

U.S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-206/88-22, 50-361/88-23, 50-362/88-25

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

License Nos. DPR-13, NPF-10, NPF-15

Licensee: Southern California Edison Company
P. O. Box 800, 2244 Walnut Grove Avenue
Rosemead, California 92770

Facility Name: San Onofre Units 1, 2 and 3

Inspection at: San Onofre, San Clemente, California

Inspection conducted: August 17, 1988 through September 24, 1988

Inspectors:

C. W. Caldwell FOR 10/12/88
F. R. Huey, Senior Resident
Inspector, Units 1, 2 and 3 Date Signed

C. W. Caldwell FOR 10/12/88
J. E. Tatum, Resident Inspector Date Signed

C. W. Caldwell FOR 10/12/88
A. L. Hon, Resident Inspector Date Signed

Approved By:

C. W. Caldwell FOR 10/12/88
P. H. Johnson, Chief Date Signed
Reactor Projects Section 3

Inspection Summary

Inspection on August 17, 1988 through September 24, 1988 (Report Nos. 50-206/88-22, 50-361/88-23, 50-362/88-25)

Areas Inspected: Routine resident inspection of Units 1, 2 and 3 Operations Program including the following areas: operational safety verification, radiological protection, security, evaluation of plant trips and events, monthly surveillance activities, monthly maintenance activities, refueling activities, licensee events report review, and follow-up of previously identified items. Inspection procedures 30703, 40700, 61705, 61706, 61707, 61708, 61710, 61726, 62700, 62703, 71707, 71709, 71710, 71711, 71881, 72700, 90712, 92700, 92701, 93702 were covered.

Safety Issues Management System (SIMS) Items: None

Results:

General Conclusions and Specific Findings:

The primary effort of this inspection involved follow up on previously identified open items. Resident inspection of routine licensee activities identified no significant problems.

Significant Safety Matters: None

Summary of Violations: None

Open Items Summary:

During this report period, no new items were opened, 31 items were closed, and two items were examined and left open.

DETAILS

1. Persons Contacted

Southern California Edison Company

- C. McCarthy, Vice President, Site Manager
- *H. Morgan, Station Manager
- D. Heinicke, Deputy Station Manager
- D. Schone, Quality Assurance Manager
- D. Stonecipher, Quality Control Manager
- R. Krieger, Operations Manager
- D. Shull, Maintenance Manager
- J. Reilly, Technical Manager
- P. Knapp, Health Physics Manager
- D. Peacor, Emergency Preparedness Manager
- P. Eller, Security Manager
- *J. Reeder, Operations Superintendent, Unit 1
- *V. Fisher, Operations Superintendent, Units 2/3
- L. Cash, Maintenance Manager, Unit 1
- R. Santosuosso, Maintenance Manager, Units 2/3
- C. Chiu, Assistant Technical Manager
- *M. Wharton, Assistant Technical Manager
- *C. Couser, Compliance Engineer

*Denotes those attending the exit meeting on September 23, 1988.

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 operated at power throughout this report period.

Unit 2

The Unit operated at power throughout the period, with the exception of the period from August 21 through August 23, during which the Unit was shutdown to repair a safety injection tank relief valve.

Unit 3

The Unit began power operation on August 18, 1988, following the Cycle 4 refueling outage. The Unit operated at power for the remainder of the report period except for a short maintenance outage from August 26 to August 27, 1988 to repair a feedwater heater tube leak.

3. Operational Safety Verification (40700, 71707)
Radiological Protection (71709)
Security (71881)

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.

a. Performance of Valve Alignments

During observation of licensee valve alignment activities at Unit 1 and Unit 3, the inspector noted several concerns:

- (1) During air rolling of the Unit 1 emergency diesel generator (D/G) as performed in accordance with station procedure S01-10-1, "Diesel Generator Operations," the inspector noted that the operators did not have a copy of the procedure in their possession. Although the operators properly performed all of the required steps in this procedure, the inspector was concerned that there was no copy of the "Diesel Air Roll Component Control Form" available at the job site for work control or to document the proper repositioning of the engine cylinder compression release valves. When the inspector questioned the operators about use of the component control form, they indicated that the form would be filled out in the control room after completion of the air rolling evolution.

As a result of the observation of the D/G air rolling activities, the inspector expressed the concern to the Station Operations Manager. The inspector pointed out that SCE operators have experienced similar problems in the past when procedures were available at the job site, but not checked off in a line-by-line manner. In particular, last year, Unit 1 operators inadvertently failed to properly close the D/G compression release valves following an air roll, which subsequently resulted in the D/G's failure to pass its starting surveillance. In addition, earlier this year, Unit 3 operators improperly returned a containment cooler to service with the drain valves open as a result of not having the procedure on-hand.

