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May 16, 1988

U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Document Control Desk

Gentlemen:

SUBJECT: Grand Gulf Nuclear Station  
Unit 1  
Docket No. 50-416  
License No. NPF-29  
NRC Inspection Report  
50-416/87-32; SERI Response  
to NOV on Compliance to  
10 CFR 50.49  
AECM-88/0095

References:

- 1) MAEC-88/0061 dated March 25, 1988; NRC Inspection Report No. 50-416/87-32
- 2) MAEC-88/0068 dated April 1, 1988; Transmittal of Corrected Pages for NRC Inspection Report 50-416/87-32
- 3) AECM-88/0089 dated April 26, 1988; Extension Request on Response to NRC NOV for GGNS EQ program

System Energy Resources, Inc. hereby submits its response to NRC violations 50-416/87-32-01, -02, -03, and -04 regarding the NRC Inspection conducted on December 14-18, 1987 for 10 CFR 50.49 compliance (References 1 and 2). As discussed in Reference 3, SERI requested and was granted extension to file our response until May 16, 1988.

Yours truly,

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Attachment

cc: (See Next Page)

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Notice of Violation 50-416/87-32-01

10 CFR 50 Appendix B, Criterion III, Design Control, requires that measures be established to assure that applicable regulatory requirements and the design basis for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. It also requires that measures be established for the selection and review for suitability of materials, parts, equipment and processes that are essential to the safety-related functions of structures, systems and components. 10 CFR 50.49 paragraphs (f) and (k), respectively requires (1) that each item of electric equipment important to safety must be qualified by one of the methods delineated in this section or, (2) applicants for and holders of operating licenses are not required to requalify electric equipment important to safety in accordance with the provision of this section if the Commission has previously required qualification of that equipment in accordance with NUREG 0588, Interim Staff Position on Environmental Qualification of Safety-Related Electric Equipment.

Contrary to the above, at the time of the inspection, the licensee had installed commercial grade parts on equipment requiring environmental qualification without an adequate evaluation of their suitability for use in safety-related applications. Material Nonconformance Report No. 454-87 dated December 7, 1987, documents the use of the following commercial grade parts in EQ applications: ASCO Solenoid Valve; ASCO Solenoid Kits; and O-Rings for ASCO Kits.

I. Admission or Denial of the Alleged Violation

System Energy Resources, Inc. (SERI) admits to the alleged violation. This violation had no effect on the health and safety of the public.

II. The Reason for the Violation if Admitted

Commercial grade parts without proper dedication were procured and installed on Environmentally Qualified (EQ) equipment because of the following reasons:

1. Materials Technical personnel were not adequately trained in the procurement of parts associated with a specialized application; and
2. Plant procedures did not adequately address the methods to be used by personnel when processing procurement documents for EQ equipment.

During a SERI review of the procurement process prior to the NRC inspection, this nonconformance including other similar components located in the warehouse was identified and documented by Materials Technical personnel in a nonconformance report.

III. The Corrective Steps Which Have Been Taken and the Results Achieved

1. An evaluation was performed by the Materials Technical Group for commercial grade components installed in EQ equipment. Those components identified in the plant as not meeting EQ requirements were replaced prior to restart from the second GGNS refueling outage.

A Material Nonconformance Report (#454-87) was written to document the procurement and installation of unqualified commercial grade components in EQ equipment. Other similarly procured components which were retained in the warehouse were scrapped to avoid future use in EQ applications.

2. Material Section Procedure 12-S-01-15, Procurement Evaluation for Environmentally Qualified Equipment, was developed and issued to provide guidance to Materials Technical personnel when procuring parts for EQ equipment. This procedure also requires an evaluation of commercial grade components by Nuclear Plant Engineering (NPE) for any EQ applications.
3. Members of the Material Technical Group who perform quality level procurement attended training on the requirements of the EQ Program.

IV. The Corrective Steps Which Will Be Taken To Avoid Further Violation

SERI considers that the actions taken in Section III above, are sufficient to preclude further violation.

V. Date When Full Compliance Will Be Achieved

Full compliance has been achieved for Section III.

Notice of Violation 50-416/87-32-02

10 CFR 50.49(f) requires that each item of electric equipment important to safety must be qualified by one of the following methods:

- (1) Testing an identical item of equipment under identical conditions or under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.
- (2) Testing a similar item of equipment with a supporting analysis to show that the equipment to be qualified is acceptable.
- (3) Experience with identical or similar equipment under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.
- (4) Analysis in combination with partial type test data that supports the analytical assumptions and conclusions.

Contrary to the above, the SERI files did not adequately document qualification of several Limitorque valve operators in that the installed plant equipment was not in the same orientation or configuration as the qualified test specimen and deviations were not adequately evaluated as part of the qualification documentation. Specifically, orientation of the actuator on component 1E30F002B was such that the T-drain acted as a high point vent rather than a drain and there were no grease reliefs installed on actuators located inside the drywell.

I. Admission or Denial of the Alleged Violation

System Energy Resources, Inc. (SERI) admits to the alleged violation. This violation had no effect on the health and safety of the public.

