APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-498/89-34 Operating Licenses: NPF-76
50-499/89-34 NPF-80

Dockets: 50-498
50-499

Licensee: Houston Lighting & Power Company (HL&P)
P.O. Box 289
Wadsworth, Texas 77483

Facility Name: South Texas Project (STP) Electric Generating Station, Units 1 and 2

Inspection At: STP, Wadsworth (Matagorda County), Texas

Inspection Conducted: September 18-22, 1989

Inspectors: P. C. Wagner, Region IV
C. J. Paulk, Region IV
R. N. Moist, NRR

NRC Consultants: M. Yost, EG&G
T. Humphery, EG&G
D. Brosseau, Sandia

Approved: T. F. Stetka 10/17/89
T. F. Stetka, Chief, Plant Systems Section Date
Division of Reactor Safety

Inspection Summary

Inspection Conducted September 18-22, 1989 (Report 50-498/89-34; 50-499/89-34)

Areas Inspected: Special, announced team inspection of the programs implemented to ensure compliance with the equipment qualification (EQ) requirements contained in 10 CFR 50.49. The inspectors reviewed the procedures related to the procurement and maintenance aspects of the EQ program as well as those procedures directly related to the program. The inspectors evaluated the implementation of the EQ program by records review and visual inspection of installed equipment and spare parts as well as interviews with involved personnel.

Results: The inspectors found the EQ program to be acceptable, but identified a number of potential problems and two violations. The inspectors were provided prepared documentation packages for the components they had previously selected for review. This preparation by the licensee allowed the documentation inspection to proceed at a normal pace. The inspectors noted that the official file system would be difficult to use and audit. The inspectors found the programs for the EQ related procurement and maintenance activities to be good and the governing procedures for the overall EQ program to be good.

In addition to the concern over the filing system, the inspectors were concerned by their perception of heavy reliance by the licensee on contractor knowledge of the STP EQ system and by the organization of maintenance requirements into regular and special EQ systems in lieu of one common system. The licensee indicated that additions to the EQ staff were being pursued but considered the inspectors concern over separate maintenance systems to be unsubstantiated.

The inspectors experienced initial difficulties in performing the physical inspections of selected components because of a lack of coordination within the licensee's organization but received very helpful assistance from the assigned craft personnel when the inspections began. The inspectors also noted what was determined to be a lack of sensitivity on the part of involved EQ and contractor personnel in determining the operability of similar components within the shutdown Unit 1 and, more importantly, operating Unit 2 when qualification of a component was in question. This concern was also attributed to a small HL&P EQ staff and was most obvious during initial discussions on the qualification of certain motor operated valves subjected to submergence.

The inspectors identified two violations of NRC requirements during the inspection. The violations involved the failure to properly qualify components (paragraphs 4.c(2) and 5.c(2), two examples) and the failure to follow procedures (paragraphs 5.c(1), 5.c(3), and 5.f, three examples). The inspectors were concerned about the first of the violations because it appeared that the licensee had not fully evaluated the consequences of the operability of the accumulator outlet valves. The second violation included an instance in which an independent followup inspection by the licensee had failed to identify the nonconforming condition. This violation also included an instance where nonsafety-related equipment had been added to the list of equipment requiring qualification without sufficient effort to verify that all requirements were met.

DETAILS

1. Persons Contacted

HL&P

R. W. Chewning, Vice President, Nuclear Operations
S. L. Rosen, Vice President, Nuclear Engineering and Construction
W. S. Blair, Manager, Nuclear Support
M. A. McBurnett, Licensing Manager
S. M. Dew, Manager, Nuclear Purchasing and Material Management
W. H. Kinsey, Plant Manager, STP
T. J. Jordan, Manager, Plant Engineering
W. J. Jump, Maintenance Manager
A. C. McIntyre, Support Engineering Manager
S. S. Talwar, Equipment Qualification Support Engineer

HL&P Contractor Personnel

G. Kast, Impell
L. Hurst, Bechtel
R. Ulanday, Bechtel
B. Metro, Westinghouse

NRC Personnel

T. Stetka, Chief, Plant Systems Section, Region IV
J. Tapia, Senior Resident Inspector, STP

The above personnel all attended the exit meeting held on September 22, 1989. During the inspection, numerous other HL&P personnel and HL&P contractor personnel were contacted and a number of these also attended the exit meeting.

2. Introduction

The equipment in a nuclear power facility may be called upon to operate to mitigate the consequences of an accident; and the results of the accident could create a harsh atmosphere within the building in which the necessary equipment is located. Therefore, those components and systems which are necessary to ensure the protection of the public health and safety are required to be proven to be capable of performing their functions at any time in facility lifetime while subjected to the worst postulated conditions. The NRC presented early requirements for the environmental qualification of equipment in IE Bulletin 79-01B and followed this directive with guidance in NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," in December 1979. The establishment of formal equipment qualification (EQ) requirements was contained in the issuance of 10 CFR Part 50.49 in February 1983.