The Operations Manager agreed that operators should carry valve alignment sheets with them and sign them off as they are performed. He stated that the necessity for doing so would be reviewed with plant operators.

- (2) During a discussion with the Unit 1 Operations Superintendent, the inspector noted that many additional backup nitrogen system bottles were recently installed. The inspector questioned how

these bottles were being maintained. During the discussion, the Operations Superintendent stated that the bottles were exchanged and valved into the back-up nitrogen header by maintenance personnel.

The inspector noted that this practice was not consistent with station procedures which specified that only qualified operators were allowed to perform or independently verify system alignments. The inspector reviewed this concern with the station Operations Manager, who agreed to address this problem.

- (3) The inspector reviewed plant system alignments associated with the return of Unit 3 to operation following the Cycle 4 refueling outage. During that review, the inspector noted that station procedures did not specifically require a complete alignment check of plant systems following a major outage. The procedures for return to service from a major outage were the same as for a minor outage, in that the decision on the scope of specific plant alignment requirements was left to the Unit Superintendent. A review of alignments performed in conjunction with Unit 3 return to service indicated that operators performed at least a one party alignment check on all plant systems. The inspector identified the concern that minimum system alignment requirements following major plant outages should be incorporated into applicable station procedures. The station operations manager agreed to evaluate the need for such a change.

This item is closed (50-206/88-22-01).

b. Protection of Back-up Nitrogen System Lines (Unit 1)

As noted above, numerous additional back-up nitrogen systems were recently installed in the plant. During tours of work areas in the plant, the inspector observed instances in which scaffolding and mobile tool carts were left adjacent to the relatively fragile tubing installed in these systems. The inspector requested that the licensee consider the need for additional emphasis on protection of these lines from potential damage.

This item is closed (50-206/88-22-02).

c. Inadequate Control of Radioactive Material (Unit 2)

During a tour of the Unit 2 auxiliary feedwater pump room, the inspector found an unsecured magenta bag of radioactive waste material. The bag was located outside of the contaminated area boundary that surrounded the refueling tank sump pump area. The inspector notified the health physics foreman who initiated action to correct the deficiency.

This item is closed (50-361/88-23-01).

No violations or deviations were identified.

4. Evaluation of Plant Trips and Events (93702)

Plant Shutdown on August 21, 1988 to Repair Safety Injection Tank Relief Valve (Unit 2)

On August 21, the licensee declared an Unusual Event due to an unplanned shutdown, resulting from an inoperable safety injection tank (SIT). During a routine operation to increase the nitrogen pressure in SIT #7, the relief valve lifted prematurely and decreased the SIT pressure to below the Technical Specification limit. The licensee initiated a plant shutdown after several unsuccessful attempts to seat the relief valve. During repair of the valve, the licensee found a rough machined surface on the valve stem guide. The licensee determined that, due to the relative motion between the stem and the guide, a varying amount of friction force (combined with the spring force) caused the valve actuating setpoint to change. The plant returned to power operation on August 23, following repair and testing of the valve. The licensee planned to inspect other SIT relief valves during future outages for both Unit 2 and 3. Licensee event report (LER) 50-361/88-22 was submitted by SCE to report this event.

No violations or deviations were identified.

5. Monthly Surveillance Activities (61726)

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

a. Observation of Routine Surveillance Activities (Unit 1)

- S01-12.8-20 (TCN 1-7) Auxiliary Feedwater System Operability Test
- S01-12.9-01 (TCN 5-9) Diesel Generator Operability Test
- S01-12.3-02 (TCN 4-6) Hot SI and Containment Spray Test

b. Observation of Routine Surveillance Activities (Unit 2)

- S023-II-5.5 (TCN 10-3) Surveillance Requirement N.I. Safety Channel A Drawer Test Linear Power Subchannel Gains Channel Functional Test and Channel Calibration (Thirty-One Day Interval, S/U)
- S023-3-3.29 (TCN 6-4) Determination of Reactor Shutdown Margin
- S023-V-3.4.1 (TCN 5-1) Auxiliary Feedwater Inservice Pump Test

- S023-V-3.4.1 (TCN 5-1) Auxiliary Feedwater Inservice Pump Test
- c. Observation of Routine Surveillance Activities (Unit 3)
 - S023-3-3.20 (TCN 7-5) Monthly Control Room Emergency Air Cleanup Test
 - S023-3-3.29 (TCN 6-4) Determination of Reactor Shutdown Margin

No violations or deviations were identified.

