isomedix Report No. I-R978-02
- b. Qualification Report No. I-R978-02 identifies no anomalies resulting from high leakage current or low insulation resistance. The readings taken by the manufacturer during and following the accident test conditions are acceptable for the intended application.
- c. The HTK/FR Kerite cable used at Haddam Neck has an insulation rating of 1000 V., is used in power applications only, is subject to submergence and is qualified by Franklin Institute Research Laboratories Report No. F-L4020-2.
- d. For the 1000 V. insulation cable, the qualification report in item c. shows acceptable readings for insulation resistance and no failures during the post DBE voltage withstand test.
- e. The Compound K19 (Regular) Kerite cable used at Haddam Neck has an insulation rating of 5000 V., is used in power applications only, is not subject to submergence and is qualified by Wyle Report No. 47-176-1.
- f. The Wyle qualification report shows no anomalies and acceptable leakage current readings during and following the DBE test.
- g. The HT/NS-5KV cable at Haddam Neck is used in power applications, is not subject to submergence and is qualified by Isomedix qualification report No. I-R975-01
- h. The qualification report in item g. shows acceptable leakage current readings and acceptable test results.
- i. Neither the FR/FR nor the HTK/FR cables were subject to submergence during the qualification testing. Submergence is addressed in an analysis performed by the licensee with supporting documentation from the manufacturer.

On the basis of the above this item is considered closed.

- 3.5 (Closed) Unresolved Item No. 50-213/87-28-05 pertaining to the use of out-of-date LOCA profiles with the SCEW sheets for the Limitorque valve actuators and the Marathon 300 terminal blocks used in the actuator.

During the November 1987 inspection, the NRC inspector observed that the SCEW sheets for several Limitorque valve actuators and associated Marathon 300 terminal blocks used a containment peak temperature of 305 degrees Fahrenheit. Comparison of this temperature with the test temperature revealed that the requirement for a 15 degree margin was not met. Subsequent discussions with the licensee showed that the accident profile had been revised and that the new peak temperature was enveloped by the test profile with adequate margin.

Review of the qualification package during the subject inspection showed that the accident profiles had been revised to show the latest data. However, a comparison of these with the test profiles showed an area where no overlap existed. Specifically, the Haddam Neck accident profile exceeds the MOV test profile by a maximum of 30 degrees Fahrenheit for approximately 5 hours (from 3000 to 18000 seconds, approximately) and the terminal blocks test profile by a maximum of 20 degrees for approximately 3 hours (from 4000 to 14000 seconds, approximately). In addition, the lack of overlap had not been addressed, as required by item II.3. of the check list.

Prior to the closure of the inspection, the licensee performed an analysis to address the lack of overlap and added it to the qualification package which was revised in accordance with its current procedure.

The analysis adequately justifies qualification for the period and the item is considered closed.

- 3.6 (Closed) Unresolved Item No. 50-213/87-28-09 regarding the use of DBE testing to calculate the post accident operability period of the Asco solenoid valves.

The November 1987 review of the qualification package for the Asco solenoid valve revealed that the DBE simulation and the post accident operability time simulation were treated together in the Arrhenius calculation analysis and compared with the required DBE and post accident operability time to demonstrate qualification for the post accident period.

In response to the NRC concerns about the impropriety of the method used, the licensee performed an additional analysis to show qualification. The analysis was found acceptable pending further review by the inspector.

Review of the qualification package during the subject inspection shows that the licensee reevaluated the required post accident operability period and found it to be a maximum of 30 hours and, hence, well within the post accident simulation of 32 days. This item is closed.

- 3.7 (Closed) Unresolved Item No. 50-213/87-28-10 pertaining to the licensee's response to IE Information Notice 84-23 and qualification of Asco solenoid valves Model NP-8316.

During the November 1987 review of the qualification file for the Asco solenoid valve, the NRC inspector determined that the licensee had justified qualification of solenoid valve Model NP-8316 on the basis of Asco Report AQR-67368, which was the subject of IE Information Notice 84-23. The licensee's position was based on the fact that Asco "feels" that the aging sequence used in the failed NRC sponsored test and discussed in the IE Notice was not indicative of the true aging process. In addition, the licensee had established that the DBE simulation test used in the NRC test was significantly higher than the required temperature profile for the Haddam Neck plant. Since the inspector did not consider the licensee's explanation as sufficient justification for not using Isomedix' test report AQS-2167R/TR-Rev. A, suggested by the information notice, the licensee evaluated the results of the Isomedix test and committed to investigate the possibility of obtaining revised certificate of compliance from the manufacturer.

Review of the revised qualification file shows that the qualification of the Asco solenoid valve is based on the Isomedix test report and that the use of such report was approved by Asco. This item is considered closed.

- 3.8 (Closed) Violation Item No. 50-213/87-28-11 regarding the lack of similarity analysis between the the installed and tested Valcor solenoid valve.

In reviewing the qualification package of the Valcor solenoid valve, the NRC inspector noticed that the model installed at Haddam Neck (V526-6042-17) was not in the list of models addressed by Valcor qualification report No. QR526-5683-6. During the course of the November 1987 inspection, the licensee obtained a letter from the manufacturer which certified the applicability of the report to the model installed at Haddam Neck.

The Valcor qualification package was revised to include this letter, therefore, the item is considered closed.

- 3.9 (Closed) Unresolved Item No. 50-213/87-28-12 relating to the service temperature and qualified life of the Weed RTD.

