U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-206/88-09

Docket No. 50-206

License No. DPR-13

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

Facility Name: San Onofre Nuclear Generating Station Unit 1

Inspection at: San Clemente, California

Inspection Conducted: March 14 - April 8, 1988

Inspector: Clifford A. Clark — 4/20/88
C. Clark, Reactor Inspector — Date Signed

Approved by: S. Richards — 4/21/88
S. Richards, Chief — Date Signed
Engineering Section

Inspection During the Period March 14 - April 8, 1988 (Report No. 50-206/88-09)

Areas Inspected: A routine announced inspection of Unit 1 activities relating to a containment Integrated Leak Rate Test (ILRT) and followup on open items. The ILRT inspection included review of procedures and records, interviews with personnel, witnessing portions of the ILRT, inspection of the Containment Building, associated penetrations and piping systems. During this inspection, inspection procedures 30703, 70307, 70313 and 92701 were covered.

Results: In the areas inspected, no violations of NRC requirements were identified.

DETAILS

1. Persons Contacted

   a. Licensee

   C. Couser, Lead Compliance Engineer
   M. Zenker, Compliance Engineer
   *D. Irvine, Station Technical Supervisor
   S. Gosselin, Station Technical Supervisor
   *P. Blakeslee, ILRT Test Director

   b. Contractor Personnel (Bechtel Power Corporation)

   *B. Patel, ILRT Engineer

   * Denotes those personnel in attendance at an exit meeting on March 21, 1988.

   The inspector also held discussions with other licensee and contractor personnel involved with the ILRT.

2. Containment Integrated Leak Rate Test (ILRT)

   a. Procedure Review

   The inspector reviewed the Unit 1 ILRT procedures as described in the licensee's Engineering Procedure SO1-V-1.3 Revision 13, TCN 13-1 of March 17, 1988 (and the Temporary Change Notices issued during this inspection) entitled, "Sphere Integrated Leakage Rate Test." This review was to ascertain compliance with plant Technical Specifications, regulatory requirements, and applicable industrial standards as stated in the following documents:

   - San Onofre Nuclear Generating Station, Unit 1, Final Safety Analysis Report (FSAR), Section 4.3, "Containment Sphere".
   - San Onofre Nuclear Generating Station, Unit No. 1, Technical Specifications, Section 4.3.1, "Containment Testing" and 3/4.6.1.2, "Containment Leakage".
   - Appendix J to 10 CFR 50, "Primary Reactor Containment Leakage Testing for Water Cooled Power Reactors."
   - American National Standard, "Leakage-Rate Testing of Containment Structures for Nuclear Reactors," ANSI N45.4-1972.
   - Topical Report BN-TOP-1, Revision 1, "Testing Criteria for Integrated Leakage Rate Testing of Primary Containment Structures for Nuclear Power Plants," Bechtel Corporation.

- American National Standard, "Containment System Leakage Testing Requirements," ANSI/ANS-56.8-1981.

- IE Information Notice No. 85-71, "Containment Integrated Leak Rate Tests."

- USNRC letter (R. Dudley to K. Baskin) to SCE, dated July 2, 1987, which provided authorization to utilize BN-TOP-1, Revision 1, 1972 for a Type A Test.

During this procedure review, the inspector identified the following observations:

The Attachment 9 "Pressurization System", in the Unit 1 ILRT procedure did not provide the same detail information found in previous ILRT procedures used for performance of ILRT's on Units 2 and 3 containments.

The last Unit 2 ILRT was performed per Engineering Procedure SO2-V-3.12, Revision 1, TCN No. 1-4, "Containment Integrated Leakage Rate Test". Attachment 3 to the Unit 2 ILRT procedure provided detail information and figures, showing system installation and hookup of support systems such as cooling water.

While this general procedure has been used to perform the Unit 1 ILRT several times, addition information on the pressurization/ depressurization system would help clarify installation of this system. During initial pressurization for this test, it was identified by the Atlas Copco air compressor operator that the cooling water supply to the after-cooler was connected to the outlet nozzle instead of the inlet nozzle. While this was not a safety concern and did not delay the test, it did initially prevent the after cooler from reducing the temperature of the air going into containment down to its expected valve of 70°F. Instead the air was entering containment at approximately 80°F.

