OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF REACTOR INSPECTION AND SAFEGUARDS

Report Nos.: 50-206/87-02, 50-361/87-03, and 50-362/87-04

Docket Nos.: 50-206, 50-361, and 50-362

Licensee Nos.: DPR-13, NPF-10, NPF-15

Licensee: Southern California Edison Company
2244 Walnut Grove Avenue
P. O. Box 800
Rosemead, California 91770

Facility Name: San Onofre Nuclear Generating Station, Units 1, 2, and 3

Inspection At: San Onofre, San Clemente, California

Inspection Conducted: February 2-13 and March 2-6, 1987

Inspectors: Edward T Baker — Edward T. Baker, Team Leader — 5/13/87 Date

E.T. Baker for — Jeffrey B. Jacobson, Electrical Engineer — 5/13/87 Date

E.T. Baker for — Richard P. McIntyre — 5/13/87 Date

E.T. Baker for — Peter Prescott — 5/13/87 Date

E.T. Baker for — Edouard Trottier — 5/13/87 Date

Approved By: — Ellis W. Merschoff, Acting Chief
Vendor Inspection Branch — 5/14/87 Date

Summary

Inspection during the period February 2-13 and March 2-6, 1987 (Report Nos. 50-206/87-02, 50-361/87-03, and 50-362/87-04).

Areas Inspected: Five inspectors from the Office of Inspection and Enforcement conducted an announced inspection at the San Onofre Nuclear Generating Station Units 1, 2, and 3. The inspection included reviews of San Onofre's procurement, vendor interface, and 10 CFR Part 21 programs as well as a review of specific vendor related technical issues.

Results: Of the areas inspected, two potential enforcement findings of NRC requirements were identified. The first potential enforcement finding pertained to the acquisition of a commerical grade circuit breaker which was installed in a safety-related, Class 1E application (paragraph 2.B). The second potential enforcement finding concerned classifying certain butt splice connector terminals as qualified without adequate justification [paragraph 3.D.(5)].

Details:

1. Persons Contacted

Southern California Edison Company

*W. Kirby, QA Supervisor
*J. Rivas, QA Supervisor
*M. Ensminger, QC Supervisor
*M. E. Rodin, Operations and Maintenance Supervisor
*D. A. Herbet, ISEG Supervisor
*N. Maringas, ISEG Engineer
*R. Maisel, Compliance Engineer
*G. D. Bogosian, QA Engineer
*D. C. Stoneciphen, QC Manager
*N. R. Dickinson, Technical Service Supervisor
*R. M. Bockhorst, Electrical and Control
*R. D. Plappert, Compliance
*W. M. Lazear, QA Supervisor
*J. Patterson, Maintenance
*M. Speer, Compliance
*D. Pilmer, Supervisor, Nuclear Safety
*G. Gibson, Compliance Engineer
*C. A. Couser, Compliance Engineer
*H. E. Morgan, Station Manager
*M. A. Wharton, DSM
*D. H. Peacor, Manager, Station Emergency Preparedness
*K. Baldwin, Supervisory Procurement Engineer
*H. W. Newton, Manager, Material Supply
*J. J. Wambold, Project Manager
*W. G. Zintl, Manager, Compliance
*B. Katz, Manager, OMS
*D. B. Schone, Site QA Manager

Nuclear Regulatory Commission

*A. E. Chaffee
*F. R. Huey

*Denotes those attending the exit meeting on February 6, 1987.

2. Procurement of Material

A. Procedure Review

(1) All safety related equipment purchased by San Onofre is procured in accordance with a material control procedure SO123-XI-2.1, "The Five Level Procurement System." The five levels of

procurement are described in the following paragraphs along with a table showing procurement level requirements.

The Level I, "Specification Method", classification of procurement is used for equipment where a very high degree of confidence is required, such as items which are part of or whose failure would violate the reactor coolant pressure boundary. This level of procurement requires the use of a procurement specification and requires that the vendor be qualified from a quality assurance aspect. Items procured Level I may be accepted based upon a source inspection, a receipt inspection, or a supplier certificate of conformance. Procurement Level II, "Replacement In-Kind Method", is similar to Level I except that original rather than newly generated specifications are referenced in procurement documents and Level II is for procuring less critical items.

