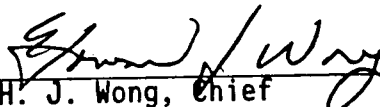


U.S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-206/92-29, 50-361/92-29, 50-362/92-29  
Docket Nos. 50-206, 50-361, 50-362  
License Nos. DPR-13, NPF-10, NPF-15  
Licensee: Southern California Edison Company  
Irvine Operations Center  
23 Parker Street  
Irvine, California 92718  
Facility Name: San Onofre Units 1, 2 and 3  
Inspection at: San Onofre, San Clemente, California  
Inspection conducted: October 22 through November 30, 1992  
Inspectors: C. W. Caldwell, Senior Resident Inspector  
D. L. Solorio, Resident Inspector

Approved By:

  
H. J. Wong, Chief  
Reactor Projects Section II

12/24/92  
Date Signed

Inspection Summary

Inspection on October 22 through November 30, 1992 (Report Nos. 50-206/92-29, 50-361/92-29, 50-362/92-29)

Areas Inspected: Routine resident inspection of Units 1, 2 and 3 Operations Program including the following areas: Operational safety verification, radiological protection, security, monthly surveillance activities, monthly maintenance activities, independent inspection, licensee event report review, and followup of previously identified items. Inspection procedures 40500, 62703, 71707, 92701, were covered.

Safety Issues Management System (SIMS) Items: None

Results:

General Conclusions and Specific Findings:

Strengths

The NRC inspector observed that root cause investigations conducted by the Operations and Maintenance organizations were thorough and self-critical (Paragraph 5.a). One example of a detailed Maintenance division

investigation was identified concerning the licensee's actions to resolve weld filler material discrepancies (Paragraph 6.c).

#### Weaknesses

In a few cases, SCE has not submitted timely update reports to inform the NRC of the status of continuing actions. For example, the licensee submitted an event report concerning weaknesses in the in-service test program in Unit 1 in October 1990, but since that time the licensee has not submitted a supplemental report. There was not enough information in the original report to make an appropriate assessment of the issue. More timely submittal of supplemental reports to keep the NRC informed on the status of the licensee's actions is encouraged (Paragraph 6.c).

A discrepancy between the frequency of Station Technical engineer system walkdowns and management expectations was observed (Paragraph 5.b).

#### Significant Safety Matters:

Summary of Violations: None.

#### Open Items Summary:

During this report period, one new followup item was opened and seven items were closed.

## DETAILS

### 1. Persons Contacted

#### Southern California Edison Company (SCE)

H. Ray, Senior Vice President, Nuclear  
H. Morgan, Vice President and Site Manager  
\*R. Krieger, Station Manager  
J. Reilly, Manager, Nuclear Engineering & Construction  
\*B. Katz, Manager, Nuclear Oversight  
\*R. Rosenblum, Manager, Nuclear Regulatory Affairs  
\*W. Marsh, Assistant Manager, Nuclear Regulatory Affairs  
K. Slagle, Deputy Station Manager  
\*R. Waldo, Operations Manager  
\*L. Cash, Maintenance Manager  
\*D. Breig, Manager, Station Technical  
\*M. Short, Manager, Site Technical Services  
M. Wharton, Manager, Nuclear Design Engineering  
P. Knapp, Manager, Health Physics  
\*W. Zintl, Manager, Emergency Preparedness  
\*D. Herbst, Manager, Quality Assurance  
C. Chiu, Manager, Quality Engineering  
\*J. Schramm, Plant Superintendent, Unit 1  
\*V. Fisher, Plant Superintendent, Units 2/3  
\*G. Hammond, Supervisor, Onsite Nuclear Licensing  
\*J. Jamerson, Lead Engineer, Onsite Nuclear Licensing  
\*M. Farr, Engineering Aide, Onsite Nuclear Licensing  
J. Reeder, Manager, Nuclear Training  
H. Newton, Manager, Site Support Services  
\*J. Hirsch, Supervisor, Power Generation  
\*A. Kaneko, Assistant Manager, Design Engineering  
\*M. Herschthal, Assistant Manager, Nuclear Systems Engineering

#### San Diego Gas and Electric Company

\*R. Erickson, Site Representative

\*Denotes those attending the exit meeting on December 1, 1992.

