

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-362/82-24

Docket No. 50-362 License No. CPPR-98 Safeguards Group \_\_\_\_\_

Licensee: Southern California Edison (SCE) Company  
P. O. Box 800  
2244 Walnut Grove Avenue  
Rosemead, California 91770

Facility Name: San Onofre Unit 3

Inspection at: San Onofre, California

Inspection conducted: October 12-29, 1982

Inspectors: *D. F. Kirsch* 11/17/82  
J. P. Stewart, Reactor Inspector Date Signed

*D. F. Kirsch* 11/17/82  
D. F. Kirsch, Chief, Reactor Projects Section No. 3 Date Signed  
Reactor Projects Branch No. 2

Approved by: *D. F. Kirsch* 11/17/82  
D. F. Kirsch, Chief, Reactor Projects Section No. 3 Date Signed  
Reactor Projects Branch No. 2

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Date Signed

Summary:

Inspection on October 12-29, 1982 (Report No. 50-362/82-24)

Areas Inspected: Routine, unannounced inspection of the Unit 3 Preoperational Test Program including the following areas: Comparison of as-built plant to FSAR description; Test procedure verification; Evaluation of test results, Verification that tests are evaluated by licensee; Testing of pipe support and restraint systems; Non-routine event followup; and independent inspection. The inspection activities involved 89 inspection hours by two regional based inspectors.

Results: Of the seven areas examined, no items of noncompliance or deviations were identified.

## DETAILS

### 1. Persons Contacted

- +H. Ray, Station Manager
- +W. McRory, Unit 2/3 Operator Training Administrator
- +\*D. Schone, Project Quality Assurance Supervisor
- +P. King, Unit 2/3 Operations Quality Assurance Supervisor
- +W. Lazear, Startup Quality Assurance Engineer
- +\*C. Horton, Startup Quality Assurance Supervisor
- \*G. Patterson, Startup Quality Assurance Engineer
- \*J. Huey, Startup Engineer
- B. Absher, Startup Quality Assurance Engineer
- G. Whetton, Startup Quality Assurance Engineer
- W. Faust, Training Records Administrator
- G. Rosenbloom, Startup Engineer

+Denotes those attending exit interview on October 15, 1982. Also present at the October 15, 1982 exit interview was A. Chaffee, Senior Resident Inspector.

\*Denotes those attending exit interview on October 29, 1982.

The inspector also interviewed and talked with other Licensee employees during the course of the inspection. These included control room operators, station and contractor startup engineers and quality assurance personnel.

### 2. Comparison of As-Built Plant with FSAR Description (Closed)

The inspector examined, the exceptions noted during a previous inspection (82-17) and determined by visual observation that: (1) The High Pressure Safety Injection (HPSI) pump No. 1 (P017) minimum flow discharge piping/orifice to the refueling water storage tanks was reinstalled and the temporary carbon steel piping had been removed; (2) The modifications to the Shutdown Cooling System and the Low Pressure Safety Injection system described in Design Change Packages (DCP) 41-N, 44-N and 52-N were essentially completed; (3) The installation of the indicators and controllers for the shutdown cooling system valves on control room panels No. CR57 and CR58 was completed; (4) The suction piping relief valves on HPSI No. 1 and No. 3 were installed. This item (82-17-02) is closed.

No items of noncompliance or deviations were identified.

### 3. Operating Staff Training (Closed)

The inspector reviewed the status of the licensee's commitment to revise training memorandum (TM) 4-80, "San Onofre Nuclear Generating Station Training Record Maintenance". The licensee extended the date of completion and indicated that a formal training division procedure would be written to maintain individual training records

and that TM 4-80 would be eliminated. The licensee committed to have the new procedure completed by January 1, 1983. This item (82-17-03) remains open.

The resident inspector attended and reviewed the training lectures as noted in Inspection Report 50-362/82-26 and based on this review this item is closed.

No items of noncompliance or deviations were identified.

4. Preoperational Test Procedure Verification (Closed)

The inspector examined the following preoperational test procedures:

3AC-110-11, "Spent Fuel Machine and New Fuel Elevator"  
3AC-110-12, "New Fuel Crane"  
3AC-110-13, "Refueling Machine and Transfer System"  
3PE-232-01, "Salt Water Cooling"  
3PE-232-02, "Salt Water Cooling with Pumps"  
3PE-250-01, "RCS Cold Hydrostatic"  
3PE-250-02, "Secondary Hydrostatic"

Based on review of the above procedures and the procedures reviewed in items 5, and 6 of this inspection report, the inspector determined that the licensee's preoperational test program addresses NRC requirements outlined in Regulatory Guide 1.68 and licensee commitments in the San Onofre Units 2 and 3 FSAR, and that the licensee has a written test procedure, which has been reviewed and approved for each of the required systems.

No items of noncompliance or deviations were identified.

