

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-206/88-12, 50-361/88-09, 50-362/88-09  
Docket No. 50-206, 50-361, 50-362  
License No. 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: April 4 through April 8, 1988

Inspector: C. W. Caldwell 5/2/88  
C. W. Caldwell, Project Inspector Date Signed

Approved By: P. H. Johnson 5/2/88  
P. H. Johnson, Chief, Date Signed  
Reactor Projects Section 3

Inspection Summary:

Inspection on April 5 - April 8, 1988 (Report No. 50-206/88-12)  
50-361/88-09, 50-362/88-09

Areas Inspected: Routine unannounced regional inspection of followup on vendor-related modifications for reactor trip breakers, surveillance testing and calibration program (Units 2/3 only), maintenance program implementation (Unit 1 only), inspector followup items, and followup on items of non-compliance. Inspection procedures 25591, 61725, 62700, 92701, 92702, and 30703 were covered.

Safety Issues Management System (SIMS) Items:

(Closed) Multiplant Action (MPA) B-80 - Inspection Followup to Generic Letter 83-28, Vendor-Related Modifications to Reactor Trip Breakers

Results: No violations or deviations were identified. One inspector followup item (Paragraph 4) concerning the amount of time to implement a design change was identified. In addition, two followup items, two unresolved items, and two violations were closed.

In general, the licensee's programs for surveillance testing and calibration, and maintenance were fully implemented. Enhancements were being made in the areas of out of calibration tolerance testing and reliability centered maintenance (to optimize the preventive maintenance program) to make the maintenance program more effective.

## DETAILS

### 1. Persons Contacted

#### Licensee Personnel

- \*C. B. McCarthy, Vice President and Site Manager
- \*H. E. Morgan, Station Manager
- \*R. W. Krieger, Operations Manager
- \*R. N. Santosuosso, Units 2/3 Maintenance Manager
- \*L. O. Cash, Unit 1 Maintenance Manager
- \*D. E. Shull Jr., Maintenance Division Manager
- \*J. T. Reilly, Station Technical Manager
- \*D. B. Schone, Site QA Manager
- \*M. A. Wharton, Assistant Technical Manager
- \*J. C. Shields, Assistant M&A Manager
- \*D. A. Herbst, ISEG Supervisor
- \*R. C. Clark, Balance Of Plant Supervisor
- \*J. P. Shipwash, Compliance Supervisor
- \*N. R. Dickinson, Project Site Technical Services Supervisor
- \*C. A. Couser, Compliance Engineer
- \*G. L. Johnson, QA Engineer
- \*S. W. McMahan, Maintenance Supervisor
- \*J. W. Winter, Engineer
- \*W. G. Zintl, Nuclear Training
- \*M. E. Anderson, Station Technical Engineer
- \*N. Maringas, ISEG Engineer

#### NRC Personnel

- \*F. R. Huey
- \*J. E. Tatum
- \*A. L. Hon

\*Denotes those attending the final exit meeting on April 8, 1988.

The inspector also contacted licensee operators, engineers, technicians, and other personnel during the course of the inspection.

### 2. (Closed) Inspection Followup to Generic Letter 83-28, Item 4.1, Multiplant Action (MPA) B-80, "Inspection Followup on Vendor-Related Modifications for Reactor Trip Breakers" (25591)

The inspector reviewed the licensee's actions required by Item 4.1 of Generic Letter (GL) 83-28 "Required Actions Based on Generic Implications of Salem anticipated transient without scram (ATWS) Events." In particular, Item 4.1 specified that: (1) vendor-recommended reactor trip breaker modifications and associated reactor protection system changes be completed, (2) a comprehensive program of preventive maintenance and surveillance testing be implemented for the reactor trip breakers, (3) the shunt trip attachment activate automatically in all PWRs that use circuit breakers in their reactor trip system, and (4) on-line functional testing of the reactor trip system be performed.