The NRC evaluated the EQ program implemented for the STP during the preoperational phase and found it to be acceptable. These evaluations are discussed in Supplemental Safety Evaluation Report (SSER) No. 4 for STP Unit 1 and SSER No. 6 for STP Unit 2. This inspection was conducted to ensure that the EQ program was being adequately implemented and the qualification of equipment was being adequately maintained.

The inspection was conducted in accordance with the guidelines contained in Temporary Instruction 2515/76, "Evaluation of Licensee's Program for Qualification of Electrical Equipment Located in Harsh Environments," and consisted of program reviews (including the procurement of EQ components), record reviews, and physical equipment verifications. The inspectors discussed their observations with both HL&P personnel and HL&P consultant personnel during the course of the inspection.

3. Programs Review

The inspectors evaluated the adequacy of the EQ program by reviewing the applicable procedures, the components selected for inclusion into the program, and the organization and staffing of the HL&P EQ personnel. The inspectors also evaluated the continued functioning of the EQ program by evaluating the maintenance and the procurement programs as they related to EQ.

a. EQ Program Review

The inspectors reviewed numerous facility administrative, engineering, and program procedures. A listing of the procedures that were reviewed is included in Attachment 1. The inspectors also reviewed the licensee documents which formed the basis for the EQ program:

- "Environmental Qualification of Safety-Related Electrical Equipment," Revision 1, dated February 1987
- "Equipment Qualification Design Criteria, Specification TPNS 4E19NQ1009," Revision 9, dated October 14, 1987

The inspectors found the controlling procedures and the basis for the EQ program to be good and had no problems in this area. However, the inspectors did have some difficulties with the EQ Master List (EQML). The EQML is a listing of all components required to be qualified.

The inspectors found the EQML difficult to use and understand. It contained not only electrical components, but mechanical components as well (e.g., hand operated globe valves). Also, a separate printout was necessary to obtain a listing of the postaccident monitoring equipment required to be qualified by the 10 CFR 50.49 reference to Regulatory Guide (RG) 1.97.

There was also some confusion on the use of the column on the EQML for EQ maintenance. If the maintenance column indicated that there was no maintenance required, then the life shown was the qualified life without any maintenance requirements. If the EQML indicated that a component had a 40-year life and the maintenance column indicated that there was EQ maintenance required, this meant that there were activities that needed to be performed to allow that equipment to remain operable for 40 years. Stating that a piece of equipment has a qualified life of 40 years provided its parts are replaced periodically is misleading; the qualified life is actually based on the limiting components. Utilizing a method of indicating equipment qualified life based on the lifetime of limiting component parts and their maintenance requirements would eliminate confusion in the future.

While the EQML appeared to include the required equipment (after adding the RG 1.97 equipment), there may have been some items which were not required to be on the list. The inspectors noted that items may have been placed on the EQML early in its development and left there because that was easier to do than performing the necessary evaluations to remove them. This conclusion was reached after interfacing mainly with contract personnel rather than licensee personnel. By relying heavily on contractors, the licensee had weakened the corporate knowledge base and appeared to now have little experience, overall, in the EQ area. The licensee stated that this was recognized and that steps were underway to increase the size of the EQ group in order to develop the necessary experience and knowledge base.

With the exception of the size and, therefore, ability of the HL&P EQ staff to manage the EQ program, and the observations about the EQML, the inspectors found the EQ program to be a good system to ensure properly qualified components are utilized at the STP. No violations or deviations were identified with the general EQ program.

b. Maintenance Program Review

The inspectors reviewed the maintenance procedures listed in Attachment 1 to evaluate the adequacy of the program to maintain the qualification of electrical equipment important to safety that is required to operate in a harsh environment.

The licensee ensured that equipment qualified life was not exceeded by establishing the maintenance due date as 80 percent of the qualified life. If this date is missed, the qualification would not be affected, and there would still be time to perform the required activity before the qualified life was exceeded. There had been only one case of the qualified life being exceeded, which occurred because the replacement part did not arrive in time. The licensee performed an evaluation in accordance with their procedures to address the operability of the component while they waited for the replacement

part. Had the evaluation indicated that the part would not have functioned, they would have declared that equipment inoperable. The inspectors determined that the licensee should not experience any problems with exceeding the qualified life of equipment utilizing these methods.

The licensee had implemented a vibration analysis program and was in the process of implementing a lubricant sampling program. The licensee will utilize the results of these programs to evaluate the possible extension of the qualified life of various components.