Equipment purchased in accordance with procurement Level III, "Verification Method", must be simple, inspectable parts whose critical characteristics can be verified at the source or after receipt through inspection and/or testing by an SCE appointed inspector. This method of procurement does not require qualification of the supplier to quality assurance standards but does require a documented configuration review by procurement engineering where critical characteristics are evaluated.

Level IV, "Catalog Method" procurement is used for items simple enough in design to support an abbreviated method of supplier qualification such as quality history or CASE evaluations. This method requires no separate procurement specification as items are usually ordered by part or catalog number. Items procured via Level IV are accepted based upon a receipt inspection or a supplier certificate of conformance.

The Level V, "Commercial Method", classification of procurement is reserved for those items that can be classified as commercial grade. Procurement under this level requires no procurement specification or qualification of the supplier. Procurement under Level V does however require a critical characteristic evaluation and a determination that the manufacturer's commercial grade program adequately controls critical characteristics. Receipt inspection or post installation test is performed to ensure component critical characteristics continue to be adequately controlled.

Procurement Level	Procurement Specification Required	Method of Acceptance	Supplier Qualification
I	Yes	Source inspection, receipt inspection or C of C	Yes

Procurement Level	Procurement Specification Required	Method of Acceptance	Supplier Qualification
II	References previous specification	Source inspection, or C of C	Yes
III	No	Source or receipt inspection	No
IV	Ordered by catalog number	Receipt inspection inspection or C of C	Partial
V	No	Critical characteristics ensured by receipt inspection or test	No

(2) Material Control Procedure S0123-X1-2.6, "Critical Characteristics Evaluation", provides a method of identifying and verifying the critical characteristics of items designated as procurement Level III or Level V. The procedure requires that an item's safety-related function(s) be determined and that the properties the item must have to perform those functions and the defects that would prevent the functions from being performed be identified. Critical characteristics could include dimensions, cleanliness, corrosion resistance, chemical properties, physical properties or electrical properties.

During the inspection it was noted that the majority of SCE's safety-related procurements were Level IIs, "Replacement-In-Kind," purchased from the original manufacturer/supplier.

B. Maintenance and Purchase Order Review

A computer printout generated from Maintenance Orders issued from January 1984 to December 1986 for work performed on the Auxiliary Feedwater, Chemical and Volume Control, Low Pressure Safety Injection, High Pressure Safety Injection, and Shutdown Cooling Systems was reviewed by the inspectors. For each maintenance order, the printout included a general work description, quality class, seismic category, environmental qualification requirements, and replacement part data. From review of this information, purchasing and maintenance packages involving replacement of parts with safety-related functions were requested so that implementation of procurement practices could be reviewed.

The inspectors reviewed a total of 62 maintenance orders. From this the inspectors selected 42 maintenance order packages for detailed review. Each package consisted of the maintenance order, purchase order, receipt inspection report, certificates of compliance/ conformance, and in some cases original equipment specifications and seismic test reports. Of the 42 maintenance orders reviewed, a problem was noted on only one order.

On Maintenance Order 8504117800, SCE purchased a commercial grade breaker, Procurement Level III, from San Diego Wholesale Electric as a replacement for feeder breaker 2MS4705 which feeds auxiliary feedwater isolation valve 2HV4730. The breaker fulfills a safety-related function which is to control activation of one train of main steam isolation and one train of auxiliary feedwater. The breaker ordered was a two pole Brown Boveri breaker, part number EF2-A030. SCE received a three pole Brown Boveri breaker, part number EF3-A030. SCE wrote a Nonconformance Report (NCR 2-1482) against the three pole breaker.

NCR 2-1482 listed an interim disposition of "accept as is" based on removing the mounting screws from the center pole and functionally testing the breaker after installation. Final resolution was listed as, "Rework, obtain and install a qualified circuit breaker." Under the "Technical Consideration" section of the "Conditional Release of Nonconforming Material," which was attached to NCR 2-1482, it states that the NCR must be closed prior to exceeding the 72 hour action statement which the defective breaker had caused valve 2HV4730 to enter. In addition, it states that the conditional release does not constitute an unreviewed safety question because the replacement breaker will perform the same function, with the same degree of quality and reliability as the replaced breaker. It goes on to say that the attached 50.59 evaluation supports this contention.

The safety evaluation (50.59 review) is page 3 of 5 of NCR 2-1482. It states that the replacement breaker has the same functional specifications, ratings, and physical characteristics as the breaker it is replacing. It also states that the critical characteristics have been verified by inspection and testing and that the valve's safety function will not be impacted by the use of this commercial grade breaker.