5. Preoperational Test Results Evaluation (Open)

The inspector examined the following completed preoperational test results:

3AC-285-01, "Compressed Air System Test"  
3HA-212-07, "Boration and Dilution Measurements Test"  
3HA-220-01, "Chemical and Volume Control System Integrated Test"  
3PE-109-01, "Reactor Component Handling System Test"  
3PE-223-01, "Reactor Coolant Letdown Sub-System Test"  
3PE-223-02, "Reactor Coolant Purification Sub-System Test"  
3PE-223-04, "Volume Control Tank Test"  
3PE-230-01, "Component Cooling Water Test"  
3PE-313-02, "Pressurizer Safety Valve Test"  
3PE-425-01, "4.16KV Switchgear Energize and Interlock Test (1E)"  
3PE-425-02, "4.16KV Switchgear (1E) LOV Relays Test"  
3PE-435-01, "480V AC Switchgear Energize Interlock Test (1E)"  
3PE-451-01, "Vital Bus System Operational Load Test"  
3PE-472-01, "Diesel Generator Electrical and Auto Starts Test"  
3PE-472-03, "Diesel Generator Load Sequencing Test"  
3PE-475-01, "Vital AC and DC Safety Channel Independence Test"

Based on the review of the above completed preoperational test results the inspector determined the following:

- . Test results are adequately evaluated by the licensee.
- . Test data meets the FSAR acceptance criteria with minor deviations and that the deviations are properly identified and resolved by the test working group.
- . The test working group is properly following the administrative review procedures in the review of the test results.
- . Administrative procedures appeared to be adequately followed in the execution of the individual tests.

The inspector noted that during the review of the results of 3PE-313-02, "Pressurizer Safety Valve Test", that one of the two Dresser safety valves, 3PV-0201, had failed open during the Lift Test and that the valve had been subsequently removed and replaced. The test exception report (TER), TER-02, required that the testing of the replacement safety valve be performed during Post-Core hot functional testing and that the failed valve be sent to Dresser for failure analysis. The inspector also noted that the failed safety valve still remained on site after two months. The licensee agreed to look into this matter and provide the results of the failure analysis of the failed safety valve when available. This matter will be examined on a subsequent inspection (82-24-01).

The inspector noted that during the review of 3PE-230-01, "Component Cooling Water Test", that in TER-16 and TER-17 the various components, did not have which are cooled by the Component Cooling Water, the minimum required flow during Train A and Train B cooldown mode tests. The action taken by the test working group in TER-16 and TER-17 was to change the FSAR to reflect the actual measured flow rates. The inspector questioned the licensee as to what action was taken during similar tests on Unit 2. The licensee agreed to look into this matter. This matter will be examined on a subsequent inspection (82-24-02).

The inspector identified a concern during the review of 3PE-472-03, "Diesel Generator Load Sequencing Test" and 3PE-425-02, "4.16KV Switchgear (IE) LOV Relays Test." The preoperational test procedures did not verify that, 4 seconds after the loss of voltage (LOV) signal, the LOV relays shed all loads, except load centers as required by the FSAR 8.3.1.1.4.6.c. The licensee indicated, however, that the 4 second criteria for shedding all loads except load centers was verified during the performance of surveillance procedure S023-3-3.12, which tests Engineered Safety Feature load sequencing and testing. The inspector verified that Step 2.2.5 of the procedure

verified the four second requirement was met by visually reviewing the strip recording charts obtained during the performance of surveillance procedure S023-3-3.12. The licensee stated that the applicable preoperational test procedure would be amended to reference the performance of the LOV relays in meeting the 4 second load shedding criteria. The licensee's preoperational test program is not completed at this time and the test results will be reviewed during a subsequent inspection (82-17-01).

6. Testing of Pipe Support and Restraint Systems

a. Review of Program, Procedures and Data

The inspector examined the following documents to ascertain the degree of compliance with commitments made in the FSAR, Paragraphs 14.2.12.72 and the license's answer to question No. 112.5

- . Program Plan for Piping Verification Program (Thermal expansion, Steady State Vibration, and Dynamic Effects), Revision 6, dated February 20, 1981
- . Procedure 3HA-102-01: Thermal Expansion, included data review
- . Procedure 2PE-102-02: Steady State Vibration Test - Preoperational Test Summary, included data review
- . Procedure 3HA-102-02: Steady State Vibration Test - Hot Functional test, included data review
- . Procedure 3PE-102-03: Dynamic Effects Test - Preoperational Test Summary, included data review

The program, procedures and data appeared adequate in that:

- . Examinations were conducted of piping support systems at various temperatures from ambient to normal operating to detect interference due to thermal expansion.
- . Setting and calibration of snubbers, restraints and vibration arresters were performed and checked at predetermined temperatures.
- . Examination of pipe support and restraint systems during transient testing appeared adequate to ascertain that pipe motion and vibration are within limits and water hammer effects on pipe supports and restraints did not exist.
- . Conduct of vibration tests appeared adequate.
- . Displacement measurements at ambient and operating temperature appeared satisfactory.

b. Program and Procedure Implementation

The inspector toured the facility and examined the following supports and restraint systems, as indicated, for compliance with Bechtel construction specifications, procedures and the ASME B&PV Code, Section III, Division 1, Subsection NF.

