U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Report Nos:	50-327/86-70; 50-328/86-70
Docket Nos:	50-327/328
License Nos:	DPR-77, DPR-79
Licensee:	Tennessee Valley Authority 6N 38A Lookout Place 1101 Market Street Chattanooga, Tennessee 37402-2801
Facility Name:	Sequoyah Nuclear Plant, Units 1 and 2
Inspection At:	Chattanooga, Tennessee
Inspection Conducted:	December 8-12, 1986

Inspector: G. T. Hubbard 3/2/87
G. T. Hubbard, Equipment Qualification & Test Engineer (EQ&TE) Date

Also participating in the inspection and contributing to the report were:

O. P. Gormley, EQ&TE, IE
A. B. Ruff, Reactor Inspector, RII
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Approved by: U. Potapovs 3-3-87
U. Potapovs, Chief, Equipment Qualification Inspection Section, IE Date

INSPECTION SUMMARY

Inspection on December 8-12, 1986 (Inspection Report Nos. 50-327/86-70; 50-328/86-70)

Areas Inspected: Announced inspection to review the licensee's maintenance program for ensuring that as installed and as maintained 10 CFR 50.49 qualified equipment is in accordance with qualification documentation. The inspection also concentrated on maintenance related issues for qualified equipment identified during previous NRC inspections.

Results: The inspection identified no programatic deficiencies with regard to the SQN maintenance of environmentally qualified equipment. Open Item 50-327, 328/86-01-05 and Unresolved Item 50-327,328/86-42-02 from previous NRC inspection reports were resolved. Additionally, the concerns identified in Mr. J. M. Taylor's letter to Mr. S. A. White dated July 31, 1986, are resolved. Adequate corrective action on Potential Enforcement/Unresolved Item 50-328/86-01-15 was confirmed.

The inspection determined that the "piece part" procurement violation identified in Inspection Report 50-327,328/86-61, dated November 14, 1986, affected environmentally qualified equipment. Since qualified equipment is affected, the EQ inspection team will follow the resolution of the "piece part" issue to assure adequate resolution relative to qualified equipment prior to restart. Prime responsibility for resolution of the overall issue will remain with the inspection team identifying the violation.

Items remaining unresolved from Inspection Report Nos. 50-327,328/86-01:

Name	Item Number
Potential Enforcement/Unresolved Items:	
1. Raychem Splices/Breakouts	50-327/86-01-15; 50-328/86-01-16
Open Items:	
1. Completion of EQ Training	50-327/86-01-01; 50-328/86-01-01
2. Completion of Audit Corrective Actions	50-327/86-01-02; 50-328/86-01-02
3. Revision To Maintenance Procedure SQM 62	50-327/86-01-03; 50-328/86-01-03
4. Completion of Maintenance Program	50-327/86-01-04; 50-328/86-01-04

DETAILS

1. PERSONS CONTACTED:

1.1 Tennessee Valley Authority (TVA)

*H. L. Abercombie, Sequoyah Site Director
D. W. Wilson, Project Engineer
*W. L. Elliot, EQ Project Manager
*L. M. Nobles, Plant Superintendent
*T. E. Spinks, Replacement Items Program Manager
*S. W. Littrell, EQ Coordinator
*M. R. Harding, Site Licensing Manager
P. R. Wallace, Plant Manager
*B. M. Patterson, Maintenance Superintendent
*B. W. Hooper, Electrical Engineer
*M. A. Skarzinski, Electrical Maintenance Supervisor
*L. P. Woodley, Jr., EQ Section Supervisor
*A. E. Ives, EQ Maintenance
*M. A. Cooper, Compliance Licensing Engineer
*J. Blankenship, Manager Information Office
*W. E. Andrews, Site Quality Manager
*L. D. Alexander, Modification Section B Supervisor
*R. A. Stockton, Modification Section A Engineering Supervisor
*W. S. Wilburn, Maintenance
*D. L. Jeralds, Maintenance
*R. L. Bruce, Maintenance-Special Projects Supervisor
*L. J. Wheeler, Methods and Procurement Services Supervisor
*H. D. Elkins, Instrument Maintenance Supervisor
*S. D. Scott, Instrument Engineer
*J. W. Kelly, Engineering Assurance Engineer
*A. H. Ritter, Engineering Assurance Engineer
*J. H. Sullivan, Supervisor, Plant Operations Review Staff (PORS)
R. H. Smith, Supervisor Quality Implementation
M. R. Sedlacik, Supervisor Modification Section A
R. W. Olson, Modification Supervisor
W. H. Deen, EQ Section Supervisor
J. D. Smith, PORS
J. M. Anthony, Operations Group Manager
G. B. Kirk, Compliance Licensing Supervisor
R. H. Buchholz, Site Representative