An area of concern to the inspectors was the method of identifying all EQ required maintenance activities. Any specific maintenance action identified in the EQ test report was placed in the Special EQ Maintenance Book (SEQMB), unless the specific action was also found in the vendor maintenance manual and placed in the preventive maintenance (PM) index. While no problems were identified, the inspectors were concerned that any change in the STP philosophy relating to the inclusion of "vendor recommended maintenance" in the PM index could result in the omission of a required maintenance action. A single, complete list of EQ maintenance requirements would also appear to be easier to maintain and should ensure that all required maintenance is adequately addressed.

As mentioned in later paragraphs, there were instances wherein the inspectors identified poor maintenance practices. These instances were attributed to a lack of attention to detail by some craftsmen, not a pervasive problem with the maintenance program at STP. In general, the workmanship was acceptable.

Notwithstanding the above concern, the inspectors found the maintenance program, as it related to ensuring the continued EQ of components, to be a good program. The inspectors had no further questions in this area and no violations or deviations were identified.

c. Procurement Program Review

(1) Program Review

The inspectors reviewed the documents listed in Attachment 1 and made the following observations about the procurement program.

The Nuclear Group Policy, NGP-1110, "Procurement of Materials/Service and Management of Materials," placed the responsibility on the Nuclear Purchasing and Materials Management (NPMM) Department for the development and implementation of comprehensive procurement, contracting and materials management procedures. This policy accomplished the objective of ensuring the availability of spare parts,

materials, services, and supplies in accordance with technical, quality, and regulatory requirements.

The NPMM procedure "Preparation of Requirements for Items and Services," NPMMP-4.12Q, established the requirements and responsibilities for the preparation and review of purchase requisitions for items and services associated with South Texas. This procedure also established conditions related to procurement of nonsafety-related items to be used in safety-related equipment as well as commercial grade items for installation in safety/quality related equipment to support plant operation.

At present, HL&P does not purchase any commercial spare parts for EQ components. The inspectors' review of Procedure NPMMP 4.12Q and Specification No. 5AQ10WS0026, "Parts Classification and Commercial Grade Items Dedication in Safety-Realted Applications" indicated that each document was consistent with the guidance generally used to determine the acceptability of commercial grade items. This guidance is contained in the Electric Power Research Institute (EPRI) Specification NP-5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety-Related Applications."

QAP-2.6, "Procurement Document Control," established the method for quality engineering review of documents related to safety-related procurements.

(2) Program Implementation

The inspectors reviewed the EQ purchase orders (POs) listed in Attachment 2 and associated purchase requisitions to verify implementation of above procedures. The POs were selected at random from special EQ requirements in the SEQMB.

The inspectors verified that the technical and quality requirements listed in the purchase requisition were also included in the issued purchase order. The inspectors verified that appropriate signatures were annotated on purchase requisition and technical and quality requirement sheets, that document revisions received proper review, that procurement documents adequately described the item to be supplied, that technical requirements had been referenced, that the proper level of procurement was specified, that the vendor was on the HL&P vendor list, that packaging and shipping requirements were specified, that the requirement that the vendors' QA programs to comply with Appendix B to 10 CFR 50 was specified, that a statement to the applicability of 10 CFR 21 was included, and that a QA code was listed. The inspector determined that the implementation of the procurement program was in accordance with HL&P procedures.

The inspectors selected the POs to verify that a receipt inspection report (RIR) was generated. All of the POs had an RIR completed except for PO RS0009378 dated February 14, 1989, that dealt with Combustion Engineering terminal blocks. The items for this PO had not been received as of this inspection, however, the inspectors verified that a quality requirements sheet was in the receiving inspection file. The inspectors determined that inspection characteristics checked on the RIR were accomplished by receiving inspection personnel with supporting documentation (such as Certificates of Compliance/Conformance) attached and that the RIR was signed by the QA inspector. The RIR also annotated that the receiving warehouseman perform a shipping damage inspection and sign the appropriate signature block.

The inspectors also verified that the items were properly stored in an appropriate location, that a QA accept tag/acceptance stamp was annotated on the outside of the package in which the item was stored, that the PO number matched the above listed POs, that the total plant numbering system was identified, that the HL&P part was identified, and that the RIR number was identified. The inspectors determined that proper storage and identification of EQ items was being implemented in accordance with HL&P procedures.

(3) Previous Inspection Followup

The inspectors followed up on a 10 CFR 50.55(e) report concerning Veritrak transmitters at STP. The NRC (Vendor Inspection Branch) performed an inspection at Tobar Corporation (IR 99900837/86-01) on November 3-5, 1986, to obtain additional information on the Veritrak transmitters which exhibited setpoint drift problems. The inspectors determined during the inspection that Veritrak transmitters supplied to the Seabrook Facility were manufactured by Westinghouse and that subsequent tests by Tobar at stabilized ambient temperatures indicated that the deviation from the reference accuracy exceeded the acceptance requirements at certain temperatures. The inspectors reviewed the final report concerning the Veritrak transmitters submitted to the NRC by HL&P and found that Westinghouse had completed a test program which demonstrated that temperature drift will not increase with time. Thus, Westinghouse concluded that the statistical errors applied in the interim safety analyses bound the temperature compensation shift over the qualified life of the transmitters. The test program yielded results that supported the initial justification for continued operation and did not identify any required field modification. The inspectors had no further questions in this area.

