

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-443/89-14
Docket No. 50-443
License No. NPF-56
Licensee: Public Service of New Hampshire
P. O. Box 330
Manchester, New Hampshire 03105

Facility Name: Seabrook

Inspection At: Seabrook, New Hampshire

Inspection Conducted: October 16-20, 1989

Inspector: *A. L. Della Greca*
A. L. Della Greca, Reactor Engineer, PSS, EB, DRS

11/6/89
date

Approved by: *C. J. Anderson*
C. J. Anderson, Chief, Plant Systems Section,
EB, DRS

11/6/89
date

Inspection Summary: Routine Safety Inspection on October 16-20, 1989
(Inspection Report No. 050-443/89-14)

Areas Inspected: Announced inspection by regional inspector 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 four open items relating to the environmental qualification of Raychem splices. Within the scope of this inspection, no violations were observed.

DETAILS

1.0 Persons Contacted

1.1 New Hampshire Yankee

- * A. Ambrose, Technical Instructor
- * R. Bergeron, Engineering Programs Manager
- * S. P. Buchwald, Quality Assurance Supervisor
- * H. Carpenter, Sr. Electrical Inst.
- * R. E. Cyr, Maintenance Manager
- * W. A. DiProfio, Assistant Station Manager
- W. F. Monteith, Nuclear Quality
- * T. F. Murphy, ICCS
- * V. J. Pascucci, Q.C. Inspection Supervisor
- * D. W. Perkins, Licensing Engineer
- * E. J. Sowersky, T. P. Supervisor
- * W. J. Temple, NRC Coordinator
- * P. J. Tutinas, Engineering Programs Supervisor
- T. P. Vassallo, Jr., Quality Assurance Engineer
- * C. J. Vincent, Q.C. Department Supervisor
- * J. Warnock, Nuclear Quality Manager
- W. Yingling, Technical Support Engineer

1.2 U. S. Nuclear Regulatory Commission

- * S. T. Barr, Reactor Engineer
- * A Cerne, Senior Resident Inspector

* Denotes personnel present at the exit meeting.

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) Unresolver: Item No. 50-443/86-47-01 pertaining to the use of potentially unqualified Raychem splice configurations.

During a routine inspection in October 1986, the inspector witnessed work performed on Raychem heat shrinkable tubing which was being performed to ensure that the electrical terminations used properly sized shims and sleeves. Discussions with the licensee revealed that the licensee was in the process of performing an analysis to justify qualification of splices with bending radii smaller than those recommended by the manufacturer. Potentially unqualified configurations of Raychem splices were again a topic of discussion during inspections performed during the period March-May, 1987 (NRC Report No. 50-443/87-10).

As result of Information Notice 86-53, the licensee undertook a reinspection program. This program eventually developed into a complete review of all plant splices. During original sampling, the licensee determined that not all plant installations conformed to the configurations qualified by the splice manufacturer. The deviations were categorized into eight groups. These included: short seal length, small bending radius, missing or short shim, and incorrectly sized shim or sleeve.

In order to qualify the deviations found, the licensee obtained two reports which describe qualification tests conducted by Wyle Laboratories for Commonwealth Edison Company. Using the results of the Wyle tests, the licensee was able to qualify most of the configurations found. Those configurations which could not be qualified were replaced with qualified splice configurations. The same process was used to justify qualification of all other variations found as a result of the complete reinspection program conducted.

The original analysis as well as the supplemental analyses performed to address the deviations found later are included in the licensee's Design Change Request Package No. 87-0137. Except as noted in the following paragraph, the licensee's analyses and current program for installing new Raychem heat shrinkable tubing are considered adequate for qualification of the electrical terminations. This item is closed.

3.2 (Closed) Unresolved Item No. 50-443/89-04-01 regarding the improper application of in-line Raychem splices.

In March 1986, as result of Information Notice 86-53, the NRC reviewed the licensee's program for inspecting and ensuring qualification of electrical terminations using Raychem heat shrinkable tubing. Evaluation of the licensee's Raychem splice installation procedure, No. MS0514.09, revealed that it allowed the use of heat shrinkable tubing in control and power circuits where more than two wires are part of an in-line splice.

In response to the inspector's concern regarding the qualification status of these installations, the licensee performed an analysis and justified qualification of the configuration on the basis of tests conducted by Wyle Laboratories on less conservative configurations. Review of this analysis indicates that the configuration in question is qualifiable, if supported by an appropriate installation procedure and additional testing.

Subsequent to the finding, in spite of the conclusions of its analysis, the licensee decided to replace all the splices of concern with qualified Raychem break-out type splices. In addition, it revised its procedure MS0514.09 to make mandatory the use of these in all future similar installations.

At the time of the current inspection the replacement of the questionable splices was nearly 100% complete, with the remainder scheduled for replacement by approximately the end of November, 1989. Based on the above, this item is closed.

3.3 (Closed) Unresolved Item 50-443/89-04-02 relative to the use of Raychem heat shrinkable tubing over braided wire insulation.

During a previous inspection of the Raychem installations, the NRC inspector observed several splices which appeared to use heat shrinkable tubing directly over braided insulation, contrary to the manufacturer's recommendations. At the time of the inspection the licensee assured the inspector that the braids had been cut back and that they had been tucked under the shrinkable tubing only enough to prevent their fraying. However, the licensee was unable to provide a procedure or other document to show that that was indeed the practice during the construction period.

During the current inspection the licensee provided a trail of documents which led to the use of an appropriate Raychem installation procedure for each type of kit or shrinkable tubing. The licensee's claim was further proven by two randomly selected splices which were opened and found to have cut-back braiding material. The cutting of the splices was performed in the presence of the NRC inspector.

In view of the documents provided and the results of the physical inspection, this item is closed.

While witnessing the post-modification testing of the pressurizer power operated relief valves, the NRC resident inspector became aware that the QC organization had an outstanding concern regarding the installation of two new Raychem splices (NRC Report No. 50-443/89-05). This prompted the NRC inspector to question the licensee's Quality Control Department's present policy of inspecting only approximately 80% of these installations.

In response to the NRC's concern the licensee's Quality Control Department submitted evidence that, based upon its Trend Analysis Data Base, the current workmanship problem rate was approximately two percent. The inspector concluded that the present policy of the licensee's Quality Control Department is acceptable and the issue is closed.

3.4 (Closed) Unresolved Item No. 50-443/89-04-03 pertaining to the use of short shims in Raychem splices.

During the March, 1989 physical inspection, the NRC inspector observed a 3-wire splice which appeared to contain shims shorter than the required two inches. The splice was also inspected by the licensee who agreed that, on the basis of its procedure requirements, it should have been replaced.

Following the inspection, the licensee took the necessary steps to replace the splice, which was cut in the presence of the NRC resident inspector and sent to the regional inspector for evaluation. Review of the cut splice revealed that the shims were longer than the required two inches and that the shrinkable tubing had been used in conjunction with a qualified break-out type splice. The confusion was the result of the atypical overlapping of the shim by the break-out kit.

Since that was the only splice found by the inspector that appeared to contain short shims and since all the in-line splices containing more than two wires were or will be replaced by the licensee, this item is closed.

4.0 Physical Inspection

A walkdown of the plant was conducted to verify the installation of the several Raychem splices which had been previously identified by the licensee as not meeting its qualification requirements and, hence, requiring replacement. Review of the new installations identified no violations.

5.0 Exit Meeting

The inspector met with the licensee's personnel denoted in paragraph 1.0 of this report at the conclusion of the inspection period on October 20, 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.