Region V originally reviewed the licensee's response to GL 83-28 and inspected the licensee's program for maintenance and surveillance testing in accordance with GL 83-28 in October 1984. The results of that review were documented in inspection report 50-206/84-27.

During this inspection period, the inspector performed a brief review of the documentation used to implement the design changes and reviewed procedures to ensure that they adequately addressed surveillance and maintenance requirements for the reactor trip breakers. This was done by review of the design change package and procedure revisions for the changes that were made to the Unit 1 Westinghouse DB-50 Reactor Trip Breakers and the documentation that was used to perform the design change package for the Unit 2/3 General Electric AK 2-25 Reactor Trip Breakers. In addition, the inspector reviewed procedures that were used for maintenance on these breakers.

Required modifications to the Unit 1, Westinghouse DB-50 reactor trip breakers were documented in Westinghouse letter NCD-ELEC-18. These changes were provided to the plant in Design Change 72-5. The design change package specified that the following modifications had been made to the undervoltage (UV) attachments supplied by Westinghouse:

- The radius at the base of the reset lever arm had been relieved.
- The trip lever U-plate was provided with revised centering spacers.
- Additional polishing of the latch faces was incorporated.
- A dimensional change to the armature rod was made.

The inspector found that the documentation used to implement the design change contained appropriate approvals by responsible personnel to implement the design change. A safety evaluation was performed on this modification that identified that it did not involve an unreviewed safety question and did not involve a change in the Technical Specifications (TS).

The inspector reviewed documentation on file that indicated the scope of the design change for Units 2 and 3. Required modifications to the Units 2 and 3 General Electric AK 2-25 reactor trip breakers consisted of replacing a diode in the UV coil circuitry with a varistor. The varistor design change was intended to act as a surge suppression device for the breaker. In addition, it was identified that bearing replacement was necessary for the AK 2-25 breakers as evidenced by the number of bearing problems/repairs to these breakers. These modifications were subsequently made in 1984 and 1985.

The inspector reviewed the following repetitive (preventive) maintenance procedures:

- S01-I-4.58, Revision 2, "Breakers - Scram Breaker Inspection, Lubrication, Adjustment, And Test"

- S023-I-9.27, Revision 1, "Breaker - GE AK-2-25 Reactor Trip Breaker Inspection, Adjustment, And Testing"
- S01-II-2.44, Revision 4, "Surveillance Requirement - Reactor Breakers Undervoltage And Shunt Trip Device Circuit Test"
- S023-II-11.161, Revision 5, "Surveillance Requirement, Reactor Breakers Undervoltage And Shunt Trip Device Circuit Test"

The inspector found that procedures S01-I-4.58 and S023-I-9.27 provided in-depth details for personnel to inspect, clean, adjust, lubricate, and test the Westinghouse DB-50 and GE AK 2-25 reactor trip circuit breakers. In addition, procedures S01-II-2.44 and S023-II-11.161 provided details to test the undervoltage and shunt trip devices. Procedure S023-II-11.161 had provisions for on-line testing of the Units 2 and 3 circuit breakers. However, procedure S01-II-2.44 did not allow for on-line testing of the Unit 1 circuit breakers. The inspector noted that this has been previously identified. Discussions have been underway between Edison and the NRC staff concerning the impact of modifications necessary to provide for on-line testing of the Unit 1 breakers. The inspector also reviewed several repetitive maintenance orders and verified that the preventive maintenance and surveillance requirements were accomplished at the required frequencies. The inspector considered that the licensee had performed the necessary modifications to the reactor trip breakers and that the necessary maintenance controls had been instituted to ensure that the breakers would function when required. The only remaining issue concerns the provisions for on-line testing of the Unit 1 reactor trip breakers. Therefore, this item will remain open for Unit 1, but is closed for Units 2 and 3.

No violations or deviations were identified.

3. Surveillance Testing and Calibration Program (Units 2 and 3) (61725)

The inspector reviewed the licensee's program for surveillance testing and calibration control. The purpose of this inspection was to ascertain the status and effectiveness of programs for the control and evaluation of surveillance testing, calibration, and inspection required by the TS; and calibration of safety-related instrumentation not specifically controlled by the TS.