The inspectors found the procurement program's organization, controls and implementation to be good and had no remaining questions in this area. No violations or deviations were identified.

4. Records Review

The inspectors evaluated the adequacy of the EQ documentation by reviewing the files for typical components. The inspectors had selected the components by equipment identification number (or Tag No.) from the EQML that had been provided prior to the inspection. The inspectors requested that the licensee have the documentation packages for the selected components available for onsite review and that those components be available for physical inspection.

The Equipment Qualification Program described in Procedure OEP-3.110 required the establishment of an Equipment Qualification Checklist Package (EQCP) for each of the components listed in the EQML. The licensee did not maintain the records required for the EQCPs in a separate file by component, but rather filed the information by PO number. The licensee did, however, gather the various records together into binders for each of the selected components. The licensee's efforts to provide these easily auditable records enabled the inspectors to conduct numerous reviews which would have otherwise been very difficult to complete. The inspectors mentioned their concern that the file system being utilized could lead to future difficulties in maintaining auditable records to ensure proof of component qualification. The licensee did not, however, share this concern.

During the EQCP reviews, a number of findings and observations were discussed with the licensee; the more significant of these are the following:

a. Containment Temperature

Because the EQ program was conducted by PO number, the inspectors noted that the same component in similar use, in the same area could have different qualification parameters and different qualified conditions (e.g., two vendors for a similar component made different assumptions for the normal operating temperature the component would experience even though both would be located in the same area; these assumptions resulted in different qualified lifetimes).

In order to evaluate the adequacy of the assumptions made for the normal operating temperatures of components located within the reactor containment building (RCB), the inspectors requested documentation of temperatures recorded during the summer months while Unit 1 was operating at nearly full power. The NRC had reviewed preliminary temperature data collected in mid-1988 during the startup testing phase of Unit 1 operations to provide early assurance that the general area temperatures were within prescribed limits; this information is contained in NRC Inspection Report 50-498/89-06;

50-499/89-06. The earlier information and the documentation provided during this inspection was derived from the average of the temperatures measured at the inlets of the air recirculation units. While this information provided evidence that the general area temperatures remained within acceptable limits, it did not ensure that localized areas do not experience higher than anticipated temperatures.

The inspectors discussed this concern with licensee personnel and were informed that a procedure had been written which, when implemented during the next refueling cycle for Unit 1, would provide specific area temperature information. The procedure, 1TEP07-XC-0001, "Reactor Containment Building Temperature Survey," dated June 19, 1989, provided for placing approximately 35 temperature sensitive tapes at selected locations throughout the RCB.

Inspector Followup Item (498/8934-01; 499/8934-01): Review the results of the licensee's temperature survey when the tapes are collected and the results documented.

b. EQCP Completeness

The inspectors noted that the requirement in Procedure EI-7.03 "Guidelines for the Preparation, Review, and Approval of EQCPs," that each EQCP contain an Environmental Equipment Qualification Checklist was not being implemented for those components provided by Westinghouse Corporation as part of the Nuclear Steam Supply System (NSSS). For those NSSS packages, in lieu of the detailed checklist, there was an abbreviated checklist and a note that an agreement with HL&P had been reached. The licensee explained that the EQCPs for most components had been completed by their consultants prior to HL&P assuming responsibility for the EQ program. As such, the consultants performed all of the necessary reviews and checks; the checklists in the NSSS packages represented only the final turnover to HL&P. The requirement in EI-7.03 was meant to be a forward looking responsibility so that changes or modifications to any EQCP would receive a total review; it was never the intent, HL&P personnel stated, that the requirements of the "newer" procedure be backfit on existing EQCPs that they had approved.

In order to avoid potential future misunderstandings about the required contents of the EQCPs, the licensee will revise Procedure EI-7.03 to clarify that future changes (any made after September 25, 1989) to the NSSS EQCPs would comply with the procedure.

c. EQCP Reviews

The inspectors reviewed a number of EQCPs to evaluate their completeness and adequacy in verifying qualification. A listing of

the EQCPs that were reviewed is contained in Attachment 2. The licensee provided the necessary documentation to clarify the proper qualification of all components reviewed except for the lifetime of certain solenoid operated valves (SOVs) and a motor operated valve (MOV) subjected to submergence.

(1) SOV Qualified Lifetime

While reviewing the EQML, the qualified life of ASCO SOVs was questioned. Some of the SOVs were indicated to have 40-year lifetimes in a 140°F normal environment, while others were only 8 years. Further investigation revealed that the SOVs were not totally qualified for 40 years, but that their life could be extended to 40 years if parts were replaced at shorter intervals.