No violations or deviations were identified.

b. Review of Records

The inspector reviewed calibration records for the instrumentation used in the ILRT. That is, the twenty-four resistance temperature detectors (RTDs), six dew point temperature sensors (dew cells), two pressure gauges used to measure containment air mass, and the flow element used to measure the induced leak during the verification portion of the ILRT. All instruments had been calibrated within the last six months with NBS traceability certificates available. The inspector also discussed the in situ check of the instrumentation with the licensee. It was noted that there was trouble with the in situ check of dew cell ME-5 (which performed acceptably later during the ILRT). Both of the original flow meters installed in the ILRT data acquisition cabinet failed during check out of equipment and therefore alternate flow measuring equipment was installed on the cabinet discharge lines for the verification flow test.

The inspector reviewed the records to assure that the following required activities were performed prior to initial pressurization:

(1) Completion of all available identified local leakage rate testing and identification of leak rates prior to and after any repairs.

(2) Removal or venting of items listed on the equipment protection and venting schedule.

(3) Inspection of interior and exterior containment surfaces and components for evidence of deterioration or damage.

(4) Containment sump water levels below high level mark.

(5) ILRT measurement system properly installed and functionally checked.

(6) Pressurization system in service. Three 900 cfm, one 1200 cfm and one 1500 cfm capacity air compressors were available for this ILRT.

(7) Pressurization system tested, including proper operation of the air compressors, after-coolers, moisture separators, air dryers, pressurization system manifold and discharge spool. This system test did not identify that the cooling water to the after-cooler was connected up backwards, due to its short duration and minimum system information.

(8) Containment ventilation system adjustments completed.

(9) Valve lineups completed.

(10) Containment temperature survey to verify temperature sensor locations. A licensee survey was performed prior to the ILRT with some containment ventilation fans running.

No violations or deviations were identified.

c. Observation of Work and Work Activities

Prior to the ILRT, the regional inspector performed containment area surveys for pressurized components (such as tanks, fire extinguishers, etc.), valve lineups and instrument location assignments within the Containment Building. The purpose of the instrument survey was to locate and evaluate the placement of the temperature sensors and dewpoint sensors. This inspection revealed that the sensors were located within the tolerances of the installation procedures. The operation of the pressurization equipment (air compressors, after-coolers and air dryers) used for pressurization of the Containment Building was inspected to assure that procedures for prevention of potential problems were enforced. This included evidence of checking the pressurizing air for indications of oil contamination, establishment of communications

between the ILRT control center and the pressurization station, adequate supply of cooling water to the after-coolers, and that control of the after-cooler air temperature was being maintained during pressurization. During initial pressurization, it was discovered that the cooling water supply to the after-cooler was incorrectly connected to the after-cooler discharge nozzle and the after-cooler was not adequately cooling the air. The cooling water supply was connected to the correct inlet nozzle and the expected after-cooler discharge air temperature was obtained.

The inspector witnessed selected portions of the following ILRT activities listed below and noted the time expended to perform each:

(1) Initial pressurization to 51 psig (65.7 psia) + 0.4/-0 psig/psia. Approximately 15 hours.

(2) ILRT stabilization. Approximately 6 hours.

(3) ILRT data acquisition.

(4) Performance of ILRT. Approximately 24 hours.

(5) Leak rate verification test stabilization. Approximately 1 hour.

(6) Leakage rate verification test. Approximately 6.5 hours, with an imposed leak rate of 4.4 standard cubic feet per minute (SCFM).

(7) Initial Containment Building depressurization.

Applicable electrical and mechanical penetrations were inspected. Applicable portions of the valve lineups were inspected to see that they were completed in accordance with procedure and that no unidentified artificial barriers were erected.

The overall performance of the ILRT crew members was observed by the inspector. Attributes evaluated were: availability of test procedures, test prerequisites being met, proper plant systems in service, special test equipment calibrated and in service, and crew action timely and correct. Crew members had received ILRT training prior to the test, and this appeared evident by satisfactory performance of their duties.