A "Critical Characteristics Evaluation" is attached as page 5 of 5 of NCR 2-1482. The critical characteristics are listed as "30 amp full load without a trip" and "Instantaneous trip at overload." The "National Codes and Standards" block is marked "N/A" although IEEE-344 is applicable since the breaker is classified as 1E.

At no point in the documented evaluation is it apparent that seismic qualification of the replacement breaker was considered. The testing which was performed established that the breaker would function properly in its normal operating environment but provides no indication that the breaker would function properly during a seismic event. The inspections consisted of looking for external damage and assuring that the breaker had the same external dimensions as the replaced breaker. Since the breaker is sealed, SCE did not examine the internals of the breaker. Therefore, the inspection did not assure that the breaker's internal operating mechanism was of the same configuration as the breaker which was originally qualified by testing.

SONGS Unit 2 operated with this breaker in place from April 25, 1985 through May 14, 1985, at which time a qualified breaker received from Brown Boveri, with a Certificate of Conformance stating that the breaker had been seismically qualified in accordance with IEEE-344, was installed.

SCE's procurement procedure SO123-XI-2.4, Revision 1, TCN 1-4, dated March 22, 1985, paragraph 6.4, "Level III-Verification Method" states that: "Level III is applied to items whose critical characteristics are capable of being verified after receipt by inspection and or test."

Contrary to the above, SCE's documented evaluation does not indicate that characteristics which would affect the operability of the breaker during a seismic event (e.g., configuration of the internal operating mechanism) were addressed in upgrading the breaker from commercial grade to safety-related.

The failure to verify that the breaker would operate during a seismic event is a Potential Enforcement Finding 50-361/87-03-01.

C. Substitution Part Equivalency Evaluation Reports (SPEERS)

San Onofre material control procedure SO 123-XI-2.5, "Substitution Part Equivalency Evaluation Report," describes the methods to be used when a like-for-like procurement cannot be made and a part substitution is required. The procedure covers two basic types of substitutions: those where only the part nomenclature has changed and those where item configuration changes have occurred. For cases where "nomenclature" such as part number changes have occurred, the procurement engineer determines the part's acceptability. Where item configuration changes have occurred, a separate form is filled out and sent to station technical with the procurement engineer's recommendation on part acceptability. The cognizant technical engineer and his supervisor are then responsible for determining and approving use of the part. All parts that are environmentally qualified are also reviewed by an Engineering and Construction Project Engineer for the necessary EQ evaluation.

The following SPEER's were selected for review from a SPEER printout list. Part substitutions documented in these SPEER's were found to have been done in accordance with the appropriate procedure and to have had the appropriate review by the cognizant engineer where required.

85-0205 - Involved a change of bar graph displays. The new displays had a somewhat lower range of operating temperature which was deemed acceptable by station technical.

85-0376 - Involved an operational amplifier part number change. The op amp was part of an incore flux detector linear amplifier card which had been sent to Sorrento Electronics for repair.

85-0569 - Involved a change out of a thermal heat detector. The detectors had different contact ratings, rate of change, and temperature actuation points. The detectors were deemed acceptable by station technical and required drawing changes due to different wiring configurations.

87-0024 - Involved a changed part number for five Exide batteries. This change was classified as "nomenclature only" even though physical changes had been made to the batteries. These batteries were later determined to be non-safety-related, however, this example does suggest possible misuse of the "nomenclature only" method.

85-0379 - Involved a nomenclature only part number change for a Cutler Hammer rotary switch.

86-0384 - Involved a nomenclature only part number change for a transistor procurement.

86-0167 - Involved a change in thermometer manufacturers.

85-0468 - Was written due to the fact that no part number was known for a slack cable limit switch ordered from Sheppard Niles. The switch was therefore ordered to a drawing and was deemed acceptable for use.

D. Vendor Audits and Source Inspections

As part of the procurement review, audits of four vendors were reviewed; AMP Special Industries, Byron Jackson Division/Borg Warner, Limitorque Corporation, and Target Rock. In all four audit reports reviewed, the content of the reports indicated that SCE appropriately evaluated each vendor's quality assurance program and its implementation. However, as shown by the following examples, the audits and source inspections were not always an accurate assessment of whether the vendor's quality assurance program effectively controlled product quality.

