

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

REGION V

Report No. 50-361/81-03

Docket No. 50-361 License No. CPPR-97 Safeguards Group _____

Licensee: Southern California Edison Company

2244 Walnut Grove Avenue

Rosemead, California 91770

Facility Name: San Onofre Unit 2

Inspection at: San Diego County, California

Inspection conducted: January 16 to February 13, 1981

Inspectors: Gerald B. Zwetzig for 4/9/81
R. J. Pate, Senior Resident Inspector Date Signed

A. Johnson 4/9/81
A. Johnson, Reactor Inspector Date Signed

Gerald B. Zwetzig for 4/9/81
L. Miller, Resident Inspector Date Signed

Approved By: Gerald B. Zwetzig 4/9/81
G. Zwetzig, Acting Chief, Reactor Projects Section 2, Date Signed
Reactor Operations Projects Branch

Summary: Inspection on January 16 to February 13, 1981 (Report No. 50-361/81-03)

Areas Inspected: Routine, unannounced inspection of licensee's preoperational test program and procedures, observation of test, and independent inspection effort. The inspection involved 130 inspector-hours on-site by three NRC inspectors.

Results: Of the six areas inspected, one item of noncompliance was identified (see Paragraph 6).

DETAILS

1. Persons Contacted

a. Southern California Edison Company (SCE)

- +V. B. Fisher, Supervisor Plant Operations
- @D. Hoffman, Project Construction Engineer
- @D. Lokker, Operations Supervisor
- +J. J. Wambold, Acting Project Manager
- +A. Sistos, Engineer
- +T. D. Garvin, Quality Assurance Engineer
- +@*K. A. Slagel, Startup Management Supervisor
- H. E. Morgan, Unit 2 Station Superintendent
- +@*P. R. Belhumeur, Startup Quality Supervisor
- @G. A. Chaves, Project Startup Supervisor
- K. E. O'Connor, NSSS Test Operations Supervisor
- +@*P. A. Croy, Site Project Quality Assurance Supervisor
- D. E. Nunn, Quality Assurance Manager
- *R. M. Rosenblum, Startup Engineering Supervisor
- J. Willis, Manager, Nuclear Training
- D. Stonecipher, Operations Quality Assurance Supervisor
- C. R. Horton, Startup Quality Assurance Engineer
- W. McGhee, Operations Training Administrator
- +@*T. O. Gray, Quality Assurance Engineer

b. Bechtel Corporation

- @K. E. Hess, Startup Project Engineering Supervisor
- +@*D. W. Strolman, Startup Quality Assurance Supervisor

In addition, construction and maintenance craftsmen, engineers and foremen were contacted during the inspection.

- *Denotes attendees at Management Meeting on January 29, 1981.
- +Denotes attendees at Management Meeting on February 5, 1981.
- @Denotes attendees at Management Meeting on February 12, 1981.

2. Plant Status

The licensee reported Unit 2 construction to be 98 percent complete as of February 11, 1981.

3. Licensee Action on Previous Inspection Finding

The inspector examined the action taken by the licensee on a previous inspector-identified concern as follows:

(Closed) Follow-up Item (50-361/80-16/05): SCE was requested to respond to four areas of concern resulting from the Low Pressure Safety Injection system valve operator failure during the primary system hydrostatic test. Three of the concerns previously were closed in report 50-361/80-22.

Regarding the remaining concern, the inspector requested SCE to provide a determination of the cause of the valve operator failure. SCE provided a report titled "Failure Report for the Model 74 R-0088 Glove Valve Assembly" written by the Target Rock Corporation and dated January 7, 1981. The report stated that the operator drive sleeve was found fractured when the valve operator was disassembled. The drive sleeve was designed to withstand a maximum load of 112,000 lbs. Target Rock Corporation estimates it took a minimum of 125,000 lbs. to break the drive sleeve. A handwheel force of about 125 ft-lb should be required to operate the valve with a hydrostatic load of 3080 psi (the valve operator failed during the reactor coolant system hydrostatic test at 3080 psi). To apply a force of 125,000 lbs. on the drive sleeve a handwheel torque of 220 ft-lb. would have been required. Since the inspector had previously determined that the valve had been manually tightened with an extension lever applied to the handwheel (see Report 50-361/80-16), it is assumed that this action caused or contributed to the failure of the valve operator. The SCE Plant Operations organization has already issued an instruction to the plant operators to prohibit use of extension levers on power-operated valves and limited the use of extension levers on manual valves. (See Report 50-361/80-17). In addition, SCE Engineering is evaluating the additional actions recommended in the Target Rock report and by SCE QA. The inspector has no additional question, but will review the results of the SCE Engineering evaluation. (50-361/81-03/01)

4. Separation of Pressurizer Instrumentation

In a discussion with a SCE QA Engineer, the inspector determined that SCE had identified a connection between instrument piping designated as safety related and non-safety related. The level transmitter 2 LT-0103 which provides a level signal for the pressurizer, but has no inputs to the Reactor Protection System (RPS), is connected to the sensing lines used for channel 2 and channel 4 level and pressure signals to the RPS. The Senior Resident Inspector met with representatives of Bechtel Engineering and SCE Engineering Organization. As a result of this meeting the inspector determined the following:

