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

50-206/85-30; 50-361/85-29; 50-362/85-28 Report No.: 50-206; 50-361; 50-362 Docket No.: DPR-13; NPF-10; NPF-15 License No.: Southern California Edison Company Licensee: 2244 Walnut Grove Ave. Rosemead, California 91770 San Onofre Nuclear Generating Station Units 1, 2, Facility Name: and 3 Inspection At: San Clemente, California Inspection Conducted: September 23 to 27, 1985

Inspector:

R. C. Wilson, Equipment Qualification & Test Engineer

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

- U. Potapovs, Chief, Equipment Qualification Inspection Section, I&E
- S. Alexander, Engineer, IE
- P. Shemanski, Senior Electrical Engineer, NRR
- R. O. Karsch, Reactor Engineer, NRR
- P. R. Bennett, Member of Technical Staff, Sandia National Laboratories
- R. A. Borgen, Consultant Engineer, Idaho National Engineering Laboratory
- M. Yost, Consultant Engineer, Idaho National Engineering Laboratory
- J. F. Burdoin, Peactor Engineer, RV
- T. M. Ross, Reactor Inspector, RV
- T. Young Jr., Section Chief, RV

Approved by:

8603100332

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U. Potapovs, Chief, Equipment Qualification Section Office of Inspection and Enforcement

INSPECTION SUMMARY

Inspection on September 23 to 27, 1985 (Inspection Report No. 50-206/85-30; 50-361/85-29; 50-362/85-28)

<u>Areas Inspected</u>: Special, announced inspection to review the licensee's implementation of a program per the requirements of 10 CFR 50.49 for establishing and maintaining the qualification of electric equipment within the scope of 10 CFR 50.49. The inspection also included evaluation of the implementation of a Condition Monitoring Program as required by a license condition for Units 2 and 3. The inspection involved 301 inspector hours onsite.

<u>Results</u>: The inspection determined that the licensee has implemented a program to meet the requirements of 10 CFR 50.49, except for certain deficiencies listed below. No deficiencies were found in the licensee's implementation of the Condition Monitoring program, but it is identified as an Open Item because additional action is required at a later date.

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Name	<u> </u>	Report Paragraph	Item Number(s)				
Potential Enforcement/Unresolved Items:							
1.	Galite cable	4.E.(1)	50-206/85-30-1; 50-361-85-29-1; 50-362/85-28-1				
2.	Rockbestos Firewall EP cable	4.E.(2)	50-206/85-30-2				
3.	Target Rock solenoid valve	4.E.(3)	50-206/85-30-3				
4	Honeywell E/P transducer	4.E.(4)	50-206/85-30-4				
5.	Rockbestos Firewall III cable	4.E.(5)	50-361/85-29-2; 50-362/85-28-2				
6.	ASCO solenoid valve	4.E.(6) 、	50-206/85-30-5				
7.	Replacement equipment procurement	4.A	50-206/85-30-6; 50-361/85-29-3; 50-362/85-28-3				
<u>Open</u>	Items:		· · ·				
1.	Completion of training		50-206/85-30-7; 50-361/85-29-4; 50-362/85-28-4				
2.	Condition Monitoring Program	4.C	50-361/85-29-5; 50-362/85-28-5				
3.	ASCO cable entrance	4.E.(7)	50-362/85-28-6				
4.	AFW pump motor	4.E.(8)	50-361/85-29-6				
5.	Motor duty limits	4.E.(8)	50-206/85-30-8; 50-361/85-29-7; 50-362/85-28-7				
6.	Cable entrance seals	4.E.(9)	50-206/85-30-9				

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1. PERSONS CONTACTED

1.1 Southern California Edison Company (SCE)

*K. P. Baskin, Vice President *B. Carlisle, Engineer, Nuclear Projects *J. L. Rainsberry, Supervisor, Unit 1 Licensing *J. M. Curran, Manager of QA *D. B. Schone, Site QA Manager *D. F. Pilmer, Manager, Nuclear Engineering *H. W. Morgan, Station Manager *R. N. Santosuosso, Assistant Maintenance Manager *S. K. Hunn, Corp. Doc. Mgt. Operations Supervisor *A. E. Dohna, Procurement Engineer *D. Gruber, Nuclear Training *N. Bloom, MTCE Engineering & Services *S. W. McMahan, Supervisor Maintenance Admin. *C. D. Coker, MTCE Engineer *R. L. Borden, QA Engineer *T. A. Mackey Jr., Supervisor Compliance *M. A. Wharton, Deputy Station Manager *H. W. Newton, Manager Material Support *M. P. Short, Unit 1 Project Manager *A. C. Llorens, Unit 1 Licensing *C. K. Balog, Principle Project Engineer *K. O. Connor, Project Startup Manager *D. E. Nunn, Manager of NGS *J. T. Reilly, Manager Station Tech. *H. B. Ray, Site Manager *J. R. Pfefferle, Compliance Engineer *B. Katz, Manager OMS *L. D. Brevig, Condition Monitoring Project Engineer *D. E. Shull Jr., Maintenance Manager *V. J. Salvatore, Compliance *C. R. Hover, Nuclear Engineering Safety and Licensing *G. T. Gibson, Supervisor, Compliance *D. Mercurio, Sr. Engineer, Licensing, Units 2 and 3 *D. Cox, Supervisor, Units 2 and 3 Licensing *R. W. Krieger, Operations Manager R. L. Phelps, Nuclear Engineering Safety and Licensing D. P. Breig, Project 2 and 3 W. G. Zinth, Manager Compliance D. D. Reiff, Compliance M. J. Speer, Compliance G. W. McDonald, QA Supervisor K. L. Baldwin, Procurement Engineering Supervisor W. M. Lazear, Maintenance/Outage QA Supervisor