The length of life of the parts was then inspected. The inspectors noted that these lifetimes appeared to be too long based on prior experience. The licensee explained that an appendix to an ASCO test report was used to develop the qualified lifetimes. This appendix stated that two coils were thermally aged at 161°C and the licensee had used this value to perform Arrhenius calculations for lifetime evaluations.

After discussing the use of 161°C instead of the 121°C documented in the test report, the licensee subsequently performed preliminary calculations that reduced the lifetimes of the SOVs to a range that was closer to those the inspectors had previously encountered. The preliminary calculations indicated that no SOV would exceed its qualified lifetime prior to the next refueling outage scheduled for spring 1990. This issue is considered to be unresolved pending additional evaluation by the licensee on SOV qualified life and operability.

Unresolved Item (498/8934-02; 499/8934-02): Evaluate the qualified lifetime of ASCO SOVs to ensure that they remain operable.

(2) MOV Subject to Submergence

During the review of EQCP-4000(HE-1) for NSSS Limitorque valve actuators, the inspectors noted that certain actuators and the Namco, stem mounted, position indication limit switches could become flooded in a design basis accident. The valves in Unit 1 were identified by Tag Nos. B1SI-MOV-0039A, B, and C. These valves are the safety injection accumulator outlet isolation valves which are normally open but are required to be closed following an accident in accordance with emergency procedures. Neither the valves' actuators, limit switches nor electrical cabling were documented to be qualified to operate in a postaccident submerged condition. The environmental testing of these NSSS actuators and limit switches was documented in WCAP-8687, Supplement 2 which had been provided to HL&P by Westinghouse Corporation.

In response to questions from the inspectors about the qualification (and hence operability) of the valves, the licensee reevaluated the potential postaccident conditions in both Units 1 and 2. The licensee recalculated the potential flood heights for various accidents for which the valves would be required to be repositioned and measured the actual heights of the valves' components. Based on this preliminary information, the licensee determined that the qualification of only one valve in Unit 1 (B1SI-MOV-0039B) was not assured. The licensee determined that all of the actuators and limit switch assemblies were located above the postulated flood heights but that the electrical cabling for this actuator and its associated limit switches would be submerged. The licensee acknowledged that corrective actions for the valve in question would be required prior to declaring the valve operable and that the postaccident flooding calculations for both units would need to be finalized in response to this issue. Since the electrical cabling was not verified to be operable in all postaccident (and submerged) atmospheres, this is considered to be a violation of 10 CFR 50.49 (e).

Violation (498/8934-03): Failure to ensure the EQ of the electrical cabling for Valve B1SI-MOV-0039B.

While no other violations or deviations directly related to the review of the EQCPs were identified, the inspectors noted a hesitancy on the part of the licensee representatives in evaluating the effect of questions related to a specific EQCP to other similar components especially those components in Unit 2, which was in operation at the time of the inspection. The inspectors attributed this to the apparent strong reliance on the assistance of consultant personnel by the small HL&P EQ staff and the appearance that neither group was familiar with other regulatory requirements. The inspectors mentioned their concern that the licensee did not appear to have an internal EQ staff of sufficient size to continue to properly implement the EQ program. Licensee management acknowledged that HL&P was continuing to rely heavily on EQ consultants and was in the process of attempting to expand the EQ staff.

5. Equipment Inspections

The inspectors evaluated the adequacy of the EQ components by performing physical inspections of the installed equipment. A number of delays were encountered in starting this phase of the inspection due to a lack of coordination between the various licensee organizations involved in this effort. However, once these initial obstacles were overcome, the inspectors received very good assistance in making equipment available for inspection (e.g., valve actuators were opened, covers were removed from electrical boxes, etc.).

Prior to the start of the equipment inspections the inspectors reviewed the STP Electrical Connection Specification 5E189ES1004, "Cable Splicing, Terminations, and Supports," Revision 10, dated April 26, 1988, and the

EQCPs for the components to be inspected. The inspectors reviewed the System Component Evaluation Worksheets (SCEWs) in the EQCPs to determine any special or specific attributes which should be observed during the inspections.

The inspectors made the following hardware observations which were discussed with the licensee:

a. Hydrogen Recombiner, Tag No. 2N151NHR101A

The hydrogen recombiner was inspected to verify proper installation of the special Raychem splice kit for the termination of the heater cables. The splices were found to be acceptable, and no discrepancies were noted.

b. General Atomics High Range Radiation Monitor (HRRM), Tag No. CIRA-RE-8051

The HRRM was found to have a large dent in the detector housing. The licensee was asked to identify what type detector was used and to determine if the damage to the housing would affect the qualification and/or operation of the HRRM. The licensee responded that the detector was an ion chamber and that the damage would not affect the operation of the detector.

