APPENDIX A

NOTICE OF VIOLATION

During an NRC inspection conducted during the period of May 21 through June 15, 1990, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions", 10 CFR Part 2, Appendix C (1990), the violations are listed below:

Criterion III of 10 CFR Part 50, Appendix B, Design Control, requires that "...Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design...."

The design control measures for the original design of the Units 2 and 3 safety related Main Steam Isolation Valves (MSIV's) and Main Feedwater Isolation Valves (MFWIV's) included calculations to demonstrate valve operability during and subsequent to the design basis seismic event. These calculations established that valve yoke deflections for the MSIV's and MFWIV's were respectively 5 and 8 mils below the manufacturer's acceptance criteria of 17 mils and 20 mils, respectively, for the MSIV's and MFWIV's.

Contrary to the above, between October of 1984 and April of 1990, design changes were made to attach the hydraulic dump valves to the outside of the MSIV's and MFWIV's and to replace the Marotta hydraulic dump valves with heavier Paul Munroe Enertech hydraulic dump valves without performing calculations to evaluate whether the valve would be operable during and subsequent to the design basis seismic event.

Preliminary calculations for the modified systems performed in May 1990 showed maximum valve yoke deflections for the design basis seismic event for the MSIV's and for the MFWIV's to be 16 mils and 19 mils, respectively.

This is a level IV violation applicable to Units 2 and 3, Supplement I.

Pursuant to the provisions of 10 CFR 2.201, Southern California Edison Corporation is hereby required to submit a written statement of explanation to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to the Regional Administrator, Region V, and a copy to the NRC Senior Resident Inspector at San Onofre Units 1, 2 and 3, within 30 days of the date of the letter transmitting this Notice. This reply should be clearly marked as a "Reply to a Notice of Violation", and should include (1) the reason for the violation if admitted, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. If an adequate reply is not received within the time specified in this Notice, an order may be issued to show cause why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Consideration may be given to extending the response time for good cause shown.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Dennis F. Kirsch, Chief
Reactor Safety Branch

Dated at Walnut Creek, California
this 3 day of August, 1990

APPENDIX B

Reply to SCE Letter Dated July 16, 1990

Your letter, dated July 16, 1990, addresses several concerns with the conclusions reached by NRC inspectors during recent inspections of SCE engineering work. These NRC conclusions were documented in inspection reports 90-14 and 90-15 and discussed during the exit meeting for inspection report 90-16. In this regard, your letter states that "in a number of instances problems have been attributed to engineering program weaknesses which we conclude primarily result from other causes". The following discussions are provided to respond to your observations and are presented in the interest of maintaining clear and open communication.

1. Installation of Incorrect Model of Pressure Transmitter

a. SCE observation:

Your letter states that during the June 15 exit meeting, NRC inspectors characterized error "as related to interface problems in the engineering and equipment quality program." In particular, you noted that the mistake occurred outside the engineering program, sometime after the maintenance order correctly specified the transmitter.

NRC response:

During the exit meeting, NRC inspectors characterized this transmitter deficiency (along with several errors in EQ documentation, equipment control, and installation configuration) as being indicative of apparent interface problems within the Equipment Qualification (EQ) program. This characterization is still considered to be correct. The inspectors also summarized several findings of independent self-audits of engineering and EQ programs as involving problems at the interfaces between functional groups. There was no intent to characterize this particular transmitter problem as an engineering error, although review of the maintenance order (MO) by EQ or design engineering could have identified the problem, since the incorrect model transmitter was clearly documented on the completed MO.

b. SCE observation:

"At the June 15 exit interview, the fact that an NCR was not written to document the identified error until May 20 was characterized as untimely. (Unit 3 was in a refueling outage at the time.) Our review of the sequence of events, in which it was first verified that a mistake in data recording had not occurred during the walk-down, indicates that the discrepancy was controlled and tracked appropriately under the circumstances and that the initiation of the NCR was not untimely."