1.2 Consultants

B. J. Crane, Westec Services, Inc.

1.3 NRC

*B. K. Grimes, Director, Division of Quality Assurance, Vendor and Technical Training Center, IE
*G. G. Zech, Director, Division of TVA Projects, RII

*Denotes those present at the exit meeting

2. PURPOSE:

The purpose of this inspection was to continue the review of the licensee's implementation of a program to meet the requirements of 10 CFR 50.49 for Sequoyah Nuclear Plant (SQN), Units 1 and 2.

3. BACKGROUND:

On August 21-22, 1985, TVA shutdown both units at SQN due to concerns that documentation at TVA nuclear sites might be inadequate for environmental qualification of electric equipment within the scope of 10 CFR 50.49. Since that time, TVA has initiated an indepth program to ensure that environmental qualification of all electric equipment within the scope of 10 CFR 50.49 is established at SQN prior to restart.

In order to evaluate the new program at SQN, the NRC/IE has conducted three inspections of the SQN program and has documented the results in NRC inspection report 50-327,328/86-01, dated August 15, 1986. This inspection is a continuation of the NRC evaluation of the SQN equipment qualification (EQ) program and its implementation. This inspection focused on maintenance activities for environmentally qualified equipment with special emphasis on SQN's approach for assuring that as installed and as maintained equipment is in accordance with qualification documentation. During the inspection, reviews were also conducted on some of SQN'S corrective actions on EQ related findings identified in previous NRC inspections.

4. FINDINGS:

A. Followup of Previous Inspection Findings

The NRC inspectors reviewed SQN's corrective actions relative to some of the unresolved findings identified during the three previous EQ inspections. Status of the unresolved items is discussed in the following paragraphs.

Open Items:

(1) (Open) Completion of EQ Training (50-327,328/86-01-01)

No review of this item was performed during the inspection; therefore, it remains open.

(2) (Open) Correction of Audit Corrective Actions (50-327,328/86-01-02)

No review of this item was performed during the inspection; therefore, it remains open.

(3) (Open) Revision of Maintenance Procedure SQM 62 (50-327,328/86-01-03)

No review of this item was performed during the inspection; therefore, it remains open.

(4) (Open) Completion of Maintenance Program (50-327,328/86-01-04)

At the time of the inspection SQN had not completed all required maintenance activities for qualified equipment; therefore, maintenance program status was not part of the inspection. This item remains open.

(5) (Closed) Equipment Maintenance History effects on Qualification (50-327,328/86-01-05)

See discussion in paragraphs 4.B.

Potential Enforcement/Unresolved Items:

(1) (Closed) Barton Transmitter, Lot 7-764 (50-328/86-01-15) During the June 1986 EQ inspection it was determined that Barton level transmitters 2-LT-3-43 and 2-LT-3-56 were installed in the plant such that the conduit fittings to the transmitters were at or below flood level. Since conduit fittings below flood level is not allowed by the licensee's qualification criteria, the fittings were required to be moved. During the plant walkdown of this inspection, the NRC inspectors determined that the conduit fittings for the two transmitters had been relocated above flood level.

(2) (Oper) Raychem Splices/Breakouts (50-327/86-01-15; 50-328/86-01-16)

No review of this item was performed during the inspection; therefore, it remains open.