- a. The lines designated non-safety related which provide inputs to 2 LT-0103 were installed in accordance with the Bechtel QA program.
- b. The lines used for inputs to 2 LT-0103 will be separated by distance or barriers to meet the separation criteria.
- c. 2 LT-0103 was purchased without seismic qualification requirements. Bechtel will request seismic qualification certification or test data from the vendor. If the transmitter can not meet the necessary qualification criteria for maintaining the RCS pressure boundary, the instrument will be replaced.
- d. There are also four other similar instruments (two per steam generator) on the Unit 2 steam generators. Comments a, b, and c, above, also apply to these four instruments.

The inspector stated that it appeared that a single failure on 2 LT-0103 would cause a RPS trip and, therefore, should be acceptable. However, this item would be subject to additional NRC review. The inspector stated that, if additional questions resulted from the NRC review, these questions would be provided to SCE.

5. Preoperational Test Procedure Review

The inspectors examined the following test procedures to ascertain conformance with FSAR commitments and regulatory requirements.

- a. Precore Hot Functional Test-2 HA-210-01, Rev. 0
- b. Emergency Safety Features Actuation System (ESFAS) Test-2PE-355-02, Rev. 0
- c. Plant Protection System Response Time Test-2PE-358-01
- d. Thermal Expansion - 2HA-102-01, Rev. 0
- e. Auxiliary Feedwater System - 2PE-235-01
- f. Control Element Drive Mechanism (CEDM) - 2HA-315-01
- g. Instrument Correlation - 2HA-317-01

The inspector verified that the test acceptance criteria incorporated the requirements of the FSAR and Regulatory Guide 1.68, Rev. 0.

Regarding the Thermal Expansion Test, the inspector noted that this test excluded all systems that were designed to operate below 200°F.

The licensee Engineering representatives stated that it was their position that:

- a. The preoperational test on these systems could be at ambient due to the small amount of movement expected (maximum of approximately 3/16 inch deflections).
- b. There is no need to walk down the systems to verify that there is adequate clearance because this was done prior to system turnover from construction to Startup.

The inspector stated clearance verification appeared to be necessary as even relatively small movements could cause large stresses, if restrained. The records of the walk-downs that verified that the piping systems have adequate clearances will be reviewed in a future inspection. (50-361/81-03/02)

No items of noncompliance or deviations were identified.

6. Preoperational Test Procedure Observation.

The inspectors witnessed selected portions of each of the following test procedures.

- a. Auxiliary Feedwater System - 2PE-235-01
- b. Control Element Drive Mechanism(CEDM) - 2HA-315-01
- c. Instrument Correlation - 2HA-317-01
- d. Engineered Safety Features Actuation - 2PE-356-01, Rev. 0.
- c. Thermal Expansion - 2HA-102-01, Rev. 0.

For each of the above procedures the inspectors observed that the personnel conducting the tests were using the latest revision of the test procedure and that the procedure was being followed. Also, the inspectors verified that the required data were collected and that the taking of the data was properly coordinated.

The inspectors had comments on some of the tests witnessed. These are listed by test title.

Instrument Correlation.

The inspector noted that the licensee had identified several reactor coolant system instruments that were not calibrated prior to commencing the test and had elected to proceed with the test. In addition, the inspector observed that many of the instruments checked by this test did not meet the vendor's specified tolerances. The inspector stated that the licensee's corrective action to resolve these nonconformances with the specification would be reviewed at a subsequent inspection. (50-361/81-03/03)

Thermal Expansion.

The inspector observed selected piping and equipment supports and seismic restraints during the ambient and 260^oF plateaus. The startup engineers taking the ambient (about 70^oF) temperature data for the pipe supports and seismic restraints could not reconcile the numbers of the installed equipment and the data required on the data sheet of Appendix AA of the procedure (2HA-102-01, Rev. 0). The inspector expressed concern about this apparent inconsistency to the startup engineer taking the data and the QA engineer witnessing the measurements. The inspector was advised that all pipe supports and seismic restraints would be measured and thereby no required data would be missed. Subsequently, the inspector cross-checked the supports and restraints listed in Appendix AA against the referenced drawings. The inspector identified ten supports or restraints that were listed in Appendix AA that were not listed in the reference drawings. By the time these omissions were identified and the management personnel of the Startup and QA organizations were advised of the finding, SCE had allowed the startup test to progress to the 260^oF plateau and the thermal expansion measurements had been taken. As a result of the discussion between the licensee personnel and the inspector, the licensee's startup management personnel committed to the following:

- a. Put a "hold" on the thermal expansion test at 260°F.
- b. Review the test procedure to eliminate any errors.
- c. Add a stress engineer to each team taking thermal expansion data.
- d. Repeat the 260°F plateau measurements using the corrected procedure.

