

- b. Violation 50-416/87-32-02, Limitorque MOV, T Drains and Grease Relief, Paragraph 13.c.(2).
- c. Violation 50-416/87-32-03, Raychem Heat Shrink Tubing in Unqualified Configuration, Paragraph 13.c.(4) and 13.c.(10).
- d. Violation 50-416/87-32-04, Qualification Package for Lubricants, Paragraph 13.c.(1).
- e. Unresolved Item 50-416/87-32-05, Nylon Wire Crimped Connectors on Limitorque Dual Voltage Motors, Paragraph 13.c.(2).
- f. Unresolved Item 50-416/87-32-06, Accuracy Calculations for PAM Instruments for Postulated Harsh Environments, Paragraph 13.c.(7).
- g. Unresolved Item 50-416/87-32-07, Summary Test Reports for Terminal Blocks to Category 1 Requirements to be Upgraded, Paragraph 13.c.(8).
- h. Unresolved Item 50-416/87-32-08, Seal Assembly for Victoreen Radiation Monitor Connectors, Paragraph 13.c.(11).

The licensee did identify some material as proprietary during this inspection, but this material is not included in this inspection report.

3. Licensee Action on Previous Enforcement Matters

NRC's Unresolved Items 50-416/86-39-04 concerning wiring in Bettis and Hiller actuators and 50-416/86-37-02 concerning Raychem splices are closed with this report. These items are discussed in Paragraphs 13.c.(5) and 13.c.(10), respectively.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. Four unresolved items identified during this inspection are discussed in paragraphs 13.c.(2), 13.c.(7), 13.c.(8) and 13.c.(11).

5. Electrical Equipment Environmental Qualification Program and Procedure Review

The inspectors reviewed SERI/Grand Gulf EQ Program directives to verify establishment of an EQ Program in compliance with 10 CFR 50.49 including the following:

- Engineering Standard (ES) 21, Environmental Qualification Program.

Material Nonconformance Report (MNCR) No. 454-87 was written on December 7, 1987, to document the procurement and installation of commercial grade replacement parts in EQ equipment. The scope of the problem appears to be limited. This is based on the inspector's review of the disposition of the MNCR by NPE of the various equipment types and systems involved. It was determined that the root cause was poor personnel-procedural interface within the Material Specialist group in that, (1) the procurement procedures were deficient and (2) the staff were inadequately trained in the requirements of the EQ program. This situation was made worse by a deficient dedication process for commercially procured replacement parts which did not require an engineering review by NPE. The use of commercial grade material in EQ application is a design change and is subject to design control measures delineated in ANSI N45.2.11-1974. In response to the inspector's question concerning corrective actions taken to assure the continued EQ status of installed equipment, licensee management stated: O-Rings for ASCO Kit #302-9296E (stock code GG 86164006) and Solenoids for ASCO Kit #8321AGE (stock code GG 85336008) were determined to be dispositioned as "Rework". Qualified replacement parts have been ordered, and Maintenance Work Orders (MWOs) have been prepared for their installation. Upon receipt of the ordered parts the MWOs will be implemented and the removed components will be forwarded to NPE for examination and if necessary destructive tests. Additionally, items in the warehouse associated with stock codes GG 86164006, GG 85336008, and GG 81106090 i.e. ASCO Solenoid Valve #29701-5 have been dispositioned as "Reject", and will be scrapped to prevent recurrence of installation.

At the time of the inspection, the environmental qualification status of equipment having spare or replacement parts associated with the above stock codes was indeterminate. The above material nonconformance is, therefore, classified as a licensee identified violation, in that commercially procured spares and replacement parts were installed in EQ equipment without an adequate dedication process. This is identified as Violation 50-416/87-32-01, Use of and Failure to Evaluate Commercial Grade Parts for EQ Applications.

13. Environmental Qualification Documentation Packages and In-Plant Physical Inspection
 - a. Environmental Qualification Documentation Packages (EQDP)

System Energy Resources's EQDP are prepared and controlled by the Nuclear Plant Engineering Department. The packages included an Equipment Evaluation Checklist, Aging and Radiation Calculation/Analysis, Environmental Parameters, Test Reports, NRC IENs and IEBs reconciliations, Vendor Notifications etc.

An EQDP is prepared for each specific type of qualified component designated by manufacturer and model that are exposed to the same environmental service conditions.