Unresolved Item 50-327,328/86-42-02 from NRC inspection report 50-327,328/86-42, dated September 26, 1986 was reviewed and closed. This item is discussed in paragraph 4.B.

B. Equipment Installation and Maintenance

During previous NRC inspections of SQN concerns were raised regarding whether installation and maintenance activities on qualified equipment have been sufficiently controlled and/or verified by SQN to ensure that installed equipment is in accordance with qualification documentation. One concern pertained to whether past plant activities might have invalidated qualification of installed equipment. Also of concern was whether vendor requirements and recommendations for qualified equipment have been followed or adequate evaluations have been performed to justify not following them. Concerns with equipment installation and maintenance have been described in the following documents:

NRC Inspection Report Nos. 50-327,328/85-45, dated February 18, 1986

Letter from J. M. Taylor, Director, IE to S. A. White, Manager of Nuclear Power, TVA, dated July 31, 1986

NRC Inspection Report Nos. 50-327,328/86-01, dated August 15, 1986

NRC Inspection Report Nos. 50-327,328/86-42, dated September 26, 1986

Due to the concerns identified in the above documents relative to installation and maintenance of qualified equipment, this inspection focused on reviewing SQN's activities in these areas to determine the validity of the concerns.

The inspectors' review determined that the EQ Project (EQP) defines maintenance requirements for qualified equipment in Qualification Maintenance Data Sheets (QMDSs) which are located in Tab G of the respective qualification binders. The QMDSs specify the required maintenance to ensure continued qualification and list recommended maintenance and/or surveillance activities. The QMDSs are then reviewed by the plant to ensure that all requirements and recommendations are accounted for in plant maintenance and surveillance programs. Documentation of compliance with QMDS data is documented per Appendix C of procedure SQM 62, "10 CFR 50.49 Program, Qualification Maintenance Data Sheets Implementation."

The inspectors determined that verification of compliance with QMDS information is accomplished by review of work authorizations, maintenance records, modification records, physical inspection of equipment, and other documentation determined to be appropriate. It was further determined that QMDS requirements must be complied with or approval for noncompliance must be obtained from EQP. QMDS recommendations must be met or justification for not doing so must be documented. Approval from EQP for noncompliance with QMDS recommendations is not required.

Special installation requirements for qualified equipment are identified on field verification sheets developed by EQP and/or QMDSs. If field verification sheets are used then compliance with the requirements is documented by the plant in quality information releases (QIRs) which are reviewed and accepted by EQP. Compliance with installation requirements identified in the QMDSs is documented per Appendix C of SQM 62 as for maintenance requirements and recommendations.

The NRC inspectors evaluation of SQN's EQ program included reviews of: (1) vendor manuals to determine vendor requirements and recommendations for the equipment; (2) qualification binders to evaluate the adequacy of the QMDSs implementing vendor requirements and recommendations; (3) work authorizations and maintenance records to establish compliance with QMDSs; (4) procurement records; and (5) physical

inspection of installed equipment to determine SQN's compliance with installation requirements and preservation of the installed qualified configurations.

The inspectors selected 16 qualification binders and reviewed their associated installation and maintenance records. The 16 binders represent one-third of the equipment binders which were considered to be the most susceptible to installation and maintenance problems. Considerations for determining susceptibility included equipment complexity and/or whether the equipment was involved in other major SQN program verification activities which would identify installation and maintenance problems. Of the equipment selected, 11 transmitters selected from 4 equipment binders and 2 motors were selected for equipment walkdown.

Based on the documentation reviewed and the equipment, the inspectors identified no programmatic deficiencies in SQN's approach to assuring that as installed and as maintained environmentally qualified equipment is in accordance with qualification documentation. No equipment deficiencies were identified during the equipment walkdown.

While no programmatic deficiencies were identified, the inspectors determined that the "piece part" procurement violation identified in Inspection Report 50-327,328/86-61, dated November 14, 1986, affected environmentally qualified equipment. Since qualified equipment is affected, the EQ inspection team will follow the resolution of the "piece part" issue to ensure adequate resolution relative to qualified equipment prior to restart. Prime responsibility for resolution of the overall issue will remain with the inspection team identifying the violation.