Limitorque Corporation was audited five times between 1978 and 1986; January 1978, September 1981, August 1984, August 1985, and October 1986. The increasing frequency of the audits shows that SCE's audit program responded to known problems by increasing the number of audits. However, the audits failed to note that Limitorque was not requiring Peerless-Winsmith, a subtier supplier of DC motors, to implement a configuration control program and that Limitorque was not performing a configuration review as part of dedicating the motors as safety-related. As a result, motors which were manufactured by Peerless and shipped by Limitorque contained motor leads which were different from those originally environmentally qualified and subsequently several motors failed as a result of the insulation cracking and the motor leads shorting out.

SCE also performed source inspection on two of these motors (serial numbers UN-82222 and UN-82223) prior to shipping. Based on the source inspection report, it appears that the inspection concentrated on a review of the QA documentation, general condition of the items, and compliance with shipping instructions, rather than a technical inspection for compliance to design requirements. Again, although SCE complied with the regulatory and internal procedural requirements, the source inspection was not particularly effective with respect to detecting nonconforming hardware.

One suggestion was made to SCE concerning inclusion of a check to ensure vendors are reviewing design changes for their effect on a components' environmental qualification status. This issue has been identified in a number of recent Vendor Program Branch inspections.

3. Licensee/Vendor Interface

A. Vendor Technical Information

The inspectors conducted a review of the SCE/SONGS vendor information evaluation and tracking system with respect to the receipt and processing of technical information provided by Combustion Engineering (CE), the Institute of Nuclear Power Operations (INPO), the NRC, and other vendors of safety-related equipment and components.

Although SONGS' procedures do not require a list of key components nor do they explicitly require SONGS to contact vendors of key components at any particular interval, SONGS' maintenance personnel were in regular contact with the vendors of key components and were aware and up-to-date concerning problems with vendor equipment.

The lack of a systematic way to assure periodic contact with key vendors is considered a weakness in the written program. However, the actual program implementation has, in fact, resulted in periodic and effective contact with key vendors.

Configuration Control Procedure SO123-XIV-4.1, Revision 1, TCN 1-5, dated September 29, 1986, "Configuration Document Change Control for Supplier Data," is the procedure which provides the direction and methods for reviewing supplier data from vendors to determine changes which must be made to configuration documents, and for recording and monitoring the completion of the required changes. Supplier data is defined as "Documentation including drawings, manuals, bulletins, revisions, updates, or other correspondence, supplied by a distributor or manufacturer who provides equipment to the station or the project, either under contract with SCE or other parties."

This procedure sets the guidelines for controlling the receipt, processing, and evaluations of incoming supplier data. All incoming supplier data is received directly by the Configuration Control Section or is forwarded to Configuration Control by Configuration Document Maintenance (CDM) for coordination of the station review after their receipt and assignment of a CDM Drawing Control Number. Configuration Control reviews the supplier data and associated materials to determine the correct processing of this technical information.

Supplier data such as vendor manual information are entered onto the San Onofre Committee Register (SOCR) for tracking purposes and forwarded to the applicable station technical discipline group. Any review and/or evaluation is then performed by the designated discipline. The tracking and close out of this information on SOCR is monitored and accomplished by Configuration Control upon completion of any procedural changes or component modifications made as a result of this supplier data.

Nuclear Steam System Supplier (NSSS) Technical Bulletins received from Westinghouse (W) and Combustion Engineering (CE) are forwarded to the Independent Safety Engineering Group (ISEG) by Configuration Control for their evaluation.

The inspector also reviewed Engineering and Construction Department (E&C) QA Procedure 40-9-19, Revision 10, "Industry Operating Experience Evaluation Program (IOEE) for SONGS, 1, 2, 3, which describes the program ISEG uses to verify that information pertinent to plant safety originating outside the SCE organization is evaluated and provided to the responsible organizations. The IOEE receives information from various sources to evaluate and distribute. These sources include the NRC (IE information notices and bulletins), INPO (SER's and SOER's), Vendor 10 CFR 21 Reports, and NSSS sources (Westinghouse and CE Technical Bulletins).