NRC response:

The nonconforming condition was discovered during a walkdown on May 3, 1990. Nonconformance report NCR-90050164 was not written until

May 22, (nineteen days later). Your July 16 letter states that after the initial identification of the discrepancy, an additional walkdown was performed to verify that the discrepancy was the result of an incorrect model transmitter rather than inaccurate data recorded during the original walkdown. You indicated that since Unit 3 was shut down, an incorrect model transmitter did not pose a safety concern for Unit 3. However, since Unit 2 was operating, a safety concern may have existed if the root cause of the Unit 3 installation error was also applicable to Unit 2. Many programs supporting all three units are common, and lack of prompt NCR issuance because the affected unit is shut down may not be a valid justification.

Your walkdowns found that, for Unit 2, 35 of 35 Rosemount transmitters inspected were the correct model, and for Unit 3, 34 of 35 Rosemounts inspected were the correct model. The installation of an incorrect transmitter model appeared to be isolated. However, this justification for the delay did not appear to have been documented during the time between identification of this nonconformance and the issuance of an NCR.

2. Atmospheric Dump Valve (ADV) Positioner Seismic Certification

SCE observation:

"As a result of an audit, SCE identified that Units 2 and 3 ADV positioner/transmitters had not been seismically qualified. (The devices were subsequently qualified by test.) At the June 15 exit interview, the initial lack of seismic qualification was identified as resulting from a problem involving the engineering interface."

NRC response:

The NRC inspector's understanding of the ADV issue, from interviews with QE personnel, was that a QE audit identified that, although the engineering organization required seismic qualification of the ADV positioner, the procurement organization had obtained equipment with questionable seismic qualification. During subsequent discussion, the inspector concluded that the error had occurred as a result of an interface problem between engineering and procurement. The fact that this may have been an incorrect conclusion is acknowledged, and is reflected in the attached inspection report.

3. Your letter also discusses engineering program weaknesses. You state:

"Also, as was acknowledged in the exit interview on June 15, a number of the problems result from prior, recognized engineering program weaknesses which have now been corrected."

a. Modifications to Hydraulic Valve Actuators

SCE observation:

"With respect to our current engineering program, the omission of a documented operability determination resulted from inappropriate reliance by SCE on the prior modification work. That is, we did not apply our in-house design procedures and review process to the modifications in 1989 and 1990 because they were based on apparently successful modifications performed earlier. Corrective action to prevent recurrence of this error has been taken, and a seismic/structural analysis standard will be implemented by January 1991 to define requirements for future work. A review is being conducted to identify and correct any similar omissions of documented determinations of operability during a seismic event elsewhere in the design.

With respect to the initial omission of documented consideration of operability, this omission was contrary to the contractor's procedural requirements. The contractor has also been requested to take corrective action to prevent recurrence."

"Based on the existing low seismic stresses for the Marotta valve installation, piping and support stresses were not revised when the heavier Paul Munroe valves were installed on the MSIVs."

NRC response:

(1) We agree that this engineering error appears to be due partly to earlier engineering program weaknesses, however, as you also indicate, the error also involves a present weakness of assuming prior modifications were appropriately designed and analyzed.

(2) Your corrective action is acknowledged.

(3) Concerning the reason for not revising seismic stress calculations; it is important to note that "...low seismic stresses for the Marotta valve installation..." were not alone sufficient to justify not revising the piping and support stresses when the heavier Paul-Munroe valves were installed. Particular concerns included:

(a) The Paul Munroe valves were approximately 2.4 times heavier than the Marotta valves.

(b) Seismic response (i.e. acceleration amplitude) could increase significantly as a result of the added mass. This could be difficult to predict without an evaluation including review of seismic response spectra and piping fundamental frequencies.

(c) Some of the affected supports (e.g., supports S2-ST-972-H001 and S2-ST-523-H001) had relatively small margins between actual loads and design load limits.

b. Unit 3 Fault Current Calculation

SCE observation:

"Our review has concluded that the correct, higher fault current for Unit 3 was used in the analysis and properly reflected in the documentation. The documentation does include an editorial error on pg. 1,651 in which the lower fault current value for Unit 2 exists at one place in the explanatory text. This appears to have been an isolated oversight, and it did not contribute to any error in the result."