The inspectors also contacted other licensee employees during the course of the inspection, including operations shift superintendents, control room supervisors, control room operators, QA and QC engineers, compliance engineers, maintenance craftsmen, and health physics engineers and technicians.

### 2. Plant Status

#### Unit 1

The Unit was permanently shut down on November 30, 1992, after 377 continuous days of operation.

Unit 2

The Unit operated at power during this inspection period.

Unit 3

The Unit operated at power during this inspection period.

3. Operational Safety Verification (71707)

The inspectors performed several plant tours and verified the operability of selected emergency systems, reviewed the tag out log and verified proper return to service of affected components. Particular attention was given to housekeeping, examination for potential fire hazards, fluid leaks, excessive vibration, and verification that maintenance requests had been initiated for equipment in need of maintenance. The inspectors also observed selected activities by licensee radiological protection and security personnel to confirm proper implementation of and conformance with facility policies and procedures in these areas. Several minor discrepancies were noted this period and discussed with shift supervisors for resolution.

No violations or deviations were identified.

4. Monthly Maintenance Activities (62703)

During this report period, the inspectors observed or conducted inspection of the following maintenance activities:

Observation of Routine Maintenance Activities (Unit 1)

MO 92091987000	"Hydro Discharge Piping Of The Spent Fuel Cooling Pumps."
MO 92081788000	"Determine Cause Of Leak Through Auxiliary Feedwater Pump Seal Water Supply Check Valve."
CWO 92102165000	"Perform Visual Check Of Auxiliary Feedwater System Supports."

The inspector observed support work for a visual inspection of auxiliary feedwater (AFW) system piping and supports located in a trench between the AFW system tank and pumps. This work was being performed in accordance with construction work order (CWO) 92102165000 as part of a facility modification using the AFW tank as a makeup source of water to the spent fuel pool (SFP). After removal of the deckplates over the pipe trench, the inspector noted that there was a substantial amount of water which had to be drained by the licensee using a submersible pump (since no drainage was provided in the trench).

The modification to the AFW system was to support long-term storage of

fuel in the Unit 1 SFP. As such, the inspector was concerned that the AFW piping and supports would not be inspected on a frequent basis and that additional water buildup could occur, resulting in corrosion to the piping and associated supports. The inspector discussed this concern with the licensee, who committed to perform a monthly observation inside the trench. However, the mechanism for ensuring that those inspections would take place had not been formalized. Resolution of the licensee's method for performing those inspections is identified as Inspector Followup Item (50-206/92-29-01).

After the water was removed from the trench, the licensee performed a visual inspection of the AFW piping supports. The CWO referenced Section XI of the 1977 edition (through the summer 1978 addenda) of American Society of Mechanical Engineers (ASME) Code IWA-2213, 1977. The CWO also referenced Quality Control Instruction (QCI) G-005, "ASME Section XI Inservice Inspections," for conduct of the work. However, the inspector noted that QCI G-005 referred to the 1974 edition (including the summer 1975 addenda) of ASME Section XI requirements for Unit 1. As a result of the different Section XI requirements being listed, the inspector was concerned that this could create confusion for people performing the work. The licensee acknowledged the inspector's concern and indicated that they would fix the discrepancy. However, the licensee's evaluation of the concern indicated that the discrepancy did not affect inspections already conducted.

No violations or deviations were identified.

5. Independent Inspection (40500, 71707)

a. Review Of Division Root Cause Incident Investigations (40500)

The inspector reviewed the Operations and Maintenance Division Experience Reports (ODERs and MDERs) for events that occurred in 1992. The inspector noted that procedures SO123-0-35, "Operations Division Experience Report," and SO123-I-1.42, "Maintenance Division Experience Report (MDER)," were detailed in their descriptions of how to perform root cause assessments. However, the inspector noted a difference between the Operations and Maintenance procedures in establishing the threshold for initiating division investigations. This was discussed with licensee management, who indicated that they were aware of the difference and were pursuing resolution of the discrepancy. During the review, the inspector also observed that ODERs for Units 2 and 3 events were somewhat more detailed than those for Unit 1 events.