Based on their review SCE determined that the measurements for approximately 30 supports or restraints had not been taken at ambient temperature conditions as required. SCE management personnel stated that these readings would be taken when the system is returned to ambient after the Hot Functional Test. Also, as a result of the review of the procedure, a revised Appendix 10 S was substituted for Appendices 10 K, 10 M, 10 O, 10 Q, 10 U and 10 W. The inspector compared the revised Appendix 10 S with the first 13 pages of the previously approved Appendix 10 K. Twenty of the 101 supports and restraints listed in these 13 pages were changed in Appendix 10 S. In addition, 72 of the calculated deflections at design temperature were changed. The inspector asked SCE and Bechtel personnel whether the approved copies of the test procedure 2HA-102-01, Rev. 0, and Appendices 10 K and AA used to take the ambient temperature deflection measurements, had received a detailed review to verify that they were in accordance with the latest design drawings. Both SCE and Bechtel personnel responsible for this review stated that the detailed review had not been done. Cognizant Startup Engineer review of the procedure to verify conformance to the latest drawings is required by Startup Test Instruction TI No. 2, Paragraph 5.2.3. Review of the procedure by the writing organization approximately 90 days prior to scheduled test date is required by TI No. 2, Paragraph 5.2.2. These failures to follow Startup Test Instruction TI No. 2 is an item of noncompliance.
(50-361/81-03/04)

7. Preoperational Test Results

The inspector examined the documentation for the following preoperational tests. The documentation included the necessary Test Change Notices and Test Exception Reports.

- a. Condensate Storage and Transfer System Test - 2PE-260-01, Rev. 0
- b. Reactor Regulating System Test - 2AC-356-01
- c. Emergency Safety Features Actuation Test Module 2UI-K058-2059 and Auxiliary Relay Cabinets 2L-35 and 2L-34 Component Tests
- d. High Pressure Injection Sys. - 2PE-225-01
- e. Low Pressure Injection Sys. - 2PE-225-02
- f. Safety Injection Tanks - 2PE-225-03
- g. Containment Spray Sys. - 3PE-226-01

The records for the tests listed as a, b, c, and f, above were complete. The tests listed as d, e, and g were not complete. Certain portions of these tests require retest as identified in the test results. The results of these tests had not been submitted to the Test Working Group for final acceptance and approval.

No items of noncompliance or deviations were identified.

8. Onsite Safety Committee Activities

The inspector examined the activities of the Onsite Safety Review Committee. The Committee's charter, membership, and authorities were discussed with the responsible licensee representatives. At the current time, the only responsibility authorized and being discharged by the Committee was review and approval of procedures being implemented under the jurisdiction of the Nuclear Plant Operations Manager. The committee and its activities were found to be consistent with the nuclear plant status and with the proposed Technical Specifications.

9. One Inch Diameter Hilti Kwik-Bolt

In response to a Regional request, the inspector followed up on the use of 1-inch diameter Hilti Kwik-Bolts at San Onofre Unit-2. Hilti Corporation made a Part 21 report that tests on the 1-inch diameter Kwik-Bolts did not agree with previous test strengths of the bolts. Previous test results provided by Hilti indicated the bolts had an average ultimate tensile value of 27,500 lbs. The new test data indicate the average ultimate tensile value to be 23,441 lbs. Review of the Bechtel Construction Specification CS-C8 revealed that the maximum load on 1-inch diameter Kwik-Bolts at San Onofre is 4,000 lbs. This satisfies the requirements of IE Bulletin 79-02 to have a safety factor of 4, since 4 times 4,000 lbs. (16,000 lbs.) is less than the 23,441 lbs. allowed by the test results.

No items of noncompliance or deviations were identified.

10. Plant Tour

The inspector toured Unit 2 several times during the report period. Particular attention was directed to observing housekeeping, equipment preservation, maintenance activities and work on completed systems.

The inspector observed that the steam generator upper seismic restraints are hydraulic snubbers. Some of the materials used in these snubbers were observed to be rubber and plastic. The Installation-Operation-Maintenance Manual provided by the vendor, Paul-Munroe Hydraulics, Inc., states that the, "...blind head, rod head, piston and rod seals are TEFZEL 280, which is a high temperature, chemically inert, radiation resistant thermoplastic. It is rated for continuous duty at 225°F and short intermittent duty at 300°F." Also, the connecting hose to the reservoir is rated for..."continuous service at temperatures from 40°F to 200°F and intermittent service of 250°F." The FSAR Section 5.4.14.2.2 states that the function of the snubbers is to provide support during seismic events and following a LOCA or a steam line break. It appears, from the FSAR statement that the hydraulic snubber must operate after the LOCA or steam line break. The limiting

temperatures for some of the materials listed in the vendor manual, appear to be inconsistent with the post-LOCA environment. The inspector requested the environmental qualification data (calculations or test results). SCE management personnel said that the data would be provided. (50-361/81-03/05) This is an unresolved item.

No items of noncompliance or deviation were identified.

11. Management Interview

On January 29, February 5, and February 12, 1981, the inspectors met with the licensee representatives, identified in Paragraph 1, to discuss the scope and findings of the inspection. The licensee made commitments described in Paragraphs 6 and 9.