6. Monthly Maintenance Activities (62700, 62703)

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

- a. Observation of Routine Maintenance Activities (Unit 1)
 - MO 87101434 Lubrication and Inspection of Steam Driven Auxiliary Feedwater Pump G10
 - MO 88090763 Troubleshooting Battery Charger D Indication Light Failure
 - MO 88082629 Reactor Plant Instrumentation Testing and Calibration
- b. Observation of Routine Maintenance Activities (Unit 2)
 - MO 88091103 Failure of CEAC #1 Position Indication for CEA #36
 - MO 88061589 Outboard Packing Leak on Motor Driven Auxiliary Feedwater Pump 2P-141
 - MO 88020326 Install Custom Washers for Motor Driven Auxiliary Feedwater Pump 2P-141 Hold Down Bolts
 - MO 88080979 Saltwater Cooling Pump 2P-112 Feeder Breaker PMs
- c. Observation of Routine Maintenance Activities (Unit 3)
 - MO 88081519 Troubleshoot High Containment Pressure Pretrip Annunciator 3UI91524
 - MO 87100558 Reactor Trip Breaker (Serial #256A4002-656-26) Maintenance

No violations or deviations were identified.

7. Engineered Safety Feature Walkdown (71710)

The inspector performed a walkdown of the Unit 3 containment isolation system and the DG 3G003 prior to the unit mode change after the refueling outage.

No violations or deviations were identified.

8. Refueling Activities (60705, 60706, 60707, 60708, 60710, 71711, 72700) (Unit-3)a. Refueling Startup

Following the refueling and related outage, the unit entered mode-4, mode-3, mode-2 and mode-1 on August 8, 12, 16 and 18, respectively. The unit was synchronized to the grid on August 20 which completed a 112 day refueling outage.

The inspector reviewed the licensee's control for returning the required systems to an operable status prior to each mode escalation by using the limiting condition for operation action requirement (LCOAR) and the equipment deficiency mode restraint (EDMR). The inspector independently walked down DG 3G003 and the containment isolation system after they were returned to service following maintenance activities.

The inspector also witnessed the following startup evolutions and tests were conducted according to the procedures:

- S023-3-1.1 TCN 9-10 Reactor Startup
- S023-V-1.0 TCN 9-2 Low Power Physics Testing
- S023-V-1.0.1 TCN 1-1 Criticality Following Refueling
- S023-V-1.0.2 Rev 2 Boron Endpoint Determination
- S023-V-1.0.6 Rev 3 Control Element Assembly Worth by Exchange

b. Startup Testing Data Review

The inspector reviewed the test results of the Unit 3 startup testing conducted following the cycle IV refueling outage. Data taken during performance of the following procedures:

- S023-V-1.0 TCN 9-2 Low Power Physics Testing
- S023-V-1.0.1 TCN 1-1 Criticality Following Refueling
- S023-V-1.0.2 Rev 2 Boron Endpoint Determination
- S023-V-1.0.3 Rev 3 Isothermal Temperature Coefficient Measurement at Hot, Zero Power
- S023-V-1.0.5 Rev 3 Control Element Assembly Worth by Boration/Dilution
- S023-V-1.0.6 Rev 3 Control Element Assembly Worth by Exchange

- S023-V-1.0.7 TCN 2-1 Determination of Neutron Flux Level for Low Power Physics Testing
- S023-V-1.10 TCN 5-1 Reactivity Computer Installation and Alignment
- S023-V-1.12 Rev 10 Power Distribution Monitoring
- S023-V-1.18 TCN 3-2 NSSS Calorimetric
- S023-V-1.19 TCN 4-1 Nuclear and Thermal Power Calibration
- S023-V-1.19.1 Rev 2 Excore Log Power Calibration
- S023-V-1.20 Rev 4 RCS Calorimetric Flow Measurement
- S023-V-1.21 TCN 1-2 Core Performance Record
- S023-V-1.25 TCN 1-1 Process Variable Cross Comparison
- S023-V-2.6 TCN 3-1 Power Ascension Testing Using the CEFAS Method
- S023-V-3.2.5 TCN 3-1 Refueling Interval Temperature Sensor Calibration

No violations or deviations were identified.