This item was previously completed for Unit 1 and documented in inspection report 50-206/88-02. Since the programs are similar between Unit 1 and Units 2/3, the inspector performed a brief inspection of the implementation of the program for Units 2/3.

The inspector found that the licensee had established a master schedule for surveillance testing, calibration, and in-service inspection and testing of components included in the TS. The program was based upon a computerized maintenance management system for control of the performance of surveillances. The inspector selected approximately 20 surveillance tasks from the master schedule and verified that they were reviewed by responsible licensee management and that they were performed within the required TS frequency.

The inspector toured the plant and selected 10 components in safety-related systems that were not covered by TS to determine if the licensee had included these components in the surveillance program. The inspector found that periodic calibration requirements had been established for 7 of the 10 components that the inspector selected. Two of the components, pressure instruments for the auxiliary feedwater system chemical feeder and the flow indicator for pressurizer degasification system, were on the master computer surveillance list and had surveillance tasks associated with them. However, the surveillances were performed on an as-required basis based upon component performance. One component, an auxiliary feedwater system pressure gage for the root steam to eductor pressure, had no periodic calibration required. This component was on the licensee's master computer list of components, but the licensee indicated that they had evaluated the performance of this component and determined that a surveillance task was not necessary. The inspector noted that this instrument was not a direct readout instrument necessary for operator monitoring.

Based upon the items reviewed, the inspector considered that the licensee had implemented an effective program for performing surveillance testing and calibration control.

No violations or deviations were identified.

4. Maintenance Program Implementation (Unit 1) (62700)

The inspector reviewed the licensee's maintenance program to determine whether it was being implemented in accordance with regulatory requirements, to determine the effectiveness of the maintenance program on important plant equipment, and to determine the ability of the maintenance staff to conduct an effective maintenance program. This was performed by reviewing licensee corrective actions for component failures and by reviewing the licensee's trending programs.

The inspector selected 25 recent non conformance reports (NCRs) and 4 licensee event reports (LERs) dealing with component failures to determine if the licensee adequately evaluated the cause of the failure and to determine if corrective actions were proposed to reduce the probability of recurrence. The inspector reviewed the NCRs and LERs and discussed a number of the more significant ones with responsible licensee personnel.

The inspector found that the licensee had evaluated the problems and proposed corrective actions as necessary. In addition, safety evaluations were performed on these deficiencies when required. One example of an NCR and proposed corrective actions reviewed by the inspector dealt with a motor operated disconnect that failed to open electrically. Discussions with the licensee indicated that they had found that there were no preventive maintenance (PM) tasks associated with this disconnect. As part of the corrective actions, Edison initiated an evaluation to determine if a PM task should be implemented for this component. The evaluation response due date was May 23, 1988. The inspector found one NCR, S01-P-6052, that identified that a "containment spray flow low" annunciator circuit was

not wired in accordance with the wiring and elementary drawings. A design change, 79-09, had been proposed to correct this, but it had never been implemented. The inspector was concerned that it had been 9 years since the design change was proposed and that, as of this inspection, it had not been implemented. The inspector will review the licensee's reasons for not implementing this modification and it is identified as followup item (50-206/88-12-01).

The inspector reviewed the licensee's trending program of component failures. The inspector found that maintenance orders (MOs) were trended and that the program flagged components and systems that have had repetitive failures. In particular, systems were flagged if there were 40 failures per month, 60 failures per quarter, or 80 failures per year of components in that system. Also component failures were flagged if there were 6 failures per month, 9 failures per quarter, or 12 failures per year of that particular component or that generic type of component. The inspector noted that the licensee issued quarterly and yearly reports of trending results.