ISEG Procedure -001, Revision 0, "Industry Operating Experience Evaluation Program" is the ISEG desk procedure which describes ISEG operating experience evaluation process used for the information for which they have responsibility. E&C 40-9-19 and ISEG -001 state that the ISEG Screening Committee, consisting of members of the ISEG engineering staff, meets when the number of operating experience items received is approximately ten (10). The meetings are held to evaluate operating experience items received, to determine the scope and need for further evaluation, establish evaluation priorities, (normal, prompt and immediate attention) and assign a responsible ISEG engineer for all items requiring further evaluation. These evaluations are documented on an ISEG Operating Experience Evaluation Form and forwarded to the ISEG Supervisor for his review and subsequent action. ISEG evaluations are tracked on the ISEG computerized data base system. Evaluations that request action from other groups within SCE or SONGS are additionally entered and tracked on SOCR.

B. NSSS Interface

The NRC inspector reviewed SONGS' receipt, processing, and evaluations of CE Technical Bulletins since the station began documenting this process in early 1983, when ISEG was assigned this responsibility.

The CE Technical Bulletins or ADP Information Bulletins as they are called by CE, are advisory in nature and concern technical developments related to the application or operation of nuclear plant equipment supplied by Combustion Engineering.

The inspector reviewed the computerized ISEG Data Base for both the Archieved Feedback Log and the Active Feedback Log to determine the current status of all ISEG evaluations of CE Technical Bulletins (CETB) to date.

The inspector reviewed a total of 12 CETB evaluation files from 1983 to present to confirm that ISEG evaluations had been performed and documented by ISEG or another station group assigned the responsibility. After this initial review of the ISEG files, the inspector reviewed the documented evaluations of certain CE Technical Bulletins.

The CE Technical Bulletin and the SONGS action taken are described below:

(1) CETB-85 - Incorrect Wired CPC Circuit Boards

A utility with a CE NSSS found two spare core protecting calculator (CPC) circuit cards had jumpers installed in the wrong locations. The problem was found on the spare data bus terminator No. 2 cards while checking out the circuit cards using the CPC single channel test system.

SONGS Action: SONGS initially screened the CETB for priority status when it was received but did not perform the formal evaluation until January 20, 1987, about one year after receipt.

SONGS ISEG personnel stated this was due to an excessive operating experience backlog of open items (about 100) that had accumulated for evaluation in early 1986. It was also stated that the backlog presently is around 40 open items, which is a more realistic and manageable number to evaluate in a timely manner with the present ISEG staff.

The ISEG evaluation stated that should the incorrect circuit boards be installed in SONGS 2/3, the CPC and the single channel test would default and give a reactor trip signal. SONGS currently has procedure S023-V-R.2.31 in place for functional testing of the "off-line single channel core protection calculator and control element assembly calculation."

As recommended by CE, SONGS has written a Maintenance Order (MO) to inspect the Spare Data Bus Terminator No. 2 boards located in the warehouse for wiring errors. MO 87011149000 was initiated January 15, 1987, but had not been performed as of the date of the inspection.

(2) CETB 86-03 - Reactor Coolant System Flowrate, March 17, 1986

While evaluating operating conditions for various plants, CE recognized that the Technical Specification (TS) on minimum RCS flowrate may not be properly interpreted. Measurement uncertainties may cause the actual RCS flowrate to be less than the flowrate assumed in the safety analysis while the indicated RCS flowrate is within TS Limiting Conditions for Operation (LCO).

SONGS Action: The inspector identified that the formal ISEG evaluation had not been performed and documented to date. The CETB had been identified during the screening committee meeting on June 20, 1986, as requiring further evaluation under normal priority. Status is still listed as open on the ISEG active data base as of February 2, 1987.

A formal technical evaluation of this CETB had been performed and documented by another SONGS engineering group which had requested that station surveillance procedure S023-3-3.25 be revised to ensure that the minimum RCS flowrate is calculated by adding a 4 percent margin to the LCO minimum as recommended by option 2 in the CETB.

The ISEG supervisors stated that this lack of documented evaluation was also due to the excessive backlog problems in operating experience in early 1986.

(3) CETB - 84-13 - Steam Generator Deflector Plate, September 21, 1984

While performing steam generator inspections during refueling outages, two utilities identified displaced steam deflector plates. CE recommended that utilities with applicable NSSS systems should include an inspection of the steam generator deflector plate during their next scheduled refueling outage.

SONGS Action: An ISEG evaluation dated February 28, 1985 stated that an inspection of the Unit 2 steam generator deflection plates was conducted during this refueling cycle and found satisfactory while the Unit 3 inspection will be conducted in the secondary side inspection program scheduled for the first refueling outage.