9. Review of Licensee Event Reports (90712, 92700)

Through direct observations, discussion with licensee personnel, or review of the records, the following Licensee Event Reports (LERs) were closed:

Unit 1

- 87-08 Kapton Insulation Damage
- 88-03 R1 Safety Injection System Suction Piping Boron Concentration Requirements
- 87-11 Containment Isolation System Train A Actuation Due to Loss of Power to Vital Bus #1
- 87-11 R1 Containment Isolation System (CIS) Train "A" Spurious Actuation
- 88-12 Feedwater Flow Indication Erroneous Leading to Offset Between Indicated Power and Real Power
- 88-13 Technical Specification 3.0.3 Entry to Adjust CV-875-A

Unit 2

- 86-32 Spurious TGIS Actuations
- 86-34 ESF Actuation during Planned Maintenance
- 88-04 R1 Spurious CRIS
- 88-19 18 Month 125 Volt Battery Service Test Inadequate Due to an FSAR Inconsistency
- 88-20 Control Room Isolation System Train B Spurious Action Due to Procedure Inadequacy
- 88-21 Failure of RCS Hot Leg Sample Valve 2HV-0508
- 88-22 Plant Shutdown Due to Inoperable SIT Relief Valve

Unit 3

- 84-02 Misalignment of CEA 64
- 85-01 Shutdown Due to Unidentified Leakage from Spray Valve Packing in Excess of 1 gpm
- 85-13 Reactor Trip Following Failed Hydrogen Seal Oil Pipe Fitting
- 85-30 Spurious FHIS
- 87-11 R2 Reactor Trip on Low Steam Generator Water Level
- 88-06 Containment Purge Isolation System (CPIS) Actuation While Transporting Radioactive Material Near CPIS Monitor
- 88-07 Delinquent Inservice Test (IST) of Component Water Check Valve Due to Personnel Error

No violations or deviations were identified.

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

- a. (Closed) Violation (50-206/86-07-01) Failure to Implement Effective IST Program for Check Valves

To implement the response to the violation, the licensee initiated an IST program for all check valves associated with the auxiliary feedwater system and the related main feedwater system. This program included the implementation of new procedures S01-V-2.15 "Inservice Testing of Valves Program", S01-SPE-690 "Inservice Testing of Auxiliary Feedwater System Check Valves" and S01-SPE-691 "Inservice Testing of Main and Auxiliary Feedwater System Check Valves." These procedures listed all affected check valves to be tested and the acceptance criteria for them.

Testing of Auxiliary Feedwater System Check Valves" and S01-SPE-691 "Inservice Testing of Main and Auxiliary Feedwater System Check Valves." These procedures listed all affected check valves to be tested and the acceptance criteria for them.

The inspector noted that the testing program included a requirement for in-leakage testing of the selected check valves when the unit will be in cold shutdown for more than 90 days. It also included the disassembly and inspection of the two check valves on the main feedwater pump discharge during refueling outages. Some of the check valves were tested for in-leakage during the last two mid-cycle outages conducted in 1987 and 1988. The inspector also noted that the two check valves on the main feedwater pump discharge will be inspected during the upcoming refueling outage in November 1988.

The licensee's corrective actions appeared to be satisfactory. Therefore, this item is closed.

b. (Closed) Open Item (50-206/87-14-02) Problems with Kapton Insulation

This item involved observed deterioration of Kapton insulation associated with Conax containment electrical penetrations. The inspectors requested that NRR review the Kapton degradation problems experienced at San Onofre as a potentially generic concern.

NRR personnel had numerous discussions with the licensee and Conax vendor personnel and concluded that, although the Kapton deterioration problem was not believed to be wide spread, NRR planned to issue an NRC information notice or individual letters to potentially affected NRC licensees.

This item is closed.

c. (Closed) Violation (50-206/88-03-04) Improper Safety System Operability Determination

This item involved failure of plant operating personnel to perform a proper operability assessment associated with leakage and depressurization of backup nitrogen cylinders for auxiliary feedwater system flow regulating valves.

The inspector reviewed the licensee's evaluation of the root cause of this event which identified that the operating procedure for maintaining the backup nitrogen system was not clear with regard to the specific actions required for proper maintenance of all portions of the backup nitrogen system. However, the major problem was concluded to involve an inadequate understanding of the system design basis by cognizant plant personnel. For corrective action, the licensee has taken steps to revise applicable procedures to more clearly define system requirements and has initiated an engineering review of the design basis for the backup nitrogen system. This review identified the need for several system modifications which were being installed in the plant. In addition, all applicable

design requirements were being incorporated into appropriate operating procedures and personnel training requirements.

