

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 50-206/78-15

Docket No. 50-206 License No. DPR-13 Safeguards Group \_\_\_\_\_

Licensee: Southern California Edison Company  
2244 Walnut Grove Avenue  
Rosemead, California 91770

Facility Name: San Onofre Unit 1

Inspection at: San Onofre

Inspection Conducted: December 26-29, 1978

Inspectors: <u>H. L. Canter</u>	<u>January 18, 1979</u>
H. L. Canter, Reactor Inspector	Date Signed
<u>L. F. Miller</u>	<u>January 18, 1979</u>
L. F. Miller, Reactor Inspector	Date Signed
<u>D. P. Haist</u>	<u>January 18, 1979</u>
D. P. Haist, Reactor Inspector	Date Signed
<u>G. W. Johnston</u>	<u>1/18/79</u>
G. W. Johnston, Reactor Inspector (Intern)	Date Signed

Approved By: B. H. Faulkenberry 1/18/79  
B. H. Faulkenberry, Chief, Reactor Project  
Section 2, Reactor Operations and Nuclear  
Support Branch Date Signed

Summary: Section 2, Reactor Operations and Nuclear Support Branch

Inspection on December 26-29, 1978 (Report No. 50-206/78-15)  
Areas Inspected: Routine, unannounced inspection of Q.A. surveillance; review of plant operations; startup testing following outage; welding; NDE; LER followup; noncompliance followup; inspector identified item followup; and independent inspection effort. The inspection involved 106 inspector-hours by four NRC inspectors.

Results: No items of noncompliance or deviations were identified.

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## DETAILS

### 1. Persons Contacted

- \*R. Brunet, Plant Superintendent, Unit 1
- \*H. Ray, Manager, Quality Assurance
- \*B. Curtis, Supervising Engineer
- \*P. Penseyres, Nuclear Engineer
- \*J. Dunn, SONGS 1 Plant Q.A. Supervisor
- \*W. Malay, Quality Assurance Engineer
- \*J. Mortensen, SCE Chemical-Radiation
- \*G. Beetz, Maintenance Foreman
- \*F. Ricks, Nuclear Engineer
- \*J. Sargent, Supervisor, Plant Instrumentation
- H. Key, Chemical-Radiation Protection Foreman (acting)
- D. Shepard, SCE Metallurgist
- W. Gould, SCE Engineer
- T. Timmons, Q.A. Engineer

The inspectors also interviewed several other licensee employees including members of the engineering staff, watch engineers, operating foreman, and maintenance personnel.

\*Denotes those at exit interview.

### 2. Q.A. Program Annual Review

The changes to the licensee's Q.A. program that were made during 1978 were reviewed for conformance with the program description as contained in the licensee's application, as amended. During this review, discussions were held with the personnel responsible for implementing the changes.

Procedures for implementing the Q.A. program change dated September 19, 1978, which addressed the 10 CFR 21 requirements, were verified to be developed and implemented. (See IE Report No. 50-206/77-19, Paragraph 4.)

The inspectors noted that the Q.A. Manual and Q.A. Program Topical Report require the plant engineer to review and evaluate safety-related test results. The operations organization had not been aware of this procedural requirement and a Q.A. department Corrective Action Request (CAR) No. P-120 was issued on this subject as a result of Q.A. Audit S01-22-78.

The operating staff's response to the CAR was to recommend a change to the Q.A. Manual and Topical Report which would require these reviews and evaluations to be in accordance with current standard operating practices at San Onofre, and in accordance with that which is specified in ANSI-N18.7-1976 and NUREG 75/087. This manual change is underway and will be completed in January 1979.

The method for communication of program and procedure changes between the operations and Q.A. organizations was not defined. A licensee representative committed to correcting this problem. (See exit interview - Paragraph 12)(OI 78-15-01)

### 3. Records

The inspector verified by examination of the following records that the program for the control, storage, retention, and retrieval of records and documents was in conformance with the technical specifications.