The inspector interviewed the SONGS engineer who took part in both Unit 2 and 3 steam generator secondary side inspections and reviewed the documented inspection reports, November 1984 from Unit 2 and October/November 1985 for Unit 3, to verify that the steam deflector plate was inspected.

In general, the inspector viewed the evaluations as comprehensive and complete but in some cases the evaluations could have been performed in a more timely manner.

C. Diesel Manufacturer Interface

A review of SCE's diesel maintenance program was conducted by the NRC inspector. This review included SCE's action in response to vendor supplied information and to Part 21 notifications, as well as SCE's procedures for general upkeep of the diesel engines. The inspector noted that SCE's diesel related Part 21's were being logged, tracked, and closed out appropriately. Records reviewed included a Part 21 Log Book, maintenance orders, vendor correspondence, and diesel procedures.

A review of diesel procedures revealed adequate detail. Examples noted were: illustrations to aid in understanding complex tasks (engine disassembly/reassembly); torque values with sign-offs and verifications; difference noted and value assigned to normal running and shutdown sump oil levels.

The inspector noted experienced and knowledgeable engineers were assigned to SONGS diesel generators. The inspector noted that procedures allow engine warm-up in accordance with engine manufacturer's recommendation (reduced RPM) and that all engines and engine rooms were very clean. Every item pursued by the inspector [Deviation Log Item 85-06, cam shaft bearing support bracket; SER 86-22 Governor failures on EDGs; TDI Part 21 items (approximately 20 items since 1983); SPEER 85-0674 on TDI piston Pin Assy Configuration Change] was found to be properly reviewed, logged, controlled and closed.

D. Interface With Other Vendors

(1) BISCO Fire Seals/Stops

As part of the VIB's review of the qualification of Brand Industrial Services Company (BISCO) fire stops, this inspection compared the configuration of installed fire stops at SONGS with the qualification test reports supplied by BISCO.

Fire stop SE-30-5-103-1006 was chosen for inspection because it was an accessible three-hour rated BISCO stop. Fire stop SE-30-5-103-1006 '3' is a three hour rated, 42" x 178", wall block out. The block out is divided into compartments that measure 10 square feet. The blockout was further compartmentized by placing a marinite board over the top of each cable tray. This allowed the foam to be placed around the cable trays and cables to still be pulled. At a later date, after all cables were pulled, foam was placed around the cables, between the cable tray and the marinite board. Additionally, several conduits were run through the blockout at the top and bottom of the blockout and beside cable tray 1006F.

Sheet 16 of BISCO's drawing S023-411-22-94-3 indicates that the applicable BISCO seal detail and test report numbers are 3001-D and 1064-10 respectively. Seal detail 3001-D shows a typical compartmentized vertical blockout greater than 10.27 square feet. Test report 1064-10 provides the results of a fire test on a 37.5" x 40" blockout containing two cable trays sealed with 9.75" of SF-20 silicone foam. For the compartments which contain both cable trays and conduits, test report 748-134, providing the results of a fire test performed on one cable tray and one 5" conduit contained in a 15" x 30" (5.2 square feet) compartment with 9" of SF-20 foam was the basis for qualifying the blockout for a three-hour rating.

Fire stops having an installed configuration which is different from and possibly less conservative than the configuration qualified is considered an open item. The differences are:

(1) The installed configuration involves two cable trays and two 1" conduits within one 10 square foot compartment versus a qualified configuration of one cable tray and one 5" conduit within a 5.2 square foot compartment (Test Report .748-134).

(2) Subcompartmentizing the cable trays by placing a marinite board over the trays and foaming the trays separately from the rest of the blockout.

This open item will be referred to the Plant Systems Branch for followup.

(2) Foxboro Controllers

On June 26, 1986, the NRC issued IE Information Notice 86-52, "Conductor Insulation Degradation On Foxboro Model E Controllers." San Onofre Unit One was one of the plant sites that had been identified as having the affected controllers. The problem with the controllers was identified as potentially defective insulation on the interconnecting coil-cord cable sets. In response to the notice, San Onofre inspected 6 of the 40 controllers installed in Unit One and found one with degraded insulation. This cable set was then sent to Wyle Labs where it underwent further aging. Two-off-the-shelf samples in addition to the sample aged at Wyle were then sent to ECAD services where they were tested for continuity and insulation resistance using fine domain reflectometry instruments. All samples exhibited good insulation resistance and continuity after performing numerous coil extensions. The testing indicated that the coil cords installed at San Onofre would continue to provide an acceptable level of insulation resistance until replacement coil cords could be installed.

