

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-244/89-24
Docket No. 50-244
License No. DRP-18
Licensee: Rochester Gas and Electric Corporation
49 East Avenue
Rochester, New York 14649

Facility Name: Genoa Station

Inspection At: Rochester, New York

Inspection Conducted: September 25-29, 1989

Inspector: *A. L. Della Greca* 10/30/89
A. L. Della Greca, Reactor Engineer, PSS, EB date
Approved by: *C. J. Anderson* 11/1/89
C. J. Anderson, Chief, Plant Systems Section, date
EB, DRS

Inspection Summary: Inspection on September 25-29, 1989
(Inspection Report No. 50-244/89-24)

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 these items.

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



DETAILS

1.0 Persons Contacted

Rochester Gas and Electric Corporation

R. W. Arnod, Special Projects Engineer
N. J. Love, Electrical Engineer
G. Wrobel, Manager, Nuclear Safety & Licensing

The above personnel were present at the exit meeting of September 29, 1989.

2.0 Purpose

The purpose of the inspection was to review the status of previously identified environmental equipment qualification (EEQ) open 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) Unresolved Item No. 50-244/87-03-01 regarding the generic equipment qualification file deficiencies identified.

While reviewing the equipment qualification files, during the February 1987 inspection, the NRC team observed several deficiencies which generally affected the documentation packages reviewed. Specifically, the inspectors noted that the files:

- a. lacked performance and acceptance data;
- b. had no positive indication that they had been reviewed;
- c. provided no assurance that a plant walkdown had been performed to verify the completeness of the file;
- d. included references which were too general to allow verification of supporting data;
- e. contained no data to support evaluation and disposition of Information Notices;
- f. lacked a positive statement relative to the qualification of the equipment;
- g. identified only generically the applicable plant equipment.

In response to the inspectors' observations, the licensee performed various corrective actions to address the NRC concerns. Corrective actions included:

- a. reevaluation of the instrumentation's performance requirements and capabilities (Integrated System performance Analysis);
- b. revision of the EEQ form to identify equipment by plant identification number, to include a statement relative to the basis for qualification and to provide less generic references;
- c. implementation of as-built flow/loop diagrams to show all class 1E equipment from sensor to end device;



- d. initiation of a 10 CFR 50.49 Applicability Review program to address Information Notices and Bulletins;
- e. revision of administrative procedure No. 10 and engineering procedure No. QE328.

In addition, the licensee is evaluating the need for a formal equipment qualification checklist.

The inspector reviewed the licensee's corrective actions associated with each of the above items along with several EQ files to evaluate the effectiveness of the corrective actions. In view of the licensee's corrective actions described above and the inspector's review of the corrective actions, this item is closed.

3.2 (Closed) Violation Item No. 50-244/87-03-02 pertaining to the inadequate qualification documentation for Crouse-Hinds electrical penetrations.

Evaluation of the qualification package for Crouse-Hinds electrical penetrations during the team inspection of February, 1987 revealed that the file did not contain an analysis to show similarity between the installed and the qualified penetrations. The lack of similarity analysis was determined to be a violation of 10 CFR 50.49, paragraphs (f) and (k). 10CFR50.49 (f) requires that qualification of each item of electrical equipment be based on testing or experience with identical equipment or similar equipment with supporting analysis to show that the equipment is acceptable. 10CFR50.49 (k) states, in part, that electrical equipment need not be requalified if it was previously required by the Commission to be qualified in accordance with the DOR Guidelines. However, Section 5.2.2 of the DOR Guidelines states, in part, that type test is only valid for equipment identical in design and material construction to the test specimen and that any deviations should be evaluated.

In response to the Notice of Violation, the licensee contended that "As explicitly described in RG&E's March 6, 1987 letter..., the qualification information available in the... files at the time of the inspection provided reasonable assurance that the Crouse-Hinds electrical penetrations... were fully environmentally qualified..." and that "... all of the materials of construction were shown to be equal to or better than the materials which were tested..."