D. C. Stonecipher, QC Manager

1.2 Impell Corp., Consultants

*V. Franceschi, Supervising Engineer *W. D. Fargo, EQ Engineer

1.3 Observers

*K. R. Wise, Tech. Prog. Ldr., Washington Public Power Supply System *R. K. Ho, EPM, Consultant to Nuclear Utility Group on EO

1.4 NRC

*R. Dudley, Unit 1 Project Manager

*H. Rood, Unit 2 and 3 Project

F. R. Huey, Senior Resident Inspector

*J. P. Stewart, Resident Inspector

*Denotes those present at exit meeting at San Onofre on September 27, 1985

2. PURPOSE

The purpose of this inspection was to review the licensee's implementation of the requirements of 10 CFR 50.49.

3. BACKGROUND

For San Onofre Nuclear Generating Station, Unit 1 (SONGS 1), the NRC held a meeting with SCE on December 20, 1983 to discuss SCE's proposed methods to resolve the EQ deficiencies identified in the November 30, 1982 SER and June 28, 1982 FRC TER. Discussions also included SCE's general methodology for compliance with 10 CFR 50.49 and justification for continued operation (JCO) for those equipment items for which environmental qualification was not completed. The minutes of the meeting and proposed method of resolution for each of the EQ deficiencies were documented in a July 30, 1984 submittal from the licensee. Since this submittal was inadequate to resolve the SONGS 1 EQ deficiencies an audit of the plant files was conducted from October 2 to 4, 1984; an additional meeting with the licensee was held on October 26, 1984; and SCE provided additional submittals on November 3 and November 19, 1984. The latter submittal states that all equipment on the 10 CFR 50.49 Master List is qualified except for certain equipment for which JCO's were submitted. The final SER, transmitted March 11, 1985 identified that certain equipment was still under JCO. A licensee submittal dated March 15, 1985, requested extension until November 30, 1985 (after this inspection) of the qualification deadline for two pump motors and ten actuators; the request was granted by NRC letter dated March 27, 1985.

SONGS 2 and 3 are NTOL plants and the EO review is documented in the Operating License SER, NUREG-0712 dated February 1981, together with Supplement 3 dated September 1981 and Supplement 4 dated January 1982. 1982 licensee submittals dated August 23, October 28, December 7, and December 21 addressed most of the items remaining open as of that time. Licensee letter dated February 28, 1985 stated that all SONGS 2 and 3 equipment within the scope of 10 CFR 50.49 was environmentally qualified except auxiliary feedwater (AFW) pump motors addressed by license conditions 2.C (25) for Unit 2 and 2.C (20) for Unit 3; consistent with the license conditions, SCE had installed lube oil cooling systems on both units by the time of the EQ inspection. License condition 2.C (5)c required affirmation of implementation of improved surveillance program procedures prior to startup following the first refueling outage. The August 23, 1982 SCE letter provided the required affirmation, which was conditionally accepted by NRC letter of August 30, 1982. This area was examined further during this inspection, and is addressed in section 4.C of this report under the heading "EQ Condition Monitoring Program."

4. FINDINGS

The NRC inspectors examined the licensee's program for establishing the qualification of electric equipment within the scope of 10 CFR 50.49. The program was evaluated by examination of the licensee's qualification

documentation files, review of procedures for controlling the licensee's EQ efforts, verification of adequacy and accuracy of the licensee's 10 CFR 50.49 equipment list, and examination of the licensee's program for maintaining the qualified status of the covered electrical equipment.

Based on the inspection findings, which are discussed in more detail below, the inspection team determined that the licensee has implemented a program to meet the requirements of 10 CFR 50.49 for SONGS 1, 2, and 3, although some deficiencies were identified.

A. EQ Program Procedures

The NRC inspectors reviewed the licensee's EQ program described in the Topical Quality Assurance Manual Chapter 1-I, "Environmental Qualification of Equipment" dated July 7, 1984. Additional program procedures reviewed for evaluating the licensee's implementation of a program for qualifying the electrical equipment at Units 1, 2, and 3 as required by 10 CFR 50.49 included:

K. P. Baskin letter, dated September 28, 1982 subject: "Electrical Equipment Environmental Qualification Program."

E&C 37-26-12, Rev. 3 dated September 12, 1985. "Development and Issuance of Revisions to The Master List of Electrical Equipment Requiring EQ and Located in Potentially Harsh Environments at SONGS 1, 2, and 3."

E&C 37-30-63, Rev. 4 dated September 5, 1985. "Development, Issuance, Revision and Cancellation of The Document Package to Establish The Environmental Qualification (EQ) of Electrical Equipment Listed on The EQ Master List for SONGS 1, 2, and 3."

S0123-I-1.7, Rev. O dated September 19, 1985. "Maintenance Order Preparation, Use and Scheduling."

S0123-I-1.31, Rev. O (TCN 0-1), dated March 3, 1985. "EQ-Environmental Qualification Maintenance Information Evaluation and Processing."