San Onofre has written a JCO to allow continued use of these coil-cords until they can be replaced during the next outage. Maintenance orders to replace the coil-cords have been written and were reviewed by the inspector.

(3) Limitorque Motor Operators

During the inspection, San Onofre's response to IE Information Notice 87-08, "Degraded Motor Leads In Limitorque DC Motor Operators" dated Feburary 4, 1987 was reviewed. Southern California Edison had been identified in the notice as receiving potentially defective DC motors from Limitorque. The motors in question were known to likely contain unqualified Nomex-Kapton type lead wires which had recently failed at two nuclear sites. These motors were found to have been purchased as spares and were located in the supply warehouse. The motors had been

tagged as nonconforming material. The inspector examined the two motors (SIN UN82223 and UN 82222) and observed slight insulation damage on one lead of one motor. The motor leads were of the unqualified Nomex-Kapton type wire.

The inspector also examined a shipment of Reliance AC motors that SCE had received from Limitorque. A number of these motors were found by SCE to have had crooked or cracked grease seals installed during manufacture. These motors had been tagged as nonconforming material and were being prepared to be shipped back to Limitorque for analysis.

An inspection of a non-EQ safety-related Limitorque operator installed in Unit Two was conducted. The operator was for the auxiliary feedwater control valve. When the cover for the limit switch compartment was removed, the inspector observed insulation damage on one of the internal motor leads. The damage appeared to have been caused by chafing against the terminal box cover and had penetrated through the outer protective layer of fiberglass sleeving on the lead. The inspector was told that damage of this type was not uncommon in SMB-000 type operators due to their small size and the large amount of wire installed into the limit switch compartment. A recent inspection conducted by SCE on 73 Limitorque operators revealed six with nicked wires and three with wires slightly damaged. Because of these problems, any time a cover is removed from a SMB-000 operator, SCE inspects the wiring for damage.

(4) TECH 914-1 Valve Flow Monitor Modules

The NRC inspector reviewed Southern California Edison's (SCE) reportability evaluation and corrective action relative to Technology for Energy Corporation's (TEC) quality deviation notice which identified a potential deviation in TEC's model 914-1 Valve Flow Monitor Modules. The valve flow monitors are used for distinguishing between leakage by a safety relief valve and a valve which is stuck open. The monitors supplement temperature detectors because a temperature detector cannot distinguish between leakage and larger flows once the pipe heats up. The deviation results in a failure of the module to reset after indicating full flow through the valve (bar graph "latch up") which is caused by a defective U5 (a Texas Instrument TL490CN analog level detector). The symptom of bar graph latch up is failure of the indication to reset upon removal of input signal. After a valve has opened and the input to the TEC 914-1 is at a high level, all LEDs on the front panel bar graph will be lit. After the valve has closed and the input to the TEC 914-1 is at about 0 volts (background), all LEDs on the bar graph should extinguish. In TEC model 914-1 modules containing a defective U5, the LEDs on the bar graph will remain lit even though the signal output and RMS output have both decreased to about 0 volts (background). In a TEC deviation notice dated July 19, 1985, it was recommended to SEC that all TEC 914-1 modules be tested according to TEC procedure No. 914-1-TP-01. This procedure can be performed as a bench test, with the TEC 914-1 removed from

the rack. TEC recommended that modules with a defective U5 should be replaced with the 914-2, which is a direct replacement for the 914-1, identical in form, fit, and function and is equally qualified. It was designed to replace the 914-1 after Texas Instruments discontinued production of the TL490CN.

In September 1985 SEC performed an engineering evaluation for the potential 10 CFR 21 reportable condition to determine the described deficiency's effect on the system(s). Based upon the engineering evaluation the initial assessment was that the issue deserves attention although the subject deficiency does not appear to render the system(s) inoperable or prevent the fulfillment of the system(s) safety function. As a long term corrective action, it was recommended that SCE's maintenance department perform a simulation test on the monitors to identify if the described deviation existed at San Onofre Units 2 and 3. If the deviation is identified to exist, the analog detector will be replaced with the vendor recommended replacements. Unit 1 was exempt from the evaluation, as the safety valves for this unit utilize stem mounted limit switches with a Conax conductor seal module assembly for direct valve indication. Each limit switch has a position indicator in the control room and alarms are provided in the control room to indicate if either of the PORVs or safety valves are open. The stem mounted limit switches are powered from vital buses and in addition to the valve position indicator, other methods of determining valve positions are discussed in emergency procedures as an aid to operator diagnosis and action.