The inspector reviewed a number of Operations and Maintenance division investigations and observed that they were detailed and self-critical. Root causes and corrective actions were defined for the reports reviewed. As a result, the inspector considered that the licensee's divisional root cause assessments had improved over those performed in past years.

b. Boric Acid Crystal Buildup in Unit 1 (71707)

In mid-September 1992, the inspector performed a walkdown of the Unit 1 charging pump room (containing the two charging pumps). During the walkdown, the inspector noted a buildup of dry boric acid crystals on the lube oil Dresser coupling of the north charging pump. This concern was brought to the attention of both the Unit 1 shift superintendent and the cognizant engineer. As a result of this concern, Radioactive Material Control (RMC) personnel removed the boric acid. One week later, the inspector verified that the boric acid had been removed.

While performing a walkdown of the charging pump room in the beginning of November 1992, the inspector noted wet and dry boric acid crystals in the same location. (Approximately six weeks had passed since identification of the dry leak in September.) Followup investigation identified that the responsible system engineer had not been in the room since the first occasion to observe the change from a dry to a wet leak. The inspector noted that in cases of wet boric acid leaks, non-conformance reports are sometimes necessary to justify continued operation when leaks will not be repaired. Subsequent to discussions with the inspector, the Engineering organization initiated a non-conformance report for the leak, but documented it as a dry leak.

The inspector reviewed the policy document for the roles and responsibilities of Station Technical personnel. The policy identified that management expectations were that system engineers should perform walkdowns of their systems on a weekly basis. Based on this observation, it appeared that there was a misunderstanding of the expectation. Engineering management indicated that they believed a six week frequency was too long, and would reiterate to Station Technical personnel the importance of walking down systems on a frequent basis. The inspector considered these actions appropriate.

No violations or deviations were identified.

6. Follow-Up of Previously Identified Items (92701)

a. (Closed) Followup Item (50-206/91-36-04). "Are EPRI and Other Tests Factored Into the Fire Hazards Analysis."

This item identified a concern that Factory Mutual Insurance Company and Electric Power Research Institute (EPRI) test results did not appear to be factored into the licensee's fire hazards analysis (FHA). In particular, the February 1984 FHA, and subsequent revisions through February 1991, indicated that cable tray fires would be slow burning. However, EPRI tests conducted in 1983 showed that cable tray fires can be very rapid under certain conditions.

The inspector discussed this issue with responsible licensee personnel, who indicated that they had evaluated the statement in the FHA concerning slow burning cable tray fires and deleted it in certain cases. The licensee indicated that the statement was based on the combustibles and ignition sources in the room. Under normal circumstances, these would be low. However, the EPRI test showed that if a few gallons of heptane were ignited under a cable tray, a rapid fire would ensue. Hence, the confusion by making a blanket statement that cable tray fires are slow burning. In addition, other clarifications to the FHA regarding the design basis fire were made to ensure that too much credit was not taken for cable fire propagation rate when performing evaluations.

With regard to industry testing as applied to the FHA, the licensee indicated that they are not a member of EPRI, but are a member of the Edison Electric Institute (EEI) which has representation with EPRI. Thus, SCE is aware of EPRI information and if necessary can obtain that information from EPRI through separate contractual arrangements. The inspector considered that the licensee's actions were appropriate. This item is closed.

b. (Closed) Followup Item (50-206/92-23-04), "Uncontrolled Weld Filler Material Stop-Work Order."

This issue concerned a "Stop Work" order by the Maintenance Manager on August 25, 1992, for all welding, as a result of a Quality Assurance (QA) surveillance that found uncontrolled weld filler material in various areas of the plant.

To evaluate the issue, the licensee retained tight restrictions on the use of filler material for non-critical plant welding and performed a Maintenance division root cause investigation. The licensee determined that the issue did not affect the integrity of safety-related equipment since the weld rod was used mainly for personal projects. The licensee also determined that poor judgement was exercised by a number of individuals in knowingly allowing uncontrolled rod in the various site areas. For corrective actions the licensee performed a number of actions, including review of program requirements with the appropriate personnel. The inspector considered that the licensee's investigation of the situation was adequate. This item is closed.

c. (Closed) Followup Item (50-206/92-26-04), "Adequacy and Timeliness Of Unit 1 Licensee Event Report 90-18."

This issue concerned Unit 1 licensee event report (LER) 90-18, Revision 0, "Valves Not Inservice Tested In Accordance With Technical Specification 4.7 Inservice Inspection Requirements." In particular, the inspector reviewed the LER abstract which had been issued in October 1990. The LER indicated that a supplemental report was expected to be submitted by April 26, 1991. However, one

had not been issued. The inspector was concerned with the adequacy of providing only an abstract, and not providing any supplemental information for more than two years.