S0123-V-5.10, Rev. 1, (TCN 1-7), dated March 15, 1984. "Temporary Facility Modifications."

S0123-V-4.20, Rev. 1 (TCN 1-10) dated November 28, 1983. "Preparation and Revision of Drawings."

SO123-XV-5.0, Rev. 0 (TCN 0-3), dated December 1, 1984. "Nonconforming Materials, Parts or Components."

S0123-V-5.11, Rev. O (TCN 0-2), dated May 14, 1984. "Station Engineering Review of Preliminary Design Change Packages." S0123-V-4.14, Rev. 5 (TCN 5-8), dated May 14, 1984. "Proposed Facility Changes."

S0123-XI-2.0, Rev. 1, (TCN 1-7), dated May 17, 1984. "Procurement Document Control."

S0123-XI-2.5, Rev. O, dated April 13, 1984. "Substitution Part Equivalency Evaluation Report."

SO123-XVII-10.0, Rev. 0 (TCN 0-2) dated October 2, 1984. "Data Management for Installed Components."

The licensee's program was reviewed to verify that adequate procedures and controls had been established to meet the requirements of 10 CFR 50.49. Areas of the program reviewed included methods and their effectiveness for:

- (a) Requiring all equipment that is located in harsh environments and is within the scope of 10 CFR 50.49 to be included on the list of equipment requiring gualification (EQ Master List).
- (b) Controlling the generation, maintenance, and distribution of the EQ Master List.
- (c) Defining and differentiating between mild and harsh environments.
- (d) Establishing harsh environmental conditions at the location of equipment through engineering analysis and evaluation.
- (e) Establishing and maintaining a file of plant conditions.
- (f) Establishing, evaluating, and maintaining EQ documentation.
- (g) Training personnel in the environmental qualification of equipment.
- (h) Controlling plant modifications such as installation of new and replacement equipment, and providing for updating replacement equipment to 10 CFR 50.49 criteria.

As part of the program review the inspectors examined records and met with personnel of the following groups:

- (a) Maintenance/Outage Quality Assurance
- (b) Site Quality Control
- (c) Program Audit and Assessment
- (d) Nuclear Training Division
- (e) Nuclear Engineering Safety and Licensing
- (f) Procurement Engineering
- (g) Procurement (Material Support)

From review of audit records, it is concluded that audits of the EQ program had been conducted or were in process in the following areas:

- (a) Procurement Engineering
- (b) The Master List
- (c) Maintenance
- (d) Storage and Warehouse
- (e) Procurement Procedures

The inspectors examined in detail the degree and effectiveness of QA involvement to verify maintenance department compliance with 10 CFR 50.49 and QA program requirements. During this year and last, the QA organization has conducted at least three comprehensive audits, and several functionally specific audits, of the site EQ program. Review of these audits and interviews with QA management and staff revealed an active QA involvement during development and initial implementation of the EQ program; especially in the functional areas of maintenance, configuration control, and nuclear engineering (i.e. EQ Master List). Significant program (i.e. procedure) and implementation findings were documented in these audits. Deficiency reports were issued to the responsible organizations and corrective actions were followed-up. Response to QA findings has resulted in substantial improvements of the EQ program, particularly as related to maintenance.

Review of procurement practices showed a well-documented program that had included EQ requirements for approximately two years. One deficiency was identified, however, relating to procurement of qualified replacement equipment. SONGS 1 is a DOR Guidelines plant, and SONGS 2 and 3 were licensed to NUREG 0588 Category II. Contrary to paragraph (1) of 10 CFR 50.49, which requires that qualified replacement equipment must be qualified to section 50.49 in the absence of sound reason to the contrary, procedure SO123-XI-2.0 calls for like-for-like replacement using the Master Equipment List as the source of model numbers. Although Nuclear Engineering (NE) was aware of the need to upgrade, NE is not part of the normal procurement path. Replacement equipment procurement constitutes Potential Enforcement/Unresolved Item 50-206/85-30-6; 50-361/85-29-3; 50-362/85-28-3.

Review of training records revealed a weakness in this area. There was no evidence of formal training or indoctrination for the EQ program in the Site Quality Control or The Maintenance/Outage Quality Control Groups. There were limited records to indicate that a formal training program had been implemented by the Nuclear Training Division to emphasize or stress the importance of the EQ program and requirements. At the same time, the Procurement Engineering Group had put together a thirty minute film strip on the various aspects of the EQ program which they used to indoctrinate and acquaint their people with the various aspects of the program. This item remains open and will be followed up during a future inspection. Completion of training constitutes Open Item 50-206/85-30-7; 50-361/85-29-4; 50-362/85-28-4. It is concluded, with the exception of the two items above, that the EQ program is well planned and documented, and has been properly implemented as required by 10 CFR 50.49.

B. EQ Maintenance Program

Implementation of the EQ maintenance program was inspected to assess the licensee's capability for preserving the qualified status of electrical equipment defined by 10 CFR 50.49. The inspectors reviewed records of completed maintenance orders, EQ maintenance information evaluation review transmittal packages, and QA audits of EQ maintenance. Additionally, NRC inspectors interviewed responsible maintenance management and engineering plant staff, and examined the application of EQ requirements by the computerized San Onofre Maintenance Management System (SOMMS) used for controlling corrective and repetitive maintenance activities. Maintenance orders, transmittal packages, and SOMMS files were selected from those electrical components previously chosen for EQ document package review and physical walkdown inspection.