The NRC inspector reviewed SEC maintenance order (MO) No. 86091367999 (Unit 2) dated April 23, 1986 and maintenance order No. 85091375000 (Unit 3) dated October 7, 1985. Both MOs specified the necessary requirements which SCE committed to in their engineering evaluation and the work was performed per the required technical procedures and vendor recommendations.

(5) Amp Splices

The Amp Products Corporation has marketed two types of butt splice connectors for nuclear applications. One type is a kynar splice containing shrink end seal and has been environmentally qualified for specific installed configurations. The other type is a kynar splice without a shrink type end seal and has not been environmentally tested for use in this in-line configuration. SCE had found this untested type of splice to be acceptable for use in unrestricted configurations at San Onofre.

Qualification package M38777 for Unit 1 and M37601 for Units 2 and 3 both allow the use of Amp butt splices without shrink type end seals (P/N 53549-1) in any area inside or outside of containment. It has been demonstrated that these splices have not been installed in Units 2 and 3, however, they may have been used in Unit 1. During the course of the inspection, SCE provided installation procedures which reasonably assured that the Amp

splices were not used in any EQ area in Units 2 or 3 unless they were covered with another type of qualified splice insulation. No definitive conclusion could be reached concerning the use of these splices in Unit 1 due to a lack of available documentation pertaining to what types of splices or additional insulation may have been used during plant construction and subsequent cable repairs made during the early stages of Unit 1 operation.

The listing of the Amp butt splices in the qualification packages for use in any application without adequate justification is considered a Potential Enforcement Finding 50-206/87-02-01.

Further, whether these Amp butt splices were actually used in applications requiring qualification in Unit 1 is considered an unresolved item. (50-206/87-02-02)

E. Evaluation of Reports of Defects Submitted by Vendors Pursuant to 10 CFR Part 21

The program for processing 10 CFR 21 correspondence was reviewed by the inspector to verify that information pertinent to plant safety originating from within or outside SCE is being considered.

Quality Assurance maintains overall responsibility for the receipt and tracking of potential conditions which require evaluation. The Operations and Maintenance Support (O&MS) group has assumed the responsibility for coordinating the SONGS review of 10 CFR 21 correspondence and the implementation of corrective actions if required.

QA procedure N2.08, Revision 10, dated January 2, 1987, "Review of Potential Deviations and Reporting to the NRC in Accordance with 10 CFR 21," was reviewed. This procedure defines the SCE program for compliance to all provisions of 10 CFR 21. This procedure also stipulates that QA must maintain a log of all reports of potential defects received from vendors. The inspector reviewed the log which was updated as of January 22, 1987.

The O&MS procedure which implements this program at SONGS was still in the draft phase during the inspection and was reviewed by the inspector. The O&MS group maintains their own 10 CFR 21 tracking system of correspondence which includes input into SOCR when information or further evaluations are required from other station groups such as Station Technical, SEC, or COPE. The inspector reviewed the O&MS Part 21 Tracking System Log.

There is a nuclear generation site General Procedure SO123-XV-2.0, "Reporting of Substantial Safety Hazards Pursuant to 10 CFR 21," as well as specific procedures for other working groups at SONGS.

It appears that the program in place at SONGS for the receipt, processing, and evaluation of 10 CFR 21 notifications from vendors, if continued to be implemented in its present form, is adequate.

5. Exit Meeting

On March 6, 1987, an exit meeting was conducted with the licensee representatives identified in Paragraph 1. The inspectors summarized the inspection scope and findings as described in this report.

In summary, while SONGS does not have a list of vendors of key components, nor do they have a program for contacting vendors of key components on an established frequency, SONGS has a very active interface with many of their vendors and Westinghouse, CE, Transamerica Delaval, Stewart Stevenson and Limitorque in particular. With the exception of the issues involving AMP Industries and Peerless-Winsmith, which had developed in the two weeks immediately preceeding the inspection, SONGS was well aware of any problems reviewed by the inspectors.