Prior to the NRC inspection team's arrival, walkdowns were being performed by the licensee on various components identified by previous inspections. The splices on the hydrogen recombiner were characterized by the licensee as "cosmetically" unacceptable and work requests had been initiated to replace the existing splices because of their appearance. The NRC inspector determined that the effects of spray and high humidity was not adequately evaluated. The licensee stated that there was no sealing requirement for the splices in that the splices were located in an enclosure. The inspector determined that the enclosure was not moisture proof. At the exit, the licensee stated that the splices would be replaced with qualified Raychem kits. This replacement was completed under MWO-E76966 and MWO-E76967 by December 31, 1987. This is identified as an example of Violation 50-416/87-32-03, Raychem Heat Shrink Tubing Installed in Unqualified Configuration.

- (5) Bettis & Hiller Actuators - The inspector reviewed licensee activities with regard to a previously reported problem concerning the potential use of unqualified wiring with Bettis and Hiller actuators on air operated valves (AOV's). This was identified in NRC Report No. 50-416/86-39 as Unresolved Item 50-416/86-39-04. As a result of IEN 86-53, which was received by the licensee in July 1986, the licensee decided to initiate a comprehensive review of their Raychem splices at their earliest available opportunity, which occurred during their first refueling outage in September 1986. During the course of their inspection, the licensee identified 19 out of 99 valves that contained unidentified wiring. The installation of this wire was traced to a construction/maintenance activity in 1982. At the time this wire was installed, GGNs' construction standards, purchase and procurement specifications required class IE wire to be used in class IE applications. The unidentified wiring was immediately replaced with known qualified and traceable wiring. The wiring which was removed was categorized into eight different wire types. A representative sample of each of the wire types was sent off to a materials analysis firm to identify the specific insulation materials used. Once the specific materials were identified the licensee performed an analysis, documented in calculation EC-Q111-87001, RO which demonstrates the wiring had sufficient thermal and radiation withstand capability to perform its function. Based on this calculation, the inspector concluded that the wiring was qualifiable for its intended application. The licensee also stated that none of the 19 valves were in the ECCS System and that all these valves would have performed their safety (isolation) function within a minute of the postulated harsh environment accident. Because this item was licensee identified, would fit in the Severity Level IV category, had prompt corrective action taken and could not have been reasonably expected to have been prevented by any licensee's corrective action for a previous violation, no citation will be issued in accordance with the guidelines of 10 CFR 2 Appendix C, Paragraph V.A. This Unresolved Item is closed.

IEN 86-53, Improper Installation of Heat Shrinkable Tubing, dated June 26, 1986, was received at the utility in the early part of July. The first opportunity for inspection after receipt of this IEN, was the refueling outage of September 5, 1986 to January 1987. At this time, the licensee performed a routine walkdown inside containment for 10 CFR 50.49 equipment and the IEN concerns. As a result, some non-standard raychem heat shrink tubing installations were identified. The licensee determined from their records that these non-standard installations were not covered by existing GGNS test reports. Being in an outage, the licensee replaced all non-standard configurations as a conservative measure to insure that this item would not impact restart.

The licensee stated that they performed additional analysis and obtained additional test data to show that the non-standard Raychem configuration would have remained operable in the event of a DBA. (See DORI's Letter AECM-87/0045 of March 20, 1987 to the NRC.) This unresolved item is closed and up-graded to a violation identified as an example of 50-416/87-32-03, Raychem Heat Shrink Tubing Installed in Unqualified Configurations.

- (11) EQDP 14.1, Victoreen Radiation Monitor - The file for the Victoreen radiation monitors for high-range containment monitoring was reviewed. The qualification basis was NUREG-0588, Category I. The test conditions enveloped the plant profile and the accuracy of detector was properly addressed and is discussed in paragraph 13.c.(7) above. The test specimen was identical to the plant installed item except for installation.

This component was tested by Victoreen in a number of configurations. After eight unsuccessful attempts, the cable, and connector were sealed in stainless steel conduit from the detector to the LOCA chamber penetration. This was the only configuration that passed the LOCA test. The test report stated that the intention was to seal the connector, but that the proximity to the penetration made it convenient to seal up the cable as well. At GGNS, the connector assemblies are contained in a stainless steel (SS) box, connected to the detector housing with sealed high pressure metal bellows flex conduit, and sealed at the cable entrance points. During the walkdown inspection, the NRC inspector requested that the access cover on the SS box be removed in order to examine the splices. The GGNS technician had no trouble loosening the approximately 7-inch diameter cover cap and screwing it off of the 6-inch diameter threaded collar on the front of the junction box. It was clear that the cap had been only hand tight and also there was no gasket, or O-ring or other apparent sealing device for the heavy, machined stainless steel cap.