In reviewing the qualification package of the Weed RTD, the inspector observed that the temperature for aging evaluation and DBE simulation appeared to be based on the ambient temperature only and did not consider temperature rise due to self heat and heat conduction from the process medium. In response to the NRC concern, during the November, 1987 inspection, the licensee provided Weed Report No. N9004-87-A. This report showed, by test, that 15 degrees Fahrenheit was a conservative boundary for the temperature rise. In addition, the licensee showed, by calculation, that the qualified life and the post accident operability period of the RTD, using the 15 degree temperature rise, would exceed the specification requirements for 40 years and 1 year, respectively.

Review of the RTD qualification package during the subject inspection showed that the calculations and associated documentation had been revised to address the required 15 degree temperature rise. Therefore, this item is considered closed.

3.10 (Closed) Unresolved Item No. 50-213/87-28-13 pertaining to the inadequate qualification documentation of the Gems DeLaval level transmitter.

While reviewing the qualification documentation of the Gems DeLaval level transmitter the inspector noticed that the submergence test performed by WYLE lasted 30 minutes and that the qualification documents did not address the required submergence time. Further discussions with the licensee revealed the only portion of the transmitter which was potentially sensitive to submergence was the junction box and that this was located above flood level. At the time of the November 1987 inspection, the licensee committed to revise the qualification file to document the installed configuration and to clarify that the junction box was not subjected to submergence.

Evaluation of the Gems DeLaval qualification file shows that the licensee had revised the applicable documents to correct the discrepancy. This item is closed.

While reviewing the licensee's corrective actions for the closure of the subject unresolved item, the inspector observed that the temperature profile used in the Gems DeLaval test did not envelop the required DBE profile for a period of approximately 5 hours (from 7200 to 25000 seconds, approximately) and a maximum of 55 degrees Fahrenheit. In addition, the check list did not address the apparent discrepancy. Prior to the closing of the inspection, the licensee prepared an analysis to justify qualification of the instrument for the post accident period and revised the qualification package in accordance with its current procedure.

The analysis prepared by the licensee is acceptable and this issue also is considered closed.

3.11 (Closed) Violation Item No. 50-213/87-28-14 relative to the lack of qualification data for the Bishop tape splice.

During the November 1987 audit, the NRC inspector determined that the licensee had based the qualification of the W-963 Bishop tape splices used at Haddam Neck upon test data for a W-942 tape and upon the qualification testing of Okonite T-95 tape. However, neither did the qualification file address the similarity between the Bishop W-963 tape and the other splice components nor did it contain data to show that the splice configuration had been tested for use in harsh environments. In response to the inspector concern, the licensee indicated that the W-963 tape was being analyzed for its similarity to the other two tapes.

Review of the revised package shows that a comprehensive material's analysis was performed by the Institute of Materials Science at the University of Connecticut. Although the analysis identified several differences between the three EPR tapes it concluded that the W-963 tape would perform equally well or better than the other two tapes.

Since the Bishop tape splices were performed using the qualified Okonite splice procedure and similarity between the Bishop and the Okonite tapes was established by the University of Connecticut tests, this item is closed.

3.12 (Closed) Violation Item No. 50-213/87-28-15 pertaining to the licensee's identification of six pieces of cable with unknown qualification status.

During the week of November 9, 1987, while the plant was in a refueling outage, the licensee identified 6 pieces of cable, the qualification status of which was unknown. These cables were later identified to be Anaconda Continental SIS 14AWG HLPE insulated cables. However, at the time of the November 1987 inspection, no qualification file existed nor was the Anaconda cable included in the EQ master list. Although the licensee's evaluation showed that the finding did not constitute a safety concern, the licensee decided to replace the cables with equivalent qualified ones.

Review of Work order Nos. CY 87 11109, CY 87 11909, and CY 87 11905 (and related documents) shows that the cables were replaced with qualified Brand-Rex XLP/CU No. 14AWG SIS cables. Therefore, this item is closed.

3.13 (Closed) Violation Item No. 50-213/87-28-17 regarding the lack of qualification documentation for a Raychem splice configuration found in Namco limit switches.

During the November 1987 EQ inspection of the Namco limit switches associated with PORV ADV-568, the NRC inspector discovered Raychem splices which did not meet the two inch splice seal length because the overall length was much shorter than those qualified by the Raychem test (2" and 1-3/4" versus 6"). In response to this finding, the licensee cited a recent test performed by Wyle in which short splices with as little as 1/2 inch seal length had been successfully qualified for DBE conditions enveloping those at Haddam Neck.

The revised qualification package and the analysis by the licensee show that qualification of the Raychem splices found in the Namco limit switches is supported by the Wyle test report No. 17859-02P, dated 3/11/87. The report is part of the revised qualification file.

This item is considered closed.



#### 4.0 Plant Walkdown

The plant physical inspection consisted of an examination of the outboard Main Steam Isolation Valves and of other safety related electrical equipment located in the PAB, the only areas which were available for inspection. Components reviewed included solenoid operated valve, motor operated valves, pumps, motor control centers, and terminations.

No violations were observed during this inspection.

#### 5.0 Exit Meeting

The inspectors met with the licensee's personnel denoted in paragraph 1.0 of this report at the conclusion of the inspection period on August 25, 1989. At that time, the scope of the inspection and the inspection's results were summarized. At no time during the inspection was written material given to the licensee.