The inspector discussed the issue with responsible personnel in the Office of Nuclear Reactor Regulation (NRR) who indicated that they considered there was not enough information in the original LER to make an appropriate assessment of the issue. In addition, two years was a sufficiently long time that it would have been appropriate to provide supplementary information to the NRC. This was discussed with licensee management during the December 1, 1992 exit meeting. The licensee acknowledged the inspector's request and indicated that they were working to complete this LER and reduce the backlog. This item is closed.

d. (Closed) Followup Item (50-361/90-43-03), "Retest Requirements For Diesel Generator Lube Oil Pump."

This issue concerned post-maintenance test (PMT) requirements for work performed on Unit 2 emergency diesel generator 2G003 engine 2 AC lube oil pump. In particular, the inspector noted that the retest requirements were specified in a number of documents such as the work authorization record (WAR) and several maintenance orders (MOs).

Discussions with the licensee indicated that maintenance has their own retest requirements established in procedures. Additional retest items can be included by the planner (from the retest manual) or by the cognizant engineer in an MO, or by Operations in the WAR. In addition, a retest committee is convened to verify or establish retest requirements if deemed necessary.

Further evaluation of the condition by the inspector indicated that very few of the errors in the past year were the result of inadequate retesting. The licensee planned to continue retest committee meetings until a better method of documenting test requirements can be developed. The inspector considered that the licensee's retest requirements have improved based on the reduced error rate, and will continue to monitor the effectiveness of PMT as part of the routine inspection effort. This item is closed.

e. (Closed) Followup Item (50-361/91-09-01), "Followup On Motor Operated Valve Design Pressure Testing For CCW Valve."

This item identified that a safety evaluation for a design change to the component cooling water (CCW) system did not address the potential for a critical crack developing during the time both CCW trains were cross connected through the non-critical loop. After the concern was raised, the licensee evaluated the condition and resolved the issue in a 10 CFR 50.59 evaluation dated March 14, 1991. However, the inspector remained concerned that the motor



operated valves may not be able to operate if the differential pressures following a break in the piping were excessive.

The inspector noted that the main non-critical loop isolation valves are air operated butterfly valves that close on a containment isolation actuation signal (CIAS), or on a low-low level in the CCW surge tanks. However, there are other isolation valves (e.g., HV 6211, 6216, 6236, and 6223) that are also required to close on a CIAS. These valves are motor operated butterfly valves. The licensee indicated that these valves have not been tested in accordance with Generic Letter (GL) 89-10, "Motor-Operated Valve Testing and Surveillance," requirements. The NRC recently granted the licensee approval to complete testing in accordance with GL 89-10 at the end of the Cycle VIII refueling outages for Units 2 and 3. However, the current plan is to test the Unit 3 valves during the upcoming Cycle VII refueling outage, and the Unit 2 valves during the Cycle VIII refueling outage.

The inspector noted that until these valves are tested in accordance with the GL, the licensee plans to continue maintaining the effected valves in a limit opening and closing mode. The torque switches are also electrically connected and provided with a specific dial setting (which corresponds to an appropriately calculated torque value). The licensee indicated that they believed that there was reasonable assurance that these valves would operate as expected since other similar motor operated butterfly valves have generally had a wide margin of capability to operate against maximum system design pressure. This item is closed.

f. (Closed) Followup Item (50-361/92-12-03). "Unit 2 Pressurizer Nozzle Repair Evaluation."

As a result of pressurizer nozzle leakage in Unit 3 (as discussed in NRC Inspection Report 50-361/92-06), the Unit 2 pressurizer was visually inspected during a shutdown to test safety injection valves to determine if any signs of instrument nozzle degradation were present. During that inspection, the licensee found signs of very minor nozzle leakage at two locations.

The licensee began work on an engineering evaluation to clarify their position regarding continued operation of Unit 2 and Unit 3. The evaluation was being performed to document the licensee's position on the failure mechanisms, and to evaluate the various nozzle applications which had not been specifically inspected. However, the pace in performing the evaluations appeared to be slow at the time.

Based on the inspector's concerns about timeliness, the licensee completed the evaluation of this subject on June 19, 1992. The assessment indicated that the postulated pressurizer nozzle leakage was bounded by the Final Safety Analysis Report small break loss of

coolant accident analysis. Additionally, it stated that the reactor pressure vessel, reactor coolant system piping, and steam generator concerns were also bounded by the pressurizer assessment.