The EQ document package for each applicable electrical component item contains EQ Equipment Maintenance Information Sheets providing information concerning equipment identification, age-related requirements, and manufacturer's recommendations for preventive maintenance. Procedural guidance to process and evaluate this information for inclusion into the regular repetitive maintenance schedule of an electrical component, is prescribed by procedure S0123-I-1.31. In accordance with this procedure the Maintenance Administrative Support (MAS) organization has responsibility for review, evaluation and approval of EO equipment and maintenance information. MAS also assures that acceptable information is transmitted to the various support groups for incorporation into SOMMS, the Plant Equipment Data Management System (PEDMS), and the spare parts program. PEDMS is a technically descriptive equipment data base incorporating the Master Equipment List and coordinated with SOMMS.

SOMMS is an extensive computer-based maintenance management system containing component data; maintenance schedules; stores inventory quantities; records of maintenance performed (procedures and dates); QA, seismic, fire protection, and EQ status; and similar information. SOMMS is used for on-line maintenance order initiation, maintenance planning and tracking, review and approval, hard copy reporting, and several other functions. The inspectors observed a complete procedure for replacing limited-life components of a Namco limit switch as an example of the comprehensiveness of the SOMMS system. SOMMS and PEDMS are modules of the Plant and Equipment Systems computer system, which has over 400 terminals at the station. The system is in place and is being used routinely; SONGS 2 and 3 were implemented in SOMMS in July 1983 and SONGS 1 in June 1985.

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The inspectors verified that equipment and maintenance information contained in selected EQ document packages was accurately represented within the SOMMS and PEDMS. Documented maintenance engineering evaluation reviews appeared to completely address all identified EQ package maintenance information. Exceptions and modification of the delineated EQ package maintenance requirements were also acceptably documented. All maintenance information evaluation review packages reviewed by inspectors were appropriately approved. Routing of the original EQ package for evaluation review and subsequent transmittal of maintenance information appeared to be adequately tracked by flow travelers, and transmittal and cover sheets all in accordance with SO123-I-1.31. Furthermore, discussions with responsible maintenance supervisors and engineers revealed that they clearly understood the methodology for processing and evaluating EQ maintenance information as prescribed in SO123-I-1.31.

Completed corrective and preventive maintenance orders for selected electrical equipment were requested from the licensee's Corporate Documentation Management (CDM) system used for retention of historical records. Maintenance order preparation, use and scheduling is controlled by station procedure SO123-I-1.7. Review of maintenance order records and observation of licensee demonstrations on the use of SOMMS assured the inspectors that actual maintenance activities affecting EQ electrical components were being acceptably conducted. The SONGS EQ Maintenance Program appears to be well planned and implemented.

C. EQ Condition Monitoring (EQCM) Program

License condition 2.C(5)c for Units 2/3 requires, "Prior to startup following the first refueling outage, SCE shall provide affirmation of implementation of the improved surveillance program procedures." Accordingly, a program to monitor the condition of EQ electrical equipment was established by station procedure S0123-I-1.32. This procedure defined responsibilities and provided instructions for evaluation of EQ equipment performance, including comparison of actual field degradation to the laboratory-predicted lifetimes. Concurrent with the EQCM program the licensee has established an "Environmental Data Acquisition" support activity to be used for formulating environmental baselines of selected plant areas. This will assure that actual environmental conditions are compatible with expected conditions on which projected electrical equipment lifetimes were based. Special Operation and Maintenance Support (0&MS) procedure S123-SPOMS-4 provides the guidance for collecting environmental data (e.g., temperature, humidity, radiation). Condition monitoring requirements are identified (e.g., component parameter, surveillance technique, acceptance criteria, frequency) in each electrical component EQ document package. The frequency of surveillance for condition monitoring has been established as every refueling cycle. Environmental conditions are also identified in the EQ document package.

The site EQCM program has not been fully implemented at this time. Unit 3 has not completed the first refueling outage, and Unit 2 will not be collecting the first significant data points until the next (i.e., the second) refueling outage. Thus there is no condition monitoring information available on which to perform trending analyses. Furthermore, environmental data acquisition cannot effectively commence until required temporary temperature, humidity, and radiation devices have been put in place.

NRC inspectors reviewed both of the aforementioned program procedures and conducted interviews with responsible O&MS and station technical engineers. Although these procedures have sufficient guidance to initially establish both programs, it would appear that future implementation of the EQCM program would benefit from additional instructions on delegation of fact finding and trending responsibilities, and on the methodology of processing and evaluating EQCM requirements delineated in the EQ package. Further, although procedure S0123-I-1.32 assigns primary responsibility of the EQCM program to the Maintenance Administrative Support supervisor, this responsibility appears to have been transferred to a project engineer in the O&MS department. At the time of this inspection, the O&MS engineer was occupied with development and implementation of both programs and intends to substantially revise the EQCM procedure.

As neither the EQCM or Environmental Data Acquisition programs were in a stage of full implementation at the time of the NRC team inspection, this item remains open and will be followed up in a future inspection. Condition Monitoring Program constitutes Open Item 50-361/85-29-5; 50-362/85-28-5.