Evaluation of the referenced March 6, 1987 letter and of the EQ package involved indicates that much of the data necessary to perform the required similarity analysis was available to the licensee. However, no such analysis had been performed to address physical and material differences between installed and tested equipment, critical characteristics of the installed materials, and capabilities of these to perform the intended safety function. In addition, the March 6, 1987 letter was not, in itself, an analysis and some of the data provided therein was not supported by documented evidence. In view of the above, the violation is justified and stands as stated.



During the course of the subject inspection the licensee prepared a formal similarity analysis addressing the items of concern. The inspector reviewed the above similarity analysis. No deficiencies were identified. This item is closed.

3.3 (Closed) Violation Item No. 50-244/87-03-03 relative to the lack of similarity analysis for the General Cable Corporation PVC cable.

While reviewing the qualification package for the PVC cable used at Ginna (General Cable Corporation), the inspector observed that for its qualification the licensee primarily relied on a generic test performed by Wyle Laboratories on a cable identified only as CP&L PVC cable. The Ginna cable was stated to be similar to the CP&L cable but no similarity analysis was available in the package. In addition, the package lacked specific performance/acceptance criteria. The lack of similarity analysis was determined to be a violation of 10 CFR 50.49, paragraphs (f) and (k) whose requirements are stated in section 3.2 of this report. Discussion with the licensee revealed that the Ginna cable was undergoing qualification testing and that preliminary results were positive.

In its response to the Notice of Violation, the licensee disagreed with the finding making reference to its letter of March 6, 1987 to the NRC. This letter justified qualification on the basis of an internal memorandum, dated March 16, 1986, which compared "the electrical and physical applications and dimensions, and the anticipated harsh environment, of the PVC cables tested... to those installed at Ginna." The same letter acknowledged the fact that the memorandum had not addressed material differences, but it considered these to be minimal in comparison to the RG&E needs. The inspector noted that additives and plasticizers do change the characteristics of a material. Therefore, the similarity between the tested and installed cables could not be assumed or implied and the licensee's memorandum could not be considered adequate for qualification. Based on the above the violation assessed is justified.

Following the inspection, the licensee submitted a formal similarity analysis. In addition, as previously stated, the licensee conducted environmental qualification testing of the installed cable. Both documents were added to the qualification package. The inspector reviewed the similarity analysis and the cable qualification test reports. No deficiencies were identified. The inspector concluded that the similarity analysis performed by the licensee and the results of the qualification testing of the cable established the cable qualification. This item is closed.

3.4 (Closed) Violation Item No. 50-244/87-03-04 pertaining to the inadequate qualification documentation for the Coleman cable.

During the Equipment Qualification (EQ) inspection of February 1987 the NRC inspector determined that qualification of the Coleman cable



used at the Ginna plant was based upon tests of seven cables performed by Franklin Research Center. However, none of the seven cables tested was identified to be manufactured by Coleman. In addition, the inspector observed that insulation resistance measurements were not taken during the qualification testing. Based on the above the the inspector concluded that the licensee had not adequately demonstrated qualification of the Coleman cable and that the lack of analysis constituted a violation of 10 CFR 50.49, paragraph (f), the requirements of which are identified in section 3.2, above.

Responding to the Notice of Violation, in its letter of July 9, 1987 the licensee disagreed with the finding stating that it considered that the testing and materials analysis in package #13 provided reasonable assurance that the cable would be able to perform its required function. In addressing the inspector's concern regarding the lack of insulation resistance measurements during the LOCA, in its letter of March 6, 1987, the licensee identified various measurements taken at different stages of the test. However, none of these were taken during the LOCA testing, when high humidity and high temperature combine to greatly decrease the insulation resistance of electrical devices. Insulation resistance is critical in instrument loops and cannot be deduced from measurements taken after the event at room temperature and low humidity conditions. Since the documentation package did not contain adequate bases for qualification, the violation assessed is justified and stands as stated.

Qualification of the Coleman cable was independently addressed by the licensee in a test. Review of the results of this test adequately justify qualification of the cable for the intended application. Therefore this item is closed.

3.5 (Closed) Violation Item No. 50-244/87-03-05 pertaining to the inadequate qualification documentation of the Victoreen High Range Radiation Monitor.