The licensee indicated that the Combustion Engineering (CE) Owners Group had evaluated each CE plant for susceptibility to the phenomenon. After discussion with CE, the licensee completed an additional assessment of the conditions as discussed in a November 20, 1992 memorandum. In that effort, the licensee indicated that primary water stress corrosion crack propagation rate is related to the yield strength of the material raised to the fourth power. Thus, nozzles with lower yield strength would be subject to a reduced crack propagation rate. The operability assessment concluded that there was no increased risk from this condition and that the two temporary repairs to the upper pressurizer nozzles in Unit 2 would be replaced by a permanent configuration during the upcoming Cycle VII refueling outage. This item is closed.

- g. (Closed) Followup Item (50-206/92-26-02). "Unit 1 No. 1 Battery Switchgear Room Elevated Temperatures."

NRC Inspection Report 50-206/92-26 documented concerns which resulted from the loss of the Number 1 battery switchgear room air conditioner (AC) in Unit 1. One concern was that Operations personnel were not aware that there were temperature limitations for equipment installed in that room.

As a result of the inspector's concerns, the Nuclear Engineering and Construction (NEC) Manager committed to perform an evaluation of a 1985 vendor calculation to determine the temperature profile for the battery switchgear room. Concurrent with NEC efforts, Unit 1 Operations personnel revised Abnormal Operating Instruction (AOI), S01-21.4-5, "Loss of Switchgear room HVAC (Heating, Ventilating, and Air Conditioning)," to provide guidance for mitigating the loss of AC to the battery switchgear room. Additionally, the operator shiftly rounds sheet was modified to include daily monitoring of the battery switchgear temperature.

As a result of the review, NEC determined that there was a higher heat input to the room than was documented in the vendor calculation. In addition, NEC concluded that the room temperatures could exceed equipment qualification temperatures (assuming maximum heat input during Mode 1 operations). However, the calculation was performed with the assumption that outside ambient temperature was constant. In effect, this was conservative since ambient temperature changes throughout the day. NEC personnel stated that to determine the room temperature profile with greater certainty would require a more rigorous calculation. They would have to model ambient temperature changes with the time of day and more accurately account for heat loss from the battery charger which has its own exhaust system. The NEC personnel indicated that such a calculation

would involve the expenditure of considerable resources. Since the Unit was to be permanently shutdown, there was no benefit to pursuing the issue further.

Evidence to support the conservatism of the calculation performed by NEC was observed on November 20, 1992. At that time, operators secured the AC unit to the room because it had become frozen. Over a two and one-half hour period, the actual temperature in the room increased approximately 7°F. This corresponded to an actual heat up rate of 2.8°F per hour. However, the model developed by the NEC predicted a heat up rate of 4-5°F per hour.

On November 30, 1992, Unit 1 was permanently shutdown. Until approximately mid-January 1993, the Unit will be maintained in Mode 5. The heat input to the room at that time is expected to be approximately one-half of that encountered during Mode 1 operations. After mid-January, the licensee will initiate efforts for permanent shutdown of Unit 1 which will further reduce heat generated in the battery switchgear room.

The inspector observed that compensatory actions were set in place to preclude the room temperature from exceeding 104°F (equipment qualification temperature). These actions will be maintained until there is no more need for forced spent fuel pool cooling in the Unit. The inspector also noted that the licensee believed that the original calculational weakness would have been identified in the design basis reconstitution effort which was suspended when the licensee decided to permanently shutdown Unit 1. The inspector considered that the licensee's actions were appropriate. Therefore, this item is closed.

No violations or deviations were identified.

#### 7. Exit Meeting

On December 1, 1992, an exit meeting was conducted with the licensee representatives identified in Paragraph 1. The inspectors summarized the inspection scope and findings as described in the Results section of this report.

The licensee acknowledged the inspection findings and noted that appropriate corrective actions would be implemented where warranted. The Station Manager committed to performing monthly observations of piping in a trench from the Unit 1 auxiliary feedwater tank that will be used as a makeup water source to the Unit 1 spent fuel pool (Paragraph 4).

The licensee did not identify as proprietary any of the information provided to or reviewed by the inspectors during this inspection.