- (1) Component Cooling Water (CCW) System in the CCW pump rooms and shutdown heat exchanger rooms.
  - . CCW Pumps Nos. P024, P025, and P026, pump and motor supports
  - . eight fixed supports
  - . three sway strut supports
  - . four spring hanger supports
- (2) Salt Water Cooling System - selected portions in the Auxiliary Building in the vicinity of CCW heat exchanger rooms
  - . three mechanical snubber installations
  - . two fixed support installations
- (3) Safety Injection (SI) system in SI pump rooms, shutdown cooling heat exchanger rooms and in containment.
  - . HPSI Pump Nos. P017, P018, and P019 - pump and motor supports.
  - . LPSI Pump Nos. P015 and P016 - pump and motor supports
  - . about 30 mechanical snubber installations
  - . twelve fixed support installations
  - . five spring can support installations
- (4) Containment spray piping in the shutdown heat exchanger rooms
  - . two fixed supports
  - . two spring can supports
  - . work in progress on one saddle/spring hanger support

The inspector identified that three sway strut supports on the discharge of the CCW pumps contained certain discrepant conditions. The licensee's program provides for inspections of these supports prior to determining system operability and the inspector considers that these discrepancies would have been identified during that inspection.

- . Supports S3-CC-145-H001 and S3-CC-146-H001: Sway strut spherical joints were not free to rotate without a large applied force because the spherical joints had been painted. The inspector considers that this paint would not have caused the supported pipe to sustain excessive forces before the painted surfaces did move. These supports had been inspected and accepted by Bechtel Quality Control and turned over to the startup organization.
- . Support S3-CC-145-H001: The bottom pin retainer clip on the vertical sway strut member was missing.
- . Support S3-CC-149-H001: The turn buckle locking nuts were not tight against the turnbuckles on two horizontal sway strut turnbuckle members.

The licensee took immediate corrective action to correct the above deficiencies. Based upon the fact that, of the large number of supports examined, these were the only discrepancies identified and due to the insignificant nature of the discrepancies, the inspector considers these isolated occurrences. Correspondingly, based on the adequacy of the licensee's corrective actions, this item is closed.

7. Non-Routine Event Review

Through discussions with licensee personnel and examination of Procedure S023-0-22.0 (Station Incident Reports), the inspector determined that responsibilities have been assigned for the prompt review and evaluation of off-normal operating events. The Station Incident Report is the primary document generated for the evaluation of all potentially reportable events. This includes the evaluation of activities, such as planned and unplanned testing and maintenance, when those activities could cause a potential violation of limiting conditions for operation. The Station Incident Report also provides a process for internal notification, evaluation and generation of a report to the NRC. The report will also be sent to Quality Assurance for followup and tracking of corrective action to assure the completion of those actions.

No items of noncompliance or deviations were identified.

8. Independent Inspection

a. Modifications to the Unit 3 Shutdown Cooling System

The inspector examined the licensee's modifications to the Shutdown Cooling/LPSI system as detailed by approved Design Change Nos. 41N, 44N and 52N. The electrical portions of the design change packages were completed, pipe welding and nondestructive examinations (NDE) were completed, and pipe support work was in progress. The inspector conducted the following examinations to ascertain compliance with Bechtel specifications, procedures, and the ASME B&PV Code.

- . Visual examination of 18 pipe or pipe to valve welds.
- . Visual examination of recently completed welding on five fixed pipe supports.
- . Reviewed preservice examination Ultrasonic test calibration data and NDE results for several pipe welds.
- . Reviewed system hydrostatic test boundaries, time and test pressure, and visual inspection results.

No items of noncompliance or deviations were identified.

b. Preoperational Testing of the Shutdown Cooling System

The inspector observed performance of portions of preoperational test 3PE-225-04, "Shutdown Cooling System", from the Unit 3 control room and at LPSI Pump P015. Based on this visual observation of the performance of the control room operator, quality assurance engineer and two startup engineers during the testing of pump P015 for pump flow and vibration data the inspector determined the following:

- . The test procedures were adequately followed.
- . The test data was accurately recorded by the Startup Engineers.
- . The Quality Assurance Engineer properly verified the test data at the QA test hold points by visual observation.

No items of noncompliance or deviations were identified.

c. Tour of Containment

During a tour of the Unit 3 containment the inspector observed a leaking temporary primary manway cover installed on steam generator No. 89. The leak rate was estimated to be about 5 gpm. The licensee was conducting LPSI system flow tests in



accordance with a preoperational test procedure and did not anticipate such a high water level in the primary system. The inspector expressed concerns regarding the potential for damage to the sliding steam generator base plate supports. The licensee stated that these supports contained oil impregnated graphite and as such should not be harmed by the water. However, the licensee agreed to evaluate the effects of the water leakage on safety related systems in the area and resolve any identified discrepancies. This item is closed.

9. Exit Interviews

The inspector met with the licensee's representatives (denoted in Paragraph 1) on October 15 and October 29, 1982. The scope and findings of the inspection were discussed and summarized.