D. EQ Master List

The licensee is required to maintain an up-to-date list of the equipment that must be qualified under 10 CFR 50.49. This list is entititled "Corporate Documentation Management (CDM) Document No. M85003" for Unit 1 and "CDM Document No. M37582" for Units 2 and 3. Considered in the preparation of these lists are the environmental effects resulting from all of the postulated design-basis accidents documented in the licensee's Final Safety Analysis Reports, Technical Specification limiting conditions of operations, emergency operating procedures, piping and instrumentation diagrams, and electrical distribution diagrams.

The methodology used in producing the EQ Master List for Unit 1 is detailed in submittals by the Ticensee dated May 20, 1983 and November 19, 1984. The EQ Master List for Units 2 and 3 was submitted and reviewed as part of the Ticensing process. This review is detailed in the Safety Evaluation Report, NUREG-0712, Supplement 3, Appendix B, dated September 1981. Two procedures are presently under development which will be used to maintain the EQ Master Lists for all three units. These procedures are Interim OA Procedure E&C 37-26-12, Revision 3 dated September 12, 1985, "Development and Issuance of Revisions to the Master List of Electrical Equipment Requiring Environmental Qualification and Located in Potentially Harsh Environments at SONGS 1, 2, and 3" and Interim QA Procedure E&C 37-30-63, Revision 4 dated September 5, 1985, "Development, Issuance, Revision and Cancellation of the Document Package to Establish the Environmental Qualification (EQ) of Electrical Equipment Listed on the EQ Master List for SONGS 1, 2, and 3." These procedures were reviewed and determined to be generally adequate for their intended purpose.

Twelve items were used as an audit sample to verify the completeness of the current EO Master List for Unit 1 and eight items were used for Units 2 and 3. In order to compile this audit sample, the following piping and instrumentation drawings (P&IDs) and emergency procedures were reviewed.

Emergency Procedures

Unit 1

- S 01-1.0-10, Rev. 1 dated November 22, 1984, "Reactor Trip or Safety Injection."
- S 01-1.0-20, Rev. 1 dated November 21, 1984, "Loss of Reactor Coolant."
- S 01-1.0-23, Rev. 1 dated November 21, 1984, "Transfer to Cold Leg Injection and Recirculation."
- S 01-1.0-32, Rev. 1 dated November 21, 1984, "Loss of RHR Due to Loss of Secondary Coolant in Containment."
- S 01-1.5-2, Rev. 4 dated November 21, 1984, "Response to High Containment Sump Level."
- S 01-1.5-3, Rev. 3 dated November 21, 1984, "Response to High Containment Radiation Level."

Units 2 and 3

- S 023-12-1, Rev. O dated February 26, 1985, "Standard Post Trip Actions."
- S 023-12-2, Rev. O dated February 26, 1985, "Reactor Trip Recovery."
- S 023-12-3, Rev. O dated February 26, 1985, "Loss of Coolant Accident."
- S 023-12-4, Rev. O dated February 26, 1985, "Steam Generator Tube Rupture."

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- S 023-12-12, Rev. O dated February 26, 1985, "Heat Removal - Priority 4."
- S 023-12-13, Rev. O dated February 26, 1985, "Containment Isolation Priority 5."

P&IDs

Unit 1

5178105-4, Pressurizer and Pressurizer Relief Tank.

5178100-3, Reactor Coolant System Sheet 1.

5178101-0, Reactor Coolant System Sheet 2.

5178115-4, Safety Injection System.

5153166-3, Containment Spray and SIS Recirculation System Flow Diagram.

5178120-4, Containment Spray and Recirculation System Sheet 1.

5178121-3, Containment Spray and Recirculation System Sheet 2.

5178130-3, Letdown and Residual Heat Removal System.

5178039-0, ISI Class. Boundary Drawing Feedwater System Sheet 1.

5178310-4, Component Cooling Water System Sheet 1.

5178125-1, Containment Spray Hydrazine Additive System.

5178220-3, Auxiliary Feedwater System Sheet 1.

5178221-2, Auxiliary Feedwater System Sheet 2.

Units 2 and 3

40111B-4, Reactor Cooling System, Syst. #1201, Unit 2 only.

40111A-4, Reactor Coolant Systems, Syst. #1201, Unit 2 only.

40111X-0, Process Key Plan Reactor Coolant System, System #1201.

40170A-6, Containment HVAC System, System #1501.

40160A-5, Auxiliary Feedwater System, System #1305.

41041A-4, Main Steam System, System #1301.

40134A-3, Nuclear Plant Sampling, System #1212.

40127F-6, Component Cooling Water System, System #1203.

401480-5, Blowdown Processing System, System #1318.

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The audit sample was selected to verify that those items required to be on the list are in fact on the list. The sample also included four items required for implementation of the TMI improvement plan and R. G. 1.97 (Valve Position Indication per II.D.3, Radiation Monitors, Containment H₂ Monitor). All sample items required to be on the EQ Master List were in fact on the list. To test the thoroughness of the licensee's review certain items were included in the audit sample which should not appear on the list. The licensee's judgement and reasoning were tested by these items. During this inspection the items not required to be on the EQ Master List were in fact not on the list and satisfactory explanations for their omission were provided. Based on this review the licensee's EQ Master Lists for Units 1, 2, and 3 are considered satisfactory.