- a. Axial Offset Calibration Data for the Last Refueling Outage
- b. Incore Flux Map S1C6F043(8-78)
- c. T-Average Recorder Chart for August 1978
- d. 1977 Containment Integrated Leak Rate Test Report
- e. Control Rod Exercising Sheets for January 1974
- f. Maintenance Records on the Installation of Control Room Containment Pressure Instruments PIS 511, 512, 513
- g. S-3-3.12
- h. P & ID 568782-18
- i. P & ID 568767-19
- j. S-I-1.13, Revision 3
- k. Electrolyte Level Sheets for Pilot Cells or 125 V Battery for June 1975.

The inspector found some improvement, over the 1977 review, in the area of transferring quality-related records to the Document Control Center. Also, a concern documented in IE Report 50-206/77-14, Paragraph 5, with respect to storage of recorder charts, has been alleviated. The T-average recorder chart examined at this time was appropriately labeled and filed. Cross-referencing between component name or surveillance test name and record location is still

inadequate to produce some of the requested records in less than several hours. Timely records retrieval is highly dependent on using people that are knowledgeable of the system terminology. This item and the referenced IE report were discussed at the exit meeting and both are considered closed.

The records of various parameters of reactor operations, including core thermocouples and incore flux measurements, were examined to ensure that licensee personnel could detect long-term equipment degradation or adverse trends. Also, up-to-date copies of plant drawings on two modified systems were verified to exist.

No items of noncompliance or deviations were identified.

4. Training

The inspector examined training and retraining programs required for persons working at the licensee's facility. These programs consisted of both formal training as well as on-the-job training provided by the responsible group supervisors. The formal training included:

- a. Industrial Safety
- b. Radiological Health and Safety
- c. Fire Protection and Firefighting
- d. Emergency Plan
- e. Security
- f. Quality Assurance

The inspector verified through an examination of employee training records for the past year and discussions with licensee representatives, that employees have been provided formal training in these areas on an annual basis and that appropriate records of on-the-job training were being maintained. In addition, female employees were provided with instruction concerning prenatal radiation exposures.

No items of noncompliance or deviations were identified.

5. Calibration

The calibration requirements and procedures for the following measurements were discussed with licensee representatives and examined separately.

- a. Boric Acid Concentration
- b. Condensate Storage Tank Level
- c. Containment Sphere Pressure
- d. Diesel Generator Day Tank Level
- e. Demineralized Water Integrated Flow
- f. Boric Acid Integrated Flow
- g. Battery Voltage
- h. Battery Gravity
- i. Reactor Coolant Specific Activity
- j. Boric Acid Tank Level

Procedures used to perform these calibrations were found to have been reviewed and approved and to contain acceptance values and detailed instructions for calibration. Based on discussions with licensee representatives, the technical content of the procedures for performing calibration for Items a, h, and i were examined.

The calibration records for the measurements identified above were examined for the calibrations done in the most recent refueling shutdown. The traceability to certified equipment of the accuracy of the calibrating devices used by the licensee was verified in these cases.

No items of noncompliance or deviations were identified.

#### 6. Surveillance

The licensee's procedures for performing, documenting and reviewing surveillance tests required by the technical specifications were reviewed. Specifically, the following procedures were examined:

- a. Control Rod Exercising and Boric Acid Flow Path Verification (S-3-3.12)
- b. Reactor Plant Instrumentation Testing (S-II-1.1)
  - (1) Reactor Coolant Temperatures
  - (2) Steam Generator Level Test and Flow Mismatch

- c. Auxiliary Feedwater Pump Operation and Testing (S-2-13)
- d. Containment Sphere Pressure Test (S-II-1.1)
- e. Battery Maintenance, Weekly Tests, (S-I-1.18)

Surveillance tests a and c above were witnessed by the inspector and discussed with the licensee. In addition, a sample of several recent test results for each of the six tests was examined.

No items of noncompliance or deviations were identified.