The inspector found that additional trending was being performed through the use of the nuclear plant reliability data system (NPRDS). The inspector noted that the NPRDS data base and utilization were fully implemented and that reports were made on a routine basis. The inspector questioned the licensee to determine if trending was performed on in-service inspection (ISI) program components and components that were out of calibration. Discussions with personnel responsible for the ISI program indicated that trending of ISI components was implemented and was in the process of being upgraded. The licensee also indicated that "Out Of Calibration Tolerance" trending for M&TE was in the process of being implemented. Edison personnel stated that the program will be implemented such that it will flag a component if there are 2 "out of calibrations" for that particular component or that generic type of component (e.g., Foxboro transmitters) over a period of time.

Discussions with the licensee also indicated that they were in the process of devising a Reliability Centered Maintenance Program to optimize the PM program. This would allow SCE to revise the PM program to switch from a time basis program to one that was based on component performance.

In general, the inspector considered that Edison personnel had implemented a program that performed adequate evaluations of component failures and provided corrective actions that would minimize the possibility of recurrence. In addition, the licensee had implemented an extensive trending program to track the number of component and system failures. The inspector will continue the review of the licensee's maintenance program implementation by observing the performance of maintenance activities in a future inspection.

No violations or deviations were identified.

5. Licensee Actions On Previous NRC Inspection Findings (92701)

a. (Closed) Followup Item (50-206/86-22-03), Followup of Licensee's Evaluation of Effects From Corrosion Products in the Primary

This item identified a concern over black sediment that was found on the Unit 1 upper core internals during the 1985/1986 refueling outage.

The inspector reviewed the licensee's analysis of the black sediment. The analysis indicated that the major constituent of the sludge was found to be iron oxide. It was determined that the iron-to-nickel ratio was much higher than would be expected if the sediment was just normal reactor coolant corrosion products. Based upon the tungsten content of the sludge, Westinghouse and the licensee determined that a large percentage of the sediment was the material that was used for grit blasting of the steam generators (S/G) during the 1980 S/G sleeving project. This hypothesis was reinforced by chemistry analyses performed since 1980, that showed a decrease in maximum suspended solids in the reactor coolant. The licensee's analysis indicated that any sediment that had not been removed was expected to settle at the bottom of the reactor vessel. In addition, the analysis stated that sediment at the bottom of the vessel would not block coolant flow through the core. Therefore, it was not a threat. The inspector considered that the licensee's evaluation was acceptable. Therefore, this item is closed.

b. (Closed) Followup Item (50-206/86-20-07), Operability of Leaking Battery

This item identified a concern that 125 VDC Battery Number 1 for Unit 1 may be inoperable as a result of pinhole leaks that had been discovered in battery jar covers.

The inspector reviewed an engineering evaluation that was performed to determine the ability of the battery to perform its intended function. Edison personnel had identified the leaks and issued an NCR in May 1985. A maintenance order (MO) was issued May 27, 1985 to have the vendor representative inspect the battery. However, due to a number of difficulties in scheduling, the inspection was not performed until April 8, 1986. At that time, the vendor representative stated that the problem was not serious and that the battery would perform its design duty function. Subsequent to that inspection, the licensee performed the 18 month service test on June 21, 1987. The results showed that the battery passed the service test and exceeded its service test profile. The inspector also noted that weekly and quarterly battery inspections were performed by the licensee that specifically checked electrolyte levels. In addition, battery watering information was maintained by SCE. Based upon these findings, the inspector considered that battery number 1 operability had been sufficiently demonstrated. Therefore, this item is closed.

c. (Closed) Unresolved Item (50-206/86-20-08), Adequacy of Battery Capacity Test

This concern dealt with the lack of use of a temperature correction factor "k" while performing a battery test discharge. In particular, startup test procedure S01-PE-82-1931-1, Revision 0, "125V DC Battery No. 1" did not include a temperature correction factor as recommended by IEEE Standard 450-1980.