The connections of the HRRM to the field cable were also examined. They consisted of many sleeves of Raychem heat shrinkable insulation. The final layer of sleeving did not appear to be nuclear qualified material in that there was no evidence of the sealing material. The licensee provided General Atomics installation details that described the connection and the sleeving process. This was found to be acceptable.

c. Limitorque Motor Operated Valves (MOVs)

(1) A1S1-MOV-0039A

This actuator was inspected as being representative of the motor operated valves included in EQCP-4000 (HE-1). The inspectors noted that some of the wires connected to the terminal block had very sharp bends (greater than 90 degrees). The bending of the wire greater than 90 degrees is not permitted by Specification 5E189ES1004. This specification restricts the bends to 90 degrees or less. Additionally, Construction Inspection Plan (CIP) 2.2-62 required that the wires be inspected to ensure the conditions were in accordance with the specification. The inspection was performed and documented that the wires were in accordance with the specification. Not only were the wires bent, but the verification was not properly performed. Failure to adhere to the requirements of Specification 5E189ES1004 is considered to be a violation of 10 CFR Part 50, Appendix B.

Violation (498/8934-04; 499/8934-04): Failure to follow the installation and inspection procedures which specified the minimum bend radius of wires.

(2) A1AF-MOV-0048

This actuator was inspected as being representative of motor operated valves included in EQCP-6548. Evidence of moisture intrusion noted in the limit switch compartment was traced to an apparently failed gasket. Rust and corrosion was noted on the gasket surface as well as terminal block contacts. Additionally, the grease relief was found to have been broken off.

Since 10 CFR 50.49(f) requires that the equipment installed in the field be qualified by testing and analysis, the MOV was in an unqualified configuration because it did not have a functional gasket and the grease relief was broken off. This is an apparent violation of 10 CFR 50.49(f).

This violation is considered to be another example of the violation identified in paragraph 4.c(2) of this report.

(3) D1AF-MOV-0514

This actuator was inspected as being representative of motor operated valves included in EQCP-4053. The inspectors noted that the terminal block (TB) had conductors landed on adjacent terminals rather than alternate terminals as specified in Limitorque Test Report B0009.

Specification 5E189ES1004 prohibits the use of TBs inside containment but states that when TBs are vendor supplied for a specific reason on equipment inside containment or the intermediate valve cubicle (IVC), they may be used only for that purpose. Limitorque tested the subject terminal block for power connections using alternate terminal connections as stated in the B0009 report. Therefore, the installed leads were not in accordance with the intent of the specification, nor was the configuration tested in B0009. Additionally, CIP 2.2-62 was also performed on this MOV to verify that the wiring was on alternate terminals. The procedure incorrectly documented that the connections were on alternate terminals. Not only was the installation performed incorrectly, but the verification was inaccurate. This is an apparent violation of 10 CFR Part 50, Appendix B relating to procedure adherence.

This violation is considered to be another example of the violation identified in paragraph 5.c(1) of this report.

(4) A1AF-FV-7525

This actuator was inspected as being representative of motor operated valves included in EQCP-4409. The inspectors noted that the licensee had removed the nylon crimp connectors for the dual voltage motor leads and replaced them with qualified Raychem splice kits.

The MOV did not have the T-drains nor the grease relief that were implied by the SCEW sheet. The SCEW sheet indicated that the valve had to operate during an high energy line break (HELB) in the IVC as well as a LOCA/HELB inside containment. In reality, the valve is only required for a LOCA/HELB inside containment and would therefore be subject only to a radiation harsh environment. The licensee acknowledged that the SCEW sheet was misleading and stated that a clarification would be made.

c. Rosemount Transmitters, Tag Nos. A1CC-FT-4530 and B1CC-FT-4547

These transmitters were inspected as representative of EQCP-4332. No discrepancies were noted.

e. NAMCO Limit Switch, Tag No. A1SI-ZSO-0039A

This limit switch was inspected as representative of EQCP-4000 (HE-3/6). No discrepancies were noted other than the submergence issue discussed in paragraph 4.c(2) of this report.

f. Barton Transmitters, Tag Nos. N1SI-FT-0901 and N1SI-FT-0852

These transmitters were inspected as representative of EQCP-4000 (ESE-3A). The inspectors noted that the junction boxes associated with the transmitters (N1SITB0901 and N1SITB0852) contained Raychem splices that did not appear to be acceptable in that the sleeve was not adequately sealed in accordance with the installation procedure. It was also not apparent that shims had been used to provide an adequate sealing length in these applications as would have been expected.

The licensee had the suspect splices removed and available for inspection by the inspectors after the exit interview. The inspectors watched as the splices were disassembled by an electrician. The splices from FT-0901 did not have shims and were not adequately sealed. The splices from FT-0852, on the other hand, had shims and were adequately sealed.