7. Review of Plant Operations

a. Shift Logs and Operating Records

Representative samples of logs and records for October and November 1978 were examined and discussed with licensee personnel.

b. Tour of Facility

A tour of the facility was conducted during which the following conditions were observed:

- (1) Monitoring of instrumentation was found to be in accordance with licensee requirements.
- (2) Radiation controls were properly established.
- (3) No significant fluid or steam leaks were observed.
- (4) No abnormal pipe vibrations were observed.
- (5) The control room was manned in accordance with the requirements of 10 CFR 50.54(k) and the facility technical specifications. The control operator appeared knowledgeable as to the reasons for actuation annunciators.
- (6) Housekeeping appeared adequate. No fire hazards were observed. A drip bucket which was used to collect fluid leaks from a potentially radioactive source had a hole in the bottom of it, but the area beneath the bucket was an established epoxied clean-up area. A licensee representative stated that the problem will be remedied.

c. Post Refueling Review

A review of facility records confirmed that systems disturbed during the refueling outage were returned to service in accordance with approved procedures. Signatures on the critical rod position calculation form prior to startup indicated proper authorization for rod withdrawal; the calculation correlated to the actual rod position upon achieving criticality. Required surveillance tests were performed in accordance with the facility technical specifications.

No items of noncompliance or deviations were identified.

8. Startup Testing/Refueling

The shutdown and startup packages for the past refueling outage were examined to verify that core physics testing was performed in accordance with technical specification requirements. Procedures covering the following areas were examined for technical adequacy and procedural requirements:

- a. Core Thermal Power
- b. Reactor Shutdown Margin
- c. Isothermal Temperature Coefficient
- d. Control Rod Worth
- e. Axial Offset

Results of the testing in the above areas were found to correlate with previous results and the Reload Safety Evaluation. No reactivity anomalies were disclosed in the course of the testing that would indicate a significant difference from predicted results.

No items of noncompliance or deviations were identified.

9. Licensee Event Followup

The circumstances and corrective actions described in Licensee Event Reports (LER) submitted since the previous inspection were verified. The report of each event had been submitted to the NRC Regional Office within the required time interval. The LER's examined and comments on this examination by the inspector follows:

- a. (Open) LER 78-11 - Failure of Safety-Related Snubbers: The LER states that the degraded condition of the snubbers, which consisted of damaged threads on the piston rod and rod lock nut resulting in partial disengagement of the piston from the piston rod, was caused by operating transients, including water hammer, which occurred early in plant life.

At the exit meeting, a licensee representative stated that the degradation of the snubbers may not have resulted from the above described cause. The licensee stated that they currently are not sure what caused the degradation; however, in conjunction with the ITT Grinnel Corporation, they are actively investigating the problem.

In accordance with telephone conversations held on November 30, 1978, the licensee at the exit meeting stated that during the next cold shutdown period they will disassemble for internal examination at least 22 snubbers including the nine that were identified in LER 78-11 (OI 78-15-02).

Any future recommended snubber design changes, descriptions of failure mechanisms, and additional testing requirements will depend upon the results of the current evaluation being performed by ITT Grinnel and the results of the internal inspections performed during cold shutdown.

- b. (Open) LER 78-12 - Class 2 Pipe Cracks: In correspondence to the NRC Regional Office dated November 21, 1978, the licensee reported cracks in portions of the reactor coolant pump seal water return line and an elbow fitting in the charging pump discharge line. The cracks were discovered during inservice inspection pressure tests on class 2 components while the unit was in the cold shutdown condition. The licensee attributed the cracks to chloride induced stress corrosion.

Limits for the safe operation of the facility as prescribed in the technical specification were not exceeded for the event. The report had been submitted to the NRC Regional Office within the required time interval.

The circumstances surrounding the event were examined. The inspector visually examined the location of the failures, the failed seal water return piping, test samples taken from the scheduled 10 seal water return piping, and the cracked schedule 160 charging pump discharge elbow. The licensee's metallographic analysis of the schedule 10 stainless steel piping indicates that the failure mechanism is transgranular stress



corrosion cracking originating from the outside surface of the pipe and induced by the chloride-rich environment of gravel which surrounded the piping. The quantitative analysis of the chloride environment was not available for the inspector's review. The licensee had not performed a metallographic analysis on the schedule 160 elbow crack because the crack could not be found by liquid penetrant testing after the elbow was removed. The licensee agreed to further testing of the schedule 160 charging pump discharge elbow to the extent necessary to confirm the failure mechanism.