The inspector reviewed the licensee's evaluation of this concern and found that Edison determined that not using the correction factor during the performance of this test made it a more conservative test. This was due to the fact that the battery was tested at a temperature that was higher than the reference value of 77 degrees (as temperature increases above the reference value, the specific gravity increases). Therefore, the test adequately demonstrated the battery operable. However, to ensure that subsequent tests would be satisfactory, the licensee issued procedure S0123-I-2.6, "Batteries - Battery Performance Tests" (that superseded S01-PE-82-1931-1) which incorporated the use of a temperature correction "k" factor. The inspector considered that the licensee's actions were adequate to resolve the concern. Therefore, this item is closed.

d. (Closed) Unresolved Item (50-362/86-38-05), Implementation of Fuel Particle Control Program

This item identified a number of discrepancies regarding the implementation of SCE's fuel particle control program in Unit 3. These discrepancies were identified shortly after implementation of the program. As a result of the discrepancies identified by the NRC, the licensee committed to improve implementation of the fuel particle program controls.

The inspector reviewed the licensee's evaluation of the discrepancies that were identified concerning the implementation of the fuel particle control program. In most cases, SCE acknowledged the discrepancies and corrected them. In some cases, the licensee determined that there was no problem and that no additional action was necessary. Edison also indicated that the program was upgraded as a result of additional lessons learned as the program implementation progressed. Therefore, the licensee considered that the implementation of the fuel particle control program was complete. The inspector attended fuel particle training (implemented subsequent to the expression of NRC concerns) and found that it provided detailed information concerning the fuel particle problem and controls that had been instituted as a result. Based upon the licensee's evaluation of the NRC concerns and the level of detail provided to personnel regarding control of fuel particles, the inspector considered that the licensee had taken appropriate actions to resolve the NRC's concerns. Therefore, this item is closed.

No violations or deviations were identified.

6. Licensee Action On Items of Non-Compliance (92702)

a. (Closed) Violation (50-206/87-10-01), Failure to Provide Adequate Procedure For I&C Maintenance

This item identified numerous deficiencies and inadequate acceptance criteria in the procedures and maintenance orders used to perform a calibration of source range monitor channel N-1201. In particular, procedure S01-II-1.6.3, Revision 1, "Source Range Channel N-1201" did not include acceptance criteria for the data recorded and the procedure required use of a ramp generator that was not included in the M&TE program.

The inspector reviewed the licensee's actions to correct the deficiencies identified. Procedure S01-II-1.6.3, Revision 2, was issued on August 12, 1987 to correct the problems. In particular, acceptance criteria for data were included in step 6.2.10.2 and step 6.4.5 and the ramp generator was included in the M&TE program. For additional corrective actions, SCE performed a review of other instrument and control (I&C) procedures to ensure that calibration equipment used was included as M&TE when appropriate. During this review, the licensee found that four other procedures required use of the ramp generator. These procedures were revised to ensure that the ramp generator met M&TE requirements. The inspector considered that the licensee's actions on this item were adequate. Therefore, this item is closed.

b. (Closed) Violation (50-206/87-10-02), Failure to Comply With I&C Procedures

This violation noted that maintenance procedure S01-II-1.6.3, Revision 1, "Source Range Channel N-1201" identified a pulse generator, pulse counter, and oscilloscope as M&TE. However, the technician using this equipment did not record this equipment on the maintenance order as required by the procedure.

To correct this procedural adherence problem, the licensee changed lesson plan MT 7515, (Technician Recent Plant Events), and lesson plan MT 7717, (Mechanical Recent Plant Events), to emphasize the need for personnel to follow procedures or to initiate a temporary change notice (TCN) if the procedure cannot be followed. The inspector considered that the licensee's actions were appropriate and that this item is closed.

No additional violations or deviations were identified.

6. Exit Meeting (30703)

On April 8, 1988, an exit meeting was held with the licensee representatives identified in paragraph 1. The inspector summarized the inspection scope and findings as described in this report. One followup item (Paragraph 4) concerning the amount of time to implement a design change was identified by the inspector. The licensee agreed to provide the inspector with information concerning the reasons for not implementing this design change.