The licensee explained that these transmitters were initially installed as nonquality-related as denoted by the "N" in the Tag No. The transmitters were added to the EQ list as a result of the requirement in 10 CFR 50.49 that certain postaccident monitoring

instrumentation (as designated in Regulatory Guide 1.97) be properly qualified. Because of their original installation as nonquality-related instruments, the more stringent QA guidelines used for safety-related installations were not originally required to be implemented. However, when the instruments were upgraded, the licensee did not verify the adequacy of the installations for this type of equipment. The identification of the improperly installed splices in FT-0901 was identified as an apparent violation of 10 CFR Part 50, Appendix B relating to procedure adherence.

This violation is considered to be another example of the violation identified in paragraph 5.c(1) of this report.

g. ASCO Solenoids, Tag Nos. A1AF-FY-7517 and B1CC-FY-4548

These SOVs were inspected as representative of EQCP-4026.

B1CC-FY-4548 did not have a vendor name plate attached to verify that it was the proper model solenoid. The only identification was the licensee's tag number. The licensee was able to use the tag number to trace back to identify what type solenoid was installed. Not having the name tag would present problems with field walkdowns and verifications performed by the licensee and is an example of the poor maintenance practices that were discussed in paragraph 3.b.

A1AF-FY-7517 did not have an electrical conduit seal assembly (ECSA) installed and the coil assembly was loosely mounted. Either of these conditions would have permitted moisture intrusion if the valve was required to operate in an HELB scenario. The SCEW sheet indicated that the valve would be required to operate in such conditions, however, this is another example of the confusion caused by inaccurate SCEW sheets identified with A1AF-FV-7525, above. This valve is only required to operate for a LOCA/HELB inside containment and would be subjected only to a radiation harsh environment. The licensee stated that this inconsistency will be corrected along with the A1AF-FV-7525 problems.

The splices for A1AF-FY-7517 were located inside the attached flexible conduit and were installed with Raychem heat shrinkable insulating sleeves that were shrunk over the braided material of the leads. Since it appeared that there was more than 2 inches of sealing length that did not cover the braided material, the configuration complied with the licensee's installation instructions which were supported by test data. However, the braided material was frayed where the leads entered the solenoid housing which indicated some mechanical wear. This is another example of the poor maintenance practices discussed in paragraph 3.b.

While inspecting A1AF-FY-7517, the wires for the auxiliary feedwater pump turbine trip solenoid were noted to be hanging below the junction box. This condition was not in accordance with the

installation specification, however, the licensee had identified this problem and had issued a work request to correct the problem prior to this inspection. The licensee inspected the same component on Unit 2 without identifying any problem.

h. Target Rock SOVs, Tag Nos. A1SI-PV-3928-01 and B1SI-HV-0899-01

These SOVs were inspected and found to be installed in accordance with their tested configuration. There was no evidence of a problem identified by the vendor that involved the cracking of the wires or terminal boards as a result of heat or radiation. The only problems identified were those of poor workmanship. For example, two screws were found in the bottom of the switch compartment on one of the valves. On the other valve, separation barriers between adjacent terminals on the TB had been broken by apparently using a screwdriver that was too large, and terminal screws were missing resulting in the placing of two wires on the same screw. These are further examples of the poor workmanship identified by the inspectors.

6. Unresolved Items

Unresolved items are matters for which more information is necessary for the inspectors to ascertain if the matter is acceptable, a deviation, or a violation. An unresolved item related to the qualified lifetimes of various SOVs is identified in paragraph 4.c.(1) of this report.

7. Exit Interview

The inspectors summarized the scope and findings of the inspection during the exit interview on September 22, 1989, with the personnel identified in paragraph 1, above. Although some proprietary documents were reviewed by the inspectors, no proprietary documents were removed from the facility, and no proprietary information is contained in this report.