The inspector considered that the licensee's actions were adequate. Therefore, this item is closed.

d. (Closed) Part 21 (50-206/86-20-P) Foxboro E and H Series Controllers Degradation

This Part 21 report was also the subject of IE Information Notice 86-52. For corrective action the licensee issued nonconformance report (NCR) S01-P-5930 in May 1987 to resolve the wiring degradation. As a result, the affected wires were identified and replaced.

With respect to the potentially degraded capacitors identified by Foxboro, the licensee took action to identify the affected components in the plant and generated maintenance orders (MOs) for their replacement during the upcoming refueling outage scheduled for November, 1988.

This item is closed.

e. (Closed) IE Bulletin (IEB 85-03) Motor Operated Valve Common Mode Failure Concerns

NRR reviewed the August 21, 1987 licensee response to IEB 85-03. The NRR review concluded that the licensee's selection of the applicable safety related valves, the valves' maximum differential pressures and the licensee's program to assure valve operability, as requested by action item (e) of the bulletin, was acceptable.

Therefore, this item is closed.

f. (Closed) Temporary Instruction 2515/92 (50-206, 50-361 and 50-362/15-92-T) Emergency Operating Procedure Team Inspection

This Temporary Instruction identified that an inspection of emergency operating procedures (EOPs) was to be conducted for several selected plants of which Unit 2 was one. The team inspection was conducted during June 10-13, 1988 with resident inspector participation. The results of this inspection were documented in report 50-361/88-13 and 50-362/88-14.

All action items were completed during that inspection. Therefore, this item is closed.

g. (Closed) Open Item (361/87-13-02) Development of Safety System Availability Performance Indicator

This item involved licensee evaluation of the benefit of developing a plant performance indicator to track important safety system availability. The licensee implemented a pilot program sponsored by the Institute for Nuclear Power Operations (INPO) to track safety

h. (Open) Open Item (361/87-20-01) Steam Driven Auxiliary Feedwater Pump 2P-140 Speed Control Deficiency

This item remains open pending additional evaluation by the licensee.

i. (Open) Violation (362/85-26-02) Improper Routing of Temporary Electrical Circuits

This item remains open pending additional NRC review of the licensee's criteria for separation and isolation of temporary electrical circuits from Class 1E electrical circuits.

j. (Closed) Part 21 Report (362/86-15-P) MOV Insulation Problems

Trojan Nuclear Plant identified that Limitorque nuclear grade D.C. motor lead wire insulation was susceptible to damage during field installation. This condition was reported to the NRC in Part 21 Report 50-344/86-01. Following this report, Limitorque determined that the insulation used on motors manufactured during the December 1984 through December 1985 time period was subject to failure. In addition, the NRC issued Information Notice 87-008 to address this concern.

Based on a review of the licensee's documented actions to address the concerns, the inspector observed that none of the suspect Limitorque D.C. motors were installed in the plant and suspect replacement motors were quarantined pending resolution of this problem. The licensee's actions appeared to be acceptable.

This item is closed.

k. (Closed) Unresolved Item (362/86-38-03) Inadequate Program for Documentation and Review of As-Found Data

Previously, the inspector identified that the licensee's program for identifying and evaluating as-found data was not well defined. As a result, the licensee's QA organization issued Problem Review Report (PRR) SO-078-87 to evaluate this concern. The inspector reviewed the PRR response (Rev 2) submitted by Station Technical and the memorandum issued by Site QA on August 31, 1988, which provided clarification of the response. The inspector noted that the licensee implemented requirements for recording as-found data and criteria were established for trending and evaluating this data. The licensee's actions on this matter appeared to be acceptable.

This item is closed.

1. (Closed) Open Item (50-362/87-22-01) Gas Binding of CCW Pump P-025

During inservice testing (IST) of component cooling water (CCW) pump 3P-025, the licensee identified that the pump had previously become air bound during idle conditions. As a result, the pump discharge valve was disassembled for inspection. The licensee initially concluded that foreign material was present on the valve seating surfaces, which prevented the valve from seating tightly. As component cooling water (CCW) leaked past the closed valve, nitrogen came out of solution and collected in the pump casing.

As followup to this concern, the inspector observed that the foreign material was not specifically identified and the consequences of this material on the CCW system were not discussed in the initial engineering evaluation. In addressing the inspector's concerns, the licensee concluded that the foreign material found on the valve seating surfaces was a thin film of corrosion products normally present in the CCW system. For additional action, the licensee has continued to monitor the CCW pumps. However, no additional signs of gas binding have been identified.

This item is closed.

No violations or deviations were identified.

12. Exit Meeting (30703)

On September 23, 1988, 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 licensee did not identify as proprietary any of the information provided to or reviewed by the inspectors during this inspection.