II. The Reason for the Violation if Admitted

A. Location of T-Drains due to Orientation of Limitorque Motor

1. Based on information contained in the GGNS Equipment Qualification Documentation Package (EQDP), Limitorque stated in Test Report B0058 that the worst case test configuration was with the limit switch compartment (LSC) oriented in the vertical direction above the actuator. Therefore, SERI concluded that all other LSC orientations were acceptable.
2. Based on Limitorque test reports qualifying GGNS equipment, Limitorque specified the need to install T-drains as a low point drain in the motor housing. However, no GGNS EQDP Limitorque test report specified the need to install T-drains in limit switch compartments.

B. Limatorque Gearbox Grease Reliefs

The GGNS EQDP references Limatorque Test Report 600376A for valve actuators inside drywell. Even though a grease relief was installed on the test actuator, a post test inspection documents that grease extruded into the motor and limit switch compartment. The test actuator cycled during the steam test even with the presence of grease in the motor and on LSC internals. Therefore, grease reliefs were not considered necessary to maintain the Limatorque valves in a qualified configuration.

Based on the above information, SERI had concluded prior to the NRC inspection that the existing qualification documentation was adequate to represent qualification of the subject Limatorque operators as they existed in the field.

III. The Corrective Steps Which Have Been Taken and Results Achieved

A. T-Drains

Material Nonconformance Report (MNCR) 511-87 was written subsequent to the NRC Inspection to evaluate other potential Limatorque operators with LSC orientation that could represent similar qualification concerns. Based on this evaluation 8 Limatorque valves (including the NRC identified valve) required installation of T-drains on the LSC for low point drains.

Prior to startup from the second GGNS refueling outage, T-drains were installed in the limit switch compartments of the 8 identified valves.

B. Grease Reliefs

Thirteen Limatorque valves within the drywell were identified from SERI environmental qualification documentation to require grease reliefs. Prior to start-up from the second GGNS refueling outage grease reliefs were installed in the subject drywell valve actuators.

IV. The Corrective Steps Which Will Be Taken To Avoid Further Violation

To preclude further violation of this nature, the following action will be taken:

The GGNS EQDP for Limatorque valves will be modified to incorporate criterion for T-drains as low point drains (including LSCs) and grease reliefs on the Limatorque valves inside the drywell. This will ensure that future valve installation/modification will be in accordance with this criteria.

V. Date When Full Compliance Will Be Achieved

Full compliance will be achieved for Section IV by June 30, 1988.

Notice of Violation 50-416/87-32-03

10 CFR 50.49(f) states in part that each item of electric equipment important to safety must be qualified by testing of, or experience with, identical or similar equipment, and qualification shall include supporting analysis to show that the equipment to be qualified is acceptable.

Contrary to the above, at the time of the inspection and as far back as November 30, 1985, the Raychem splice on the hydrogen recombiners and other Raychem splices were not in a configuration that was qualified by testing or analysis.

I. Admission or Denial of the Alleged Violation

System Energy Resources, Inc. (SERI) admits to the alleged violation. This violation had no effect on the health and safety of the public.

SERI admits to the NRC violation regarding the examples of Raychem splices identified during the plant inspection at the first GGNS refueling outage. However, SERI believes that the hydrogen recombiner Raychem splices provided the necessary protection to these circuits to maintain environmental qualification. In any case, SERI does not choose to contest the violation. SERI will continue to maintain the hydrogen recombiner splices in accordance with Raychem installation guidelines.

II. The Reason for the Violation if Admitted

A. Raychem Splices Modified at First GGNS Refueling Outage

1. Based on potential industry concerns regarding improper installation of Raychem heat shrinkable tubing through NRC Information Notice 86-53, SERI performed walkdown inspections during the first refueling outage on certain Raychem Splice locations at GGNS for similar installation concerns. As a result, 60 splice locations were identified to have Raychem applications whose installed configurations was potentially unqualified. These splices were reworked in accordance with Raychem established guidelines prior to restart from the first refueling outage. As discussed in SERI correspondence dated March 20, 1987 (AECM-87/0045), further SERI evaluation of the as-found subject splices concluded that the subject circuits would have remained operable.

The as-found conditions in general appeared to represent a failure to follow the Raychem product installation instructions referenced by the SERI sealing standard.

2. The SERI sealing standard (ES-10) provided general overlap and use range guidance but did not include detailed installation guidelines available in Raychem documentation such that the information could be easily used by plant personnel.

3. Training on heat shrink tubing installation to the Raychem standards was also not performed for SERI maintenance personnel prior to this time. This may have allowed a reduced knowledge and sensitivity to the Raychem installation standards by SERI maintenance personnel.