ATTACHMENT 1
LIST OF DOCUMENTS REVIEWED

Procedure Number	Title	Revision and Date
IP-5.1Q	Procurement of Items	Revision 5 dated 8/30/89
NPMMP-4.11Q	Technical Evaluation of Bidder's Proposals	Revision 0 dated 12/30/88
NPMMP-4.12Q	Preparation of RPDS for Items and Services	Revision 0 dated 1/1/89
IP-3.1Q	Plant Modifications	Revision 6 dated 7/28/89
IP-3.11Q	Onsite Certification of Items	Revision 1 dated 2/27/87
OEP-3.05Q	Preparation of Modification Design Package	Revision 5 dated 7/25/89
IP-3.24Q	Engineering Change Notice Package	Revision 3 dated 7/28/89
OPGP03-ZE-0010	Qualification Maintenance Program	Revision 1 dated 3/31/88
OPGP03-ZM-0002	Preventive Maintenance Program	Revision 18 dated 7/10/89
OPMP02-ZG-0005	Work Planning	Revision 0 dated 4/10/89
IP-1.12Q	Equipment Qulaification Program	Revision 1 dated 2/24/89
EI-7.03	Guidelines for the Preparation, Review, and Approval of Equipment Qualification Checklist Package (EQCP)	Revision 0 dated 12/13/88
OEP-3.11Q	Equipment Qualification Program	Revision 5 dated 7/5/89
	South Texas Project Unit 1 Environmental Qualification of Safety-Related Electrical Equipment	Revision 1 dated 2/87
OPG03-ZM-0002	Preventive Maintenance Program	Revision 18 dated 7/10/89
OPGP03-ZM-0004	Lubrication Program	Revision 5 dated 10/11/88
OPGP03-ZB-0009	Lubrication Monitoring Program	Revision 1 dated 10/29/86
OPEP06-ZA-0001	Vibration Monitoring Program Description	Revision 4 dated 9/3/87
OPMP02-NZ-0013	Cable Terminations	Revision 0 dated 5/26/89
OPMP02-NZ-0053	Raychem Insulation Application	Revision 1 dated 1/12/88

QAP 2.6	Procurement Document Review	Revision 1 dated 5/20/88
NGP 1110	Procurement of Material/Services and Management of Materials	Revision 0 dated 6/13/88
STP FSAR Section 17.2	Procurement Document Control	Amendment 62
Operations Quality Assurance Plan, Section 7.0	Procurement	Revision 4 dated 6/1/89
Specification No. 5A010WS0026	Specification for Parts Classification and Commercial Grade Items Dedication in Safety Related Applications (includes Document Change Notice No. MS-9, dated 9/14/8[illegible])	Revision 0 dated 4/14/89

ATTACHMENT 2
LIST OF RECORDS REVIEWED

EQCPs

1. EQCP-4000 (HE-1) "Limitorque Valve Actuators (Inside Containment Applications)," Tag No. A1S1-MOV-0039A

2. EQCP-6458 "Limitorque Valve Actuators (Outside Containment Applications)," Tag No. A1SF-MOV-0048

3. EQCP-4053 "Limitorque Valve Actuators (Trip and Throttle Valve on Turbine Driven Auxiliary Feedwater Pump)," Tag No. D1AF-MOV-0514

4. EQCP-4409 "Limitorque Valve Actuators (Auxiliary Feedwater System)," Tag No. A1AF-FV-7525

5. EWCP-4332 "Rosemount Transmitter," Tag Nos. A1CC-FT-4530 and B1CC-FT-4547

6. EQCP-4000 (HE 3/6) "NAMCO Limit Switches," Tag No. A1SI-ZSO-0039A

7. EQCP-4000 (ESE-3A) "Barton Differential Pressure Tansmitters," Tag Nos. N1S1-FT-0852 and N1S1-FT-0901

8. EQCP-4026 "ASCO Solenoid Valves," Tag Nos. A1AF-FY-7517 and B1CC-FY-4548

9. EQCP-4000 (4E-10A), "Target Rock Solenoid Valve," Model 79AB-001 supplied by Westinghouse.

10. EQCP-4119/8119, "Cooling Fan and Motor," Buffalo Forge Fan With Westinghouse 5HP Motor.

11. EQCP-4000 (HE-9), "Garrett Solenoid Valve" Reactor Coolant Pressurizer Relief Valve

12. EQCP-4301, "GA High Range Radiation Monitor"

13. EQCP-6488, "Brand Rex Instrument Cable"

14. EQCP-4075, "Rockbestos 600 V. Instrument Cable"

15. EQCP-4046, "Okonite 600 V. Power Cable"

16. EQCP-4058, "Okonite 600 V. Control Cable"

17. EQCP-6398, "BIW 600 V. Power Cable"

18. EQCP-6399, "Rockbestos 600 V. Control Cable"

19. EQCP-6415, "Okonite 5, 15 KV Power Cable"

20. EQCP-6506, "Okonite 600 V. Power Cable"

21. EQCP-4000-ESE-43A, B, D, G; ESE-44A (5 files), "Westinghouse Incore Thermocouple System Components"

Procurement Records

Number	Date	Component	Vendor
RS2708	1/14/88	Gasket	Westinghouse
B-0082 Supp. 23	11/17/86	O-ring	Westinghouse
RS0010097	1/17/89	Insulation Kit	Raychem
RS0009892	1/10/89	Gasket	Namco Controls
RS0011761	4/13/89	Thermocouple Assy.	Conax Corp.
RS0002722 Supp. 1	4/08/89	Assembly, Gage Valve for EPA	Westinghouse
RS0010856 Supp. 4	4/28/89	Pressure Transmitter	Rosemount
RS0009272	12/16/88	Pinion	Limitorque
RS0009387	2/14/89	Block, Terminal	Combustion Eng.