E. Environmental Qualification Files

The SONGS Master Lists show the applicable EQ Document Package number and revision for every component on each list. As with the Master Lists, SONGS 1 has a set of documentation and SONGS 2 and 3 share a second set. Each EQ document package is headed by a ten-page summary identifying the equipment, references, qualification synopsis, and conclusions, together with appropriate signatures. At least one EQ Equipment Maintenance Information Sheet is included. Excerpts from significant references such as System Component Evaluation Work Sheets (SCEW sheets), environmental profiles, test reports, analyses, and product information reports are included as attachments for the convenience of the user, although the references themselves are separately maintained in the files. The inspectors found that the files present necessary information in a convenient, easily auditable format without being excessively elaborate.

The NRC inspectors examined files for 12 equipment items in SONGS 1 and 11 items in SONGS 2 and 3, where an item is defined as a specific type of electrical equipment, designated by manufacturer and model, which is representative of all identical equipment in a plant area exposed to the same environmental service conditions. The items were selected in advance by the inspection team and identified to the licensee during the entrance meeting.

The files were examined to verify the qualified status of equipment within the scope of 10 CFR 50.49. In addition to comparing plant service conditions with qualification test conditions and verifying the bases for these conditions, the inspectors selectively reviewed areas such as required post-accident operating time compared to the duration of time the equipment has been demonstrated to be qualified; similarity of tested equipment to that installed in the plant (e.g., insulation class, materials of components of the equipment, tested configuration compared to installed configuration, and documentation of both); evaluation of adequacy of test conditions; aging calculations for qualified life and replacement interval determination; effects of decreases in insulation resistance on equipment performance; adequacy of demonstrated accuracy; evaluation of test anomalies; and applicability of EQ problems reported in IE INs/Bulletins and their resolution.

The files adequately documented qualification of the equipment except as described below. The files were auditable and with the exceptions described below were complete and accurate. No generic documentation deficiencies were found.

- Galite Thermocouple Extension Cable, EQ Document Packages (1)M38289 (SONGS 1) and M37607 Rev. 1 (SONGS 2 and 3) - The installed cable was manufactured by Galite, but the test report was based on cable manufactured by Prestolite Wire and Cable Similarity of the insulating material was established: Co. both cables use HALAR 300, an E-CTFE fluoropolymer with bulk properties suitable for the application based on Allied Chemical data and Franklin Research Center test report F-C3906 dated July 1974. The licensee was unable to demonstrate during the inspection that the processes for applying the insulation to the conductors were sufficiently similar to complete documentation of qualification to the DOR Guidelines for SONGS 1 and NUREG 0588 Cat. II for SONGS 2 and 3. Galite cable comprises Potential Enforcement/Unresolved Item 50-206/85-30-1; 50-361/85-29-1; 50-362/85-28-1.
- (2) Rockbestos Firewall EP cable, EQ Document Package M38285 (SONGS 1) - Qualification was based on Rockbestos report QR#1804, which is discredited by IE Information Notice 84-44; although IN 84-44 was included in the Document Package, no other test reports or evaluations were used to support qualification. Whereas some credit can be given for QR#1804 against DOR Guidelines, the Document Package claimed qualification to 10 CFR 50.49 and no credit can be given in that case. Rockbestos Firewall EP cable comprises Potential Enforcement/Unresolved Item 50-206/85-30-2.
- (3) Target Rock solenoid valve, plant tag no. SV 119, EQ Document Package M38301 (SONGS 1) - The plant physical inspection revealed that this valve is normally energized, and thus normally much hotter than if de-energized because of self-heating. The qualified life calculation in the Document Package was erroneously based on normally de-energized operation and thus was highly optimistic. Preliminary recalculation showed that the correct life is about five years. Since the component was installed in 1981 it was still within its qualified life. The Document Package, including the EQ Equipment Maintenance Information Sheets, requires correction to reflect corrected operating conditions and life calculation. Target Rock solenoid valve comprises Potential Enforcement/ Unresolved Item 50-206/85-30-3.

- (4)
- Honeywell E/P transducer, plant tag no. FCV 1115D, EQ Document Package M38308 rev. 1 (SONGS 1) - Qualfication for a 212 F environment was based solely on analysis, although section 5.1 of the DOR Guidelines requires a test for severe pressure, temperature, and steam service conditions. After re-examining the use of this transducer the licensee concluded that it is used only for LOCA mitigation; thus, in its reactor building location the only harsh environment the transducer must be qualified for is radiation, which is adequately addressed in the file. Honeywell E/P transducer constitutes Potential Enforcement/ Unresolved Item 50-206/85-30-4.
- (5) Rockbestos Firewall III cable (with or without KXL420 rework or factory splices), EQ Document Package M37627 rev. 1 (SONGS 2 and 3) - Qualification was based on Rockbestos report OR#1803. Although the file stated that the type testing was conducted under Bechtel's Quality Assurance Program, there was no objective evidence that the test had appropriate quality control and was free of the problems identified in IE IN 84-44, and the report dates from the same time period as reports specifically cited in IE IN 84-44. The IN was included in the file, and no other test reports were used to support qualification. A second problem relates to the fact that the test cables were simply energized during the type test, and not otherwise evaluated. This is contrary to criteria in documents to which the file claimed qualification: (a) NUREG 0588 Cat. II section 2.2.(7) requires verification of performance characteristics throughout the range of required operability; (b) NUREG 0588 Cat. II section 2.1.(1) invokes the qualification method criteria of IEEE 323-71 which states in section 5.2.3.4 that the type test data shall contain the static and dynamic performance characteristics; (c) IEEE 323-74 section 6.3.2.(6) states that those functions which must be performed during the design basis event shall be monitored. Rockbestos Firewall III cable comprises Potential Enforcement/Unresolved Item 50-361/85-29-2; 50-362/85-28-2.
- (6) ASCO solenoid valve, plant tag. no. SV 3201, EQ Document Package M38292 rev. 1 (SONGS 1) - During the plant physical inspection this valve, located in the turbine building and exposed to outside air, was found to be covered with heavy rust to the extent that the integrity of the coil housing could not be established. Prior to the exit meeting the licensee initiated a Site Problem Report and an Engineering Evaluation, with a seven day deadline scheduled for the latter. This item is considered unresolved pending review of the results of the Engineering Evaluation. ASCO solenoid valve comprises Potential Enforcement/Unresolved Item 50-206/85-30-5.
- (7) ASCO solenoid valve, plant tag no. 3HY-9823-1, EQ Document Package M37703 (SONGS 3) - The EQ Equipment Maintenance Information Sheet listed this valve along with others subject to a pressurized moisture environment and thus requiring