The licensee's preliminary results for the twenty-four hour type A test, which did not include type B or C additions, was a total time calculated leakage rate of 0.041 wt. % per day with a 95% upper confidence limit (UCL) of 0.051 wt. % per day. The licensee's maximum allowable leak rate for this test was 0.090 wt. % per day. For information only, a mass-point analysis provided a calculated leak rate of 0.049 wt. % per day with a 95% UCL of 0.051 wt. % per day. A six and one-half hour verification test was performed with an imposed leak rate of approximately 4.4 SCFM or 0.12% per day of containment air mass. The licensee verification test produced a

total time calculated leak rate of 0.147 wt. % per day. The total time analysis of the verification test leakage rate provided an acceptance criteria of 0.131 to 0.191 wt. % per day. For information only, the mass point analysis of the verification test provided a calculated leak rate of 0.141 wt. % per day and an acceptance criteria of 0.139 to 0.199 wt. % per day. These preliminary results appear to be within the latest allowed acceptance criteria.

No violations or deviations were identified.

3. Licensee Actions on Previous Inspection Findings

a. (Closed) Followup Item 50-206/86-20-07: Operability of Leaking Batteries

This item identified a concern about the leaking condition of the number 1 battery in Unit 1. The NRC concurred that the leaking condition should not affect the functionality of the battery, but were concerned that final corrective action had not been initiated. The licensee has performed weekly inspections and quarterly surveillance tests of this battery, to assure it is in a fully operable condition. The issuance of Nonconformance Report (NCR) number S01-P-5226, Revision 1 on October 14, 1987, directed the replacement of the twenty-six leaking cells per maintenance order no. 8505275200 (during the cycle X refueling outage).

The licensee has taken appropriate actions, therefore this item is closed.

b. (Closed) Followup Item 50-206/87-05-03: Recategorize 17 Check Valves as "AC" for IST Purposes

This item identified that as the result of the Unit 1 water hammer event of November 21, 1985, 17 check valves in the feedwater system and auxiliary feedwater system had been replaced after the event and the IST program valve test requirements revised for those valves. However the valves in question were still designated in the IST program as category "C" valves instead of as category "AC" valves. The licensee issued Temporary Change Notice (TCN) No. 5-20 to Engineering Procedure S01-V-2.15, Revision 5, "In Service Testing of Valves Program", on September 11, 1987 to recategorize the identified valves.

The licensee has taken appropriate actions, therefore this item is closed.

c. (Closed) Followup Item 50-206/87-05-04: Should Valve FCV-5051 be Included in IST Program

This item questioned whether valves which can be controlled from the licensee's dedicated shutdown (DSD) panel should be included in the valve IST program. The licensee identified that only valve FCV-5051 had its position indicated on the DSD panel, and was not included in

the IST program. The licensee issued Problem Review Report (PRR) SO-133-87 dated June 8, 1987 to review this concern on valve FCV-5051. The licensee obtained additional information from NRR, as identified in a memorandum from P. Croy to file (dated August 10, 1987), that stated "components which are installed only for compliance with Appendix "R" of 10 CFR 50, such as valve FCV-5051 in the Songs 1 dedicated and alternate shutdown systems, do not have to be included in the IST program".

Based on the above memorandum and review of references identified in this memorandum, valve FCV-5051 does not have to be in the IST program at this time, and this item is closed.

d. (Closed) Followup Item 50-206/87-05-05: Incorporation of Specific Valve Stroke Timing Method In Valve Test Procedures

During a review of Unit 1 valve test procedures, it was noted that the method to be used for obtaining valve stroke times was not specified. The licensee issued TCN No. 6-6 to Revision 6 of Operating Instruction SO1-12.4-2, "Operations In Service Valve Testing," dated August 4, 1987 to identify when "stroke time" starts and stops.

The licensee has identified that the above TCN fulfills their commitment to add a valve stroke time technique to appropriate procedures and ensure valve stroke timing consistency in accordance with the requirements of IWV-3413a of Section XI of the ASME Code. It appears the licensee has taken the action to clarify a valve stroke timing method, therefore this item is closed.

4. Exit Meeting

The inspector held a meeting with the licensee representatives denoted in paragraph 1, on March 21, 1988. The scope of the inspection and the inspector's findings up to the time of the meeting, as noted in this report, were discussed. At this meeting, the inspector also identified that additional information had been requested from Compliance on an open item.

It was identified that this material would be reviewed in the Region V offices and the inspector's findings documented in this report. The inspection period for this report was extended to April 8, 1988, to provide the licensee's compliance organization additional time to provide information on what licensee actions were taken on Generic Letter No. 85-22, "Potential for Loss of Post-LOCA Recirculation Capability Due to Insulation Debris Blockage." Since additional information was not available by April 8, 1988, the licensee actions taken for this Generic Letter in Unit 1, will be covered in a future report.