(1) While the inspection team did not find any programmatic deficiencies, the inspectors made suggestions to SQN for improvements to the program. One suggestion dealt with the basis for establishing QMDS requirements and recommendations. Normal preventative maintenance (maintenance that would be performed regardless of whether the equipment was 10 CFR 50.49 qualified or not) on qualified equipment is not included in the QMDSs unless it has a direct effect on qualification. SQN stated that it was not intended that the QMDSs would drive the entire plant maintenance program.

Of particular concern to the inspectors was that paragraph 7. of inspection report 50-327,328/85-45 identified that administrative requirements make it easier to cancel preventative maintenance rather than defer it. The report further stated that late or cancelled preventative maintenance activities are normally only reviewed by the general foreman with regard to effect on equipment. It also stated that engineering evaluation is normally not accomplished and higher management review of late or cancelled preventative maintenance is minimal.

While the inspectors did not identify any specific problems with deferred or cancelled normal preventative maintenance on the equipment reviewed, the inspectors suggested that the maintenance program should have some means to ensure that any deferrals or cancelling of preventative maintenance on qualified equipment does not affect its qualified status.

(2) Another suggestion pertained to including in the EQ and/or maintenance program some means of evaluating the effect of abnormal operating occurences and/or changes in unit status, on the qualified life or qualification status of qualified equipment. The inspectors cited as an example that the qualified life of the residual heat removal (RHR) pumps was based on the assumption that they were operated approximately 727 hours per year; however, during the current extended outage they have been operating more than the assumed 727 hours. While SQN was able to satisfy the inspectors concerns for the RHR pumps, the inspectors suggested that SQN establish some methods of considering the effect of abnormal operating occurences and/or changes in unit status on the qualification of qualified equipment.

(3) During the inspectors' review of electric motor qualification binder MOT-1, the inspectors noted the following statement for "Essential Equipment Maintenance Requirements" on page G14 of the binder; "motor lubricant shall be a STO-2 lubricant procured in accordance with TVA specification 18.009. Different manufacturers lubricants shall not be mixed." This requirement was established so that lubricant trending analysis could be performed on the lubricant during the equipments' lifetime; thus, allowing evaluations of equipment condition based on analysis of the lubricant.

Since TVA procurement specification 18.009 does not prevent different manufacturers from supplying STO-2 lubricant and does not provide for the separation of STO-2 lubricants by manufacturers, the inspectors questioned the validity of the trending data. SQN stated that they had recently replaced the motor lubricant and they recorded the manufacturer of the lubricant; however, they acknowledged the problem with retaining lubricant identity throughout the equipments plant life and stated they were evaluating whether to retain the lubricant trending requirement. SQN also stated that a vibration check is run on the motors every quarter and this information along with other maintenance activities would provide information on motor condition during installation in the plant. The inspectors recommended that a decision be made regarding whether to use only one manufacturers lubricant in a motor and either eliminate the requirement or establish means to ensure a lubricant's manufacturer's identity.

The above suggestions for improvements in SQN's EQ and/or maintenance programs should be considered during future program revisions and are not considered necessary for restart.

Based on the results of the inspection, Open Item (50-327,328/86-01-05) concerning equipment maintenance history effects on qualified equipment is closed; however, future NRC inspections will evaluate this area for continued program implementation and compliance with NRC regulations over the life of the plant.

Open Item (50-327,328/86-42-02) concerning incorporation of vendor requirements in the EQ program was reviewed by the inspectors. Within the scope of the vendor documentation and SQN EQ documentation reviewed, the inspectors determined that appropriate vendor requirements, recommendations, and/or suggestions were being properly accounted for in the SQN EQ program. No deficiencies were identified and this item is considered closed. As in the case above, future NRC inspections will evaluate this area for continued program implementation and compliance with NRC regulations over the life of the plant.