sealing of the cable entrance. During the plant physical inspection no cable entrance seal was observed. Design Change Package No. 3-6419.0E dated April 2, 1985 covered installation of a Conax seal but had not yet been implemented. When questioned, the licensee stated that this solenoid valve, which controls an air-operated containment purge/isolation valve, need only be de-energized to perform its safety-related isolation function. Since moisture intrusion at the cable entrance cannot affect that function, the inspectors agree that a cable entrance seal is not required for EQ purposes, even though installing the seal may be good engineering practice. A future NRC inspection will verify that the EQ file is revised to clarify that a seal is not required. ASCO cable entrance comprises Open Item 50-362/85-28-6.

- Siemens-Allis Auxiliary Feedwater (AFW) Pump Motors, plant tag (8) nos. P141 and P504, EQ Document Package M37632 (SONGS 2) - Several concerns were identified during the plant physical inspection of the SONGS 2 AFW pump motors. (a) AFW pump motor P141 had the wrong station equipment identification tag number; instead of S21305MP141 it was incorrectly labelled S31305MP504. This concern did not appear to be widespread, and the correct tag was quickly installed by the licensee, so the concern is closed. (b) The pump support skids around both motors exhibited excessive oil spillage, possibly due to recent installation of a gravity feed lube oil cooling system under license condition 2.C(25). Although no specific open item is being written in this regard, the NRC resident inspectors will monitor such housekeeping practices during the normal course of routine operational verifications. (c) Pump motor P504 exhibited an Allis-Chalmers manufacturer's label, although the EQ Document Package identified Siemens-Allis as the manufacturer. A future NRC inspection will verify that this discrepancy is resolved. AFW Pump Motor comprises Open Item 50-361/85-29-6. (d) Permissible pump start duty limits stated on the pump motors and in the EQ file were not specified in the station operating instructions. For the AFW pumps this was corrected by prompt licensee revision of Operating Instruction S023-2-4, "Auxiliary Feedwater System Operation." Generically, the station staff initiated an investigation to ensure that all safety-related pump motor start duty limits are adequately addressed in station operating instructions. A future NRC inspection will review the implementation of the results of the study. Motor duty limits comprises Open Item 50-206/85-30-8; 50-361/85-29-7; 50-362/85-28-7.
- (9) Cable entrance seals for the following SONGS 1 components: ASCO solenoid valve, plant tag no. SV 3201, EQ Document Package M38292 rev. 1; NAMCO limit switches ZSC 3201/ZSO 3201, EQ Document Package M38301 - For each of these components the EQ Equipment Maintenance Information Sheet specified that the

conduit connection must be sealed to protect the component interior from a pressurized moisture environment. The seal requirement was applied to lists of components including the ones identified above. The plant physical inspection revealed that none of the three components identified above had a cable entrance seal. The licensee explained that none of these components was subject to a pressurized moisture environment (although other components on the same lists were so exposed), and the seal requirement had been intended to apply only where the environment identified in a separate table in the EQ Document Package requires. The inspectors agreed that the licensee's justification for not requiring cable entrance seals on these three components was acceptable, but the files -particularly the EQ Equipment Maintenance Information Sheets -do not clearly specify whether or not a specific component requires a seal. A future NRC inspection will verify that the EO Document Packages identified above have been revised to clarify the need for seals. This problem appears to be limited to SONGS 1. Cable entrance seals comprise Open Item 50-206/85-30-9.

(10) IE Information Notices and Bulletins - The NRC inspectors reviewed and evaluated the licensee's activities related to the review of EQ-related IE Information Notices/Bulletins. The inspectors' review included examination of SCE's procedures and EQ documentation packages relative to 12 Information Notices and one Bulletin. The procedures review determined that the licensee does have a system for distributing, reviewing, and evaluating Information Notices/Bulletins relative to equipment within the scope of 10 CFR 50.49. During the review of individual component qualification files the NRC inspectors evaluated the licensee's actions with respect to Information Notices/Bulletins. No concerns were identified during this review except as described in section 4.E of this report with respect to IE IN 84-44.