The corrective action described in the LER was examined. The inspector visually examined the replacement piping and conditions in the pipe trench. The chloride retaining gravel has been removed from the trench and the covers will be replaced to protect the piping from the salt air. The trench is equipped with a drain into an adjacent tunnel. The licensee believes that these corrective actions are appropriate and that the environment in the trench will duplicate the environment in an adjacent pipe tunnel in which there have been no pipe crack problems. The licensee is replacing all carbon steel pipe supports in the trench with stainless steel. The inspector noted some apparent asbestos insulation on nonsafety-related sample lines and questioned the possibility of chloride leaching. The licensee agreed to evaluate the effect of any such insulation on all safety-related stainless steel lines in the trench.

At the request of the inspector, the licensee reviewed the other lines in the trench and identified two other safety-related stainless steel lines. The licensee will perform liquid penetrant examinations on these lines for detection of cracks. The licensee stated that there is no other stainless steel piping located in the same high chloride environment. The licensee is now reviewing and evaluating the function of all schedule 10 stainless steel piping located in the plant.

The inspector reviewed procedures and quality records associated with the installation and testing of the replacement piping.

This matter is considered to be an open item pending the satisfactory review of the following items during a subsequent inspection; (1) chloride analysis report for environment surrounding area of pipe cracks (OI 78-15-03), (2) results of failure analysis review of the schedule 160 charging pump discharge line elbow (OI 78-15-04), (3) licensee's evaluation of chloride leaching potential of asbestos insulation located in the pipe trench (OI 78-15-05), (4) results of surface

examinations of safety-related pipes located in the pipe trench (OI 78-15-06), and (5) results of licensee's review and evaluation of usage of schedule 10 stainless steel safety-related piping in the plant (OI 78-15-07).

10. Licensee Action on Previous Inspection Findings

The circumstances and corrective action described in the licensee's responses to the items of noncompliance listed below were verified. The corrective measures taken to avoid further items of noncompliance were effected within the committed time periods described in the replies.

- a. (Closed) Noncompliance (50-206/77-11): Procurement documents for the purchase of repair parts for the boric acid transfer pumps were not reviewed by the Q.A. organization. The repair parts were not identified as safety related such that a subsequent Q.A. procurement document review was not tendered. The inspector verified that the corrective actions described in the licensee's correspondence of September 9, 1977 were completed as stated.
- b. (Closed) Deviation (50-206/78-09): A fire barrier installed between two cable trays in the 480V switchgear room was partially removed to facilitate pulling of new security system cabling. The inspector examined various memoranda and procedures to verify that the corrective actions described in the licensee's correspondence of September 6, 1978 were complete as stated.
- c. (Closed) Followup items (50-206/77-14): The inspector identified problems with respect to records management. A licensee representative committed at the exit interview in the referenced report to investigate methods to expedite the transfer of quality related records to the Document Control Center and to improve the retrievability of records by improving the indexing and/or cross-referencing of records and their location.

Some improvement has been noticed in this area. (See Paragraph 3.) The licensee relies on adequately trained and knowledgeable personnel for proper operation of their records management system.

The licensee is sensitive to proper operation of their system and is changing the system continually.

11. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the inspection are discussed in Paragraph 9.

12. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on December 29, 1978. The inspectors summarized the purpose and the scope of the inspection and the findings.

A licensee representative stated that measures will be in effect by the end of January, 1979 for a system of communicating and implementing changes to programs and procedures between the operations and the Q.A. organizations. (See Paragraph 2.) (OI 78-15-01)

A licensee representative stated that during the next cold shutdown, an inspection program on safety-related snubbers will be performed. This program will entail an internal inspection for damage similar to the problem reported in LER 78-11 of at least 22 snubbers (including nine snubbers which were repaired during the last refueling outage). The licensee will inform Region V of the results of the internal inspection prior to startup following the cold shutdown. (See Paragraph 9.a) (OI 78-15-02)

Licensee representatives stated that they will follow up on the unresolved items listed in Paragraph 9.b. One representative stated that a metallurgical examination of an elbow in the charging pump discharge line which was reported as leaking in LER 78-12 will be performed. This should be completed by the end of January, 1979. (OI 78-15-03 to 07)