In reviewing the qualification package for the Victoreen High Range Radiation Monitor, the inspector observed that the installed configuration of the cable/connector assembly at Ginna was different from those tested and qualified by the manufacturer. The package did contain an analysis to address the difference in installation. However, the Raychem heat shrinkable tubings used to seal moisture out of the connector cavity and termination points did not totally envelop the cable/connector assembly leaving at least one path for moisture intrusion at the connector interface at the bottom of the instrument. On this basis, the inspector concluded that the licensee had not adequately demonstrated the qualification of cable/connector assembly and detector interface. The finding constitutes a violation of 10CFR50.49, paragraph (f), the requirement of which were previously identified.



To address the NRC concern the licensee provided additional sealing, consisting of RTV 7403, in the exposed region between the bottom of the detector and the Raychem sleeves. However, in its response to the Notice of Violation the licensee disagreed with the finding stating that it had already addressed "all of the leakage path failure mechanisms determined in the Victoreen Qualification Test Report 950.301." The licensee based its argument on the fact that "the final Victoreen assembly which passed the LOCA test did not provide a seal at the interface being questioned..., Page VI-45, Photograph VI-24."

During the current inspection, further review of the Victoreen's qualification package and references provided by the licensee revealed that the final cable/connector assembly qualified by Victoreen was successfully tested after the equipment had been shipped to Ginna. Therefore, the potting resin and nickel seal, which were added to the threaded area in question for the tested assembly; could not be part of the assembly furnished to Ginna. A review of applicable documentation performed by the licensee could not establish that the assembly installed at Ginna had been either modified by the manufacturer or by the licensee. Therefore, the violation imposed is justified and no basis exists for its withdrawal.

Since the RTV sealing of the area was successfully tested by Wyle Laboratories for the Indian Point 2 Nuclear Power Plant and the use of Raychem heat shrinkable tubing was effectively used in a General Atomic test of a similar assembly, it is concluded that the Victoreen cable/connector assembly, as it currently exists at the Ginna Station, adequately meets the sealing requirements for maintaining environmental qualification of the Victoreen High Range Radiation Monitor. Therefore, this item is closed.

3.6 (Closed) Violation Item No.50-244/87-03-06 pertaining to the inadequate qualification documentation for specific configurations of Raychem splices.

During the February 1987 plant walkdown, the NRC inspector observed several Raychem splices which did not meet the two inch seal overlap and the 5 x O.D. minimum bending radius requirements to maintain qualification. The lack of adequate qualification documentation for the configurations found constituted a violation of 10 CFR 50.49, paragraph (f) the requirements of which were previously addressed. Discussions at the time of the inspection revealed that the licensee was in the process of performing qualification testing of the potentially unqualified splice configurations.

In response to the Notice of Violation, the licensee disagreed with the finding stating that the Raychem bend radius and the overlap were believed to be recommendations, not requirements. The position of the licensee is further addressed in their letter of March 6, 1987 to the NRC. In this letter they state that FRC Report No. F-C5074,



which was part of the Raychem splice qualification package, had tested various splice configurations, including one with $\frac{1}{2}$ inch overlap. These splices were reported to perform acceptably. However, the report did not contain sufficient information to establish qualification of the $\frac{1}{2}$ inch overlap splice. Therefore, the only qualification upon which the licensee could rely was that of Raychem which specifically requires a minimum overlap of two inches, the basis for Raychem's qualification testing. With respect to the minimum bending radius, Raychem's memorandum of October 26, 1986 to the holders of Raychem Nuclear, Products-Guide I clearly states the basis for the requirement imposed. This memorandum also places the burden of analysis and additional testing for any deviation on the user. Therefore, the violation is justified and no basis for its withdrawal exists.

Review of the revised documentation package which includes the results from the Wyle test shows that the configurations discussed above are now qualified for the intended application. This item is closed.

4.0 Physical Inspection of Electrical Equipment

The plant walkdown was limited to safety related equipment located outside the reactor containment. Items examined included motors, Limitorque motor operated valves, solenoid operated valves, transmitters, electrical penetrations and cable splices. No violation were observed during this inspection.

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 on September 29, 1989. At that time the scope of the inspection and the results were summarized. At no time during the inspection was written material given to the licensee.