F. PLANT PHYSICAL INSPECTION

The NRC inspectors, with component accessibility input from licensee personnel, established a list of seven components types in SONGS 1 and nine in SONGS 2 and 3 for physical inspection. All were accessible at the time of inspection. The inspectors examined characteristics such as mounting configuration, orientation, interfaces, model number, ambient environment, and physical condition. Two concerns were identified during the physical inspection, involving an ASCO solenoid valve in SONGS 1 (see section 4.E.(5) of this report) and the AFW pump motors in SONGS 2 and 3 (see section 4.E.(8)). These concerns involved questionable maintenance, but both were considered to be isolated events not symptomatic of program breakdown. The solenoid valve was the only rusty component observed; limit switches located within a few feet of the valve, for example, displayed no visible degradation. Two other motors were examined and found to be well-maintained and in good condition; the AFW pump motor oil spillage problem appeared to be related to recent modifications of the lube oil system for those pumps.

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INPUT FOR NOTICE OF VIOLATION, 50-206/85-30; 50-361/85-29; 50-362/85-28

A. Paragraph (j) of 10 CFR 50.49 requires that a record of qualification must be maintained to permit verification that each item is qualified for its application and meets its specified performance requirements when subjected to the conditions predicted to be present when it must perform its safety function up to the end of its qualified life.

Paragraph (k) of 10 CFR 50.49 states that equipment previously required by the Commission to be qualified to the "Guidelines for Evaluating Environmental Qualification for Class 1E Electrical Equipment in Operating Reactors" or NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment" need not be requalified.

- 1. Section 5.2.2 of the Guidelines states that the type test is only valid for equipment identical in design and material construction to the test specimen, and any deviations should be evaluated as part of the documentation. (Applicable to Unit 1)
- Section 5(1) of NUREG-0588 (Cat. I and II) states that the basis of qualification shall show the relationship of all facets of proof needed to support adequacy of the complete equipment. (Applicable to Units 2 and 3)

Contrary to the above, for Galite thermocouple extension cable the files did not establish similarity between the plant equipment and test specimen; specifically, the processes for applying insulation to the conductors were not shown to be similar.

This is a Severity Level IV violation (Supplement I).

B. Paragraph (j) of 10 CFR 50.49 requires that a record of qualification must be maintained to permit verification that each item is qualified for its application and meets its specified performance requirements when subjected to the conditions predicted to be present when it must perform its safety function up to the end of its qualified life.

Contrary to the above, for Rockbestos Firewall EP cable the files did not adequately support claimed qualification to 10 CFR 50.49; specifically, the test report relied on for qualification was incomplete and inadequate.

This is a Severity Level IV violation (Supplement I).

C. Paragraph (j) of 10 CFR 50.49 requires that a record of qualification must be maintained to permit verification that each item is qualified for its application and meets its specified performance requirements when subjected to the conditions predicted to be present when it must perform its safety function up to the end of its qualified life. Paragraph (k) of 10 CFR 50.49 states that equipment previously required by the Commission to be qualified to the "Guidelines for Evaluating Environmental Qualification for Class 1E Electrical Equipment in Operating Reactors" need not be requalified.

Section 5.2.5 of the Guidelines states that operational modes tested shall be representative of the actual application requirements; components which operate normally energized in the plant should be normally energized during the tests.

Contrary to the above, for Target Rock solenoid valve SV 119, the files did not determine qualified life based on normal energization; instead life was determined without consideration for self heating effects that substantially reduce the life.

This is a Severity Level IV violation (Supplement I).

D. Paragraph (j) of 10 CFR 50.49 requires that a record of qualification must be maintained to permit verification that each item is qualified for its application and meets its specified performance requirements when subjected to the conditions predicted to be present when it must perform its safety function.

Paragraph (k) of 10 CFR 50.49 states that equipment previously required by the Commission to be qualified to the "Guidelines for Evaluating Environmental Qualification for Class 1E Electrical Equipment in Operating Reactors" need not be requalified.

Section 5.1 of the Guidelines requires that as a minimum the qualification for severe temperature, pressure, and steam service conditions should be based on type testing.

Contrary to the above, for Honeywell E/P transducer FCV 1115D qualification for a steam environment was based entirely on analysis with no type test.

This is a Severity Level IV violation (Supplement I).

E. Paragraph (j) of 10 CFR 50.49 requires that a record of qualification must be maintained to permit verification that each item is qualified for its application and meets its specified performance requirements when subjected to the conditions predicted to be present when it must perform its safety function.

Paragraph (k) of 10 CFR 50.49 states that equipment previously required by the Commission to be qualified to NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment" need not be requalified.

Section 2.2(7) of NUREG-0588 Cat. II states that performance characteristics should be verified during testing throughout the range of required operability.

Section 2.1(1) of NUREG-0588 Cat. II invokes the qualification method criteria of IEEE Standard 323-1971, which states in Section 5.2.3.4 that the type test data shall contain the static and dynamic performance characteristics.

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Contrary to the above, for Rockbestos Firewall III cable:

- 1. The files did not adequately support claimed qualification to 10 CFR 50.49; specifically, the test report relied on for qualification was incomplete and inadequate.
- 2. The files did not contain test data relevant to the required operating performance characteristics in the plant.

This is a Severity Level IV violation (Supplement I).