B. Hydrogen Recombiner Raychem Splices

The installation configuration of the hydrogen recombinder splices was based on the sealing requirements dictated by the Westinghouse hydrogen recombinder test report. This report in part established that:

1. The testing conducted on the hydrogen recombinder used a splice that was taped. The taped splice was applied over the glass cloth braid material such that a water tight seal was not achieved. The GGNS configuration which used a Raychem seal kit was subsequently evaluated and found to have effectively provided the required seal based on the flow of adhesive material under the Raychem tubing.
2. The Westinghouse hydrogen recombinder test report only specifies a mechanical protection seal to avoid arcing. Therefore, this splice was never specified by GGNS as an environmental seal requiring a qualified Raychem splice.
3. In addition, during planned testing by Westinghouse, it was demonstrated that the recombinder circuit is protected via a Delta/WYE isolation transformer. The transformer isolates the power feed from ground such that a single short to ground cannot cause failure of the recombinder.

Therefore, based on the above, the installed Raychem seal is concluded to provide equal or better protection of the circuit to that provided by the taped configuration tested and documented in the Westinghouse test report and that GGNS qualification per 10 CFR 50.49 was maintained.

III. The Corrective Steps Which Have Been Taken and the Results Achieved

- A.
  1. As discussed in II.A.1 above, the 60 Raychem splice locations identified during the first refueling outage were reworked per Raychem guidelines prior to restart from that outage.
  2. Prior to reworking the subject splices at the first refueling outage, SERI personnel attended a regional workshop on Raychem tubing applications including recognition of potential installation concerns. This information was subsequently used to support development of a training program for Raychem tubing installation and modification during the subject outage.



3. The GGNS sealing standard (ES-10) was revised to clarify Raychem tubing applications. This revision included the addition of detailed drawings for special tubing applications and improved guidelines for general applications; thereby providing more pertinent information normally contained in Raychem product instructions. Raychem representatives have reviewed and found the SERI guidance acceptable.
  4. The subject plant procedure (07-S-12-109) which is based on ES-10 was also revised to incorporate better Raychem sealing standards and inspection requirements.
- B. Each of the four splices within both hydrogen recombiners were reworked prior to restart from the second refueling outage in accordance with the specified Raychem configuration guidelines.

IV. The Corrective Steps Which Will Be Taken To Avoid Further Violation

To preclude further violation of this nature, the following actions will be taken:

- A. Raychem installation training is now being conducted for specified I&C and Electrical Maintenance personnel who will be installing Raychem tubing. This training includes hands-on experience and provides the trainees with plant relevant configurations.
- B. SERI engineering standard (ES-04) will be modified to require that the hydrogen recombiner terminations are maintained in a manner consistent with plant Raychem tubing installation standards.

V. Date When Full Compliance Will Be Achieved

Full compliance will be achieved for Section IV.A by September 1, 1988 and Section IV.B by June 30, 1988.

Notice of Violation 50-416/87-32-04

10 CFR 50.49(j) requires that a record of qualification be maintained in an auditable form to permit verification that each item of electric equipment important to safety (1) is qualified for its application; and (2) meets its specified performance requirements.

Contrary to the above, at the time of the inspection and as far back as November 30, 1985, there was no documentation in the licensee's files to show the qualification of Mobilux EP-2 grease.

I. Admission or Denial of the Alleged Violation

System Energy Resources, Inc. (SERI) admits to the alleged violation. This violation had no effect on the health and safety of the public.

II. The Reason for the Violation if Admitted

The GGNS EQ program distinguishes between "required" and "recommended" maintenance. Required maintenance are those specific maintenance actions which are necessary to support environmental qualification testing and analysis. Recommended maintenance is only that maintenance recommended by the vendor for normal component servicing but is not considered necessary to assure environmental qualification.

The GGNS EQDP covering fan motors manufactured by Reliance, Inc. included vendor manuals by Joy (fan manufacturer with Reliance motors) and Reliance (motor manufacturer). The Reliance manual recommends Chevron SRI-2 lubricants but does not restrict the use of other types of lubricants. However, the Joy Manual directly specifies Chevron SRI-2 for nuclear applications.

The GGNS EQ program had not specified the lubricant types as required maintenance in ES-19 due to the acceptability of other types of lubricants for performing the lubricating function of mechanical equipment. SERI primarily uses Mobil manufactured lubricants at GGNS except where acceptable Mobil product substitutes (for vendor recommended lubricants) are not available.

III. The Corrective Steps Which Have Been Taken and the Results Achieved

The following actions have been taken to ensure proper tracking and use of lubricant types for the GGNS EQ program:

An EQDP has been prepared to establish an auditable file showing qualification of lubricants used at GGNS which are not covered by other EQDPs. This file establishes the current acceptability of Mobil lubricant products for GGNS and will include any future lubricant products if used in EQ applications.

IV. The Corrective Steps Which Will Be Taken To Avoid Further Violation

To preclude further violation of this nature, the following actions will be taken:

1. The GGNS Engineering standard (ES-19) for maintenance will be modified to indicate the fan motor lubricant type (Mobilux EP-2) to be used. A review of ES-19 for other similar lubricant specifications will be conducted and modified appropriately to reflect lubricant types for maintenance.
2. SERI will modify the GGNS EQDP for fan motors to indicate the acceptability of Mobilux EP-2 for motor lubrication. Any other EQDPs specifying other types of lubricants for which Mobil products are being used will be modified similarly.

V. Date When Full Compliance Will Be Achieved

1. Full compliance will be achieved for Section IV by June 30, 1988.