NRC response:

(1) We agree that this error is editorial, however, the error provides inaccurate technical information which could have resulted in additional, future, technical errors.

(2) A more thorough engineering review (especially of previous design packages that are being updated for use on a different unit) will prevent these types of errors, others of which are documented in the 90-15 report.

c. Engineering Review of Loop Accuracy Calculations

SCE observation:

"In September 1989, SCE performed a loop accuracy calculation for the ATWS/DSS design change which had been engineered by a contractor. This was a new practice for SCE at the time, and the ATWS/DSS loop accuracy calculation was the basis for our subsequent development of an internal standard for such calculations. Accordingly, the standard would now call for consideration of fluctuation of containment pressure, as permitted by the Technical Specifications. However, it was not a significant variable in this instance."

NRC response:

Our primary concern on this item involved vigor and thoroughness exercised in engineering reviews. This calculation had been reviewed by 4 different engineers (the calculation was performed by an SCE engineer, reviewed by an independent SCE engineering reviewer, and approved by two levels of SCE supervising engineers). None of these reviewers considered the containment pressure variation allowed by the plant technical specifications.

d. ATWS/DSS Design Implementation

Inspection report 90-15 states:

"(S)ignal compatibility of the ATWS modification with the existing Critical Function Monitoring System (CFMS) was not well thought through by design engineering. The ATWS system included a 14-bit analog-to-digital conversion card while the CFMS utilized a 12-bit conversion. Also, the ATWS modification used a voltage signal of 15 volts while the CFMS used a 8.3 volts signal.

SCE observation:

"This design was performed in 1987 by a contractor to SCE. The design correctly specified the requirement for interface compatibility, however the manufacturer did not meet the requirement in the delivered equipment. Field testing accurately identified the incompatibility and our engineering program provided appropriate corrective action...while we recognize that additional engineering review of manufacturer designs can reduce the incidence of incompatible conditions, interferences, etc. developing in the field,...additional review is often inconsistent with the expedited schedules imposed on modification designs."

You also noted that it might not be cost effective.

NRC response:

We acknowledge your comments. However, we note that, in this instance, the discovery of incompatibility during field construction resulted in additional schedule impacts and a great number of FIDCN's. These types of late identified problems can have a negative impact on quality engineering work and would seem to indicate that it is not prudent to substitute field construction and testing for thorough design engineering.

e. Occurrences of Interferences In the Field

SCE observation:

"Inspection Report No. 90-15 identified as examples of 'inadequate engineering design control' two cases of interference identified in the field, rather than during design development...SCE's engineering program does provide for an appropriate level of field walk-down to identify interferences and for maintenance of necessary as-built drawings. However, it does not attempt to preclude any interferences in circumstances when designs are developed and implemented in parallel over an extended period. In our experience, it would be impractical as well as unnecessary to attempt by engineering review to preclude all field interferences."

NRC response:

We agree that minor installation interferences are expected to be encountered during implementation of a design change package. However, based on DCP review and interview with your technical staff, it appeared that you do not maintain design control in the assignment of containment locations and of terminal points. We have the following understandings of your practice.

(1) For equipment to be installed in containment, you apparently do not control assignment of installation locations until a

significant amount of DCP work is completed. Therefore, seismic analysis, cable raceway designation, etc., must be performed a second time if parallel DCP development allows interference by another DCP and results in a different installation location for the first DCP. Delays and rework could also be a radiation exposure concern in containment.

(2) You apparently do not control assignment of termination points and terminal locations, resulting in potential problems with cable runs when a DCP is released to the field.

(3) You also apparently do not perform a design check for containment location and terminal points when releasing a package.

Field walkdowns might reduce the number of interferences, but it would not account for interim change implementation between the walkdown and installation. Although parallel development efforts and design changes occur over extended periods of time, a good design control program coordinated with controlled as-built drawings designating future installations would minimize the problems that we observed in these areas.

In conclusion, we thank you for your letter and your continued involvement in your engineering program. This involvement is encouraging, as are your improvements in engineering, your design basis documentation, and your strong audit program.