

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No: 50-206
License No: DPR-13

Report No: 50-206/97-16

Licensee: Southern California Edison Co.
P.O. Box 128
San Clemente, California

Facility: San Onofre Nuclear Generating Station, Unit 1

Location: San Clemente, California

Dates: June 30 - July 3, 1997

Inspectors: Louis C. Carson II, Health Physicist
J. Vincent Everett, Health Physicist
Michael K. Webb, Project Manager

Approved: D. Blair Spitzberg, Ph.D., Chief
Nuclear Materials Inspection and Fuel Cycle/Decommissioning Branch

Attachment: Supplemental Information

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station NRC Inspection Report 50-206/97-16

This routine, announced inspection of Unit 1 included aspects of the licensee's safety evaluations, plant operations, fire safety program, management organization, fuel storage and spent fuel pool (SFP), radiation protection program, material condition, and radiological effluent/environmental monitoring.

Unit 1 10 CFR 50.59 Safety Evaluations

- The licensee had adequately documented changes to the facility as required by 10 CFR 50.59. The licensee had addressed the decommissioning activity limitation requirements of 10 CFR 50.82(a)(6) through a plant configuration control procedure (Section 2.0).

Plant Status and Operations Verification

- Facility material condition, housekeeping, and cleanliness were excellent. A detailed tour within containment and the SFP areas verified that structures, systems, and components continue to contribute to the safe storage of spent fuel (Section 3.0).
- The licensee had implemented a fire protection and prevention program that met license requirements. No abnormal fire loading conditions were identified (Section 3.0).

Occupational Exposure During SAFSTOR and DECONTAMINATION

- A high quality control room pre-job brief for the annual containment inspection contributed to the safe and successful accomplishment of this activity (Section 4.0).
- The licensee's organization and lines of responsibility complied with its Post Shutdown Decommissioning Activities Report (PSDAR) and Permanently Defueled Technical Specifications (PDTs). The organization and staffing were appropriate for Unit 1's shutdown and defueled condition (Section 4.0).
- The radiation protection program met requirements and was appropriate for Unit 1's shutdown and defueled condition. Radioactive materials, radiation work activities, and radiation areas were being controlled in accordance with the applicable requirements (Section 4.0).

Radwaste Treatment, Effluent, and Environmental Monitoring

- The licensee's Annual Effluent Release Report, Radiological Environmental Monitoring Program, and effluent monitoring programs met the requirements of the PDTs and Offsite Dose Calculational Manual (Section 5.0).

Spent Fuel Pool Monitoring

- The Unit 1 spent fuel pool was in compliance with technical specifications for water level, temperature, and chemistry. The water clarity and condition of the spent fuel pool structures were observed during a walkdown of the facility. No problems or concerns were identified (Section 6.0).

Report Details

1 Summary of Plant Status

San Onofre Nuclear Generating Station (SONGS) is a three unit site of which Unit 1 had been permanently shutdown. Unit 1 began commercial operation on January 1, 1968, and was permanently shutdown on November 30, 1992. Since that date, the licensee had defueled the reactor, stored the spent fuel in the site's SFPs, and placed the unit in SAFSTOR. Unit 1's license was amended for possession-only status in March 1993.

2 10 CFR 50.59 Safety Evaluation Program (37001)

2.1 Inspection Scope

The inspectors reviewed the licensee's administrative procedures and other documents associated with the 10 CFR 50.59 safety review process. In addition, the inspectors reviewed several 10 CFR 50.59 safety evaluation reviews prepared by the licensee at San Onofre, Unit 1, since June 1996, and selected 10 CFR 50.59 training and qualification records for Unit 1 personnel.

2.2 Observations and Findings

The licensee used Southern California Edison (SCE) Form 26-548, "Engineering Design Program 10 CFR 50.59 Safety Evaluation," to document its 10 CFR 50.59 evaluations. The questions posed on SCE Form 26-548 are based on the "SONGS Safety Analysis Report." The SONGS 1 Updated Final Safety Analysis Report (FSAR) was last revised on December 17, 1991. Based on the regulations in effect at that time, the next Unit 1 FSAR would have been due in December 1992. On August 27, 1992, SCE submitted an exemption request to NRC which would have relieved the licensee from having to update the Unit 1 FSAR due to Unit 1's impending shutdown in November 1992. Subsequently, the regulations were revised to require FSAR updates to occur 6 months following refueling, but not later than 24 months after the last update. This changed the due date for update of the Unit 1 FSAR to September 1993. Unit 1 was permanently shutdown on November 30, 1992, and its possession-only license amendment became effective on March 9, 1993. Because the unit was shutdown and no longer authorized to operate, the exemption request was withdrawn based on the 10 CFR 50.71(e) requirement that FSAR updates were required for plants that are "licensed to operate." In the SONGS Unit 1 decommissioning plan submittal in November 1994, the licensee indicated that the decommissioning plan would become the licensing basis upon its approval. Consequently, the licensee has continued to conduct its 10 CFR 50.59 evaluations against the 1991 safety analysis report in anticipation of NRC approval of its decommissioning plan.

On August 28, 1996, changes to NRC regulations became effective that removed the requirement for licensees to submit decommissioning plans, and revised

10 CFR 71(e)(4) to require permanently shutdown power reactor facilities to revise their safety analysis reports at 24-month intervals. Therefore, although the licensee had been in compliance with the previous regulations in conducting its 10 CFR 50.59 evaluations against the 1991 safety analysis report, the licensee must submit a revised FSAR by August 28, 1998, and 10 CFR 50.59 evaluations conducted subsequent to that date must be based on the revised safety analysis report.

The SCE Form 26-548 included 12 questions, the last five of which applied only to Unit 1. The five questions were developed in response to information provided in an NRC memorandum dated January 14, 1993, "Staff Requirements - Briefing by OGC on Regulatory Issues and Options for Decommissioning Proceedings (SEC.-92-382)." This memorandum discusses what activities may be allowed at a shutdown plant prior to approval of a decommissioning plan. Although the NRC memorandum does not require these issues to be addressed in the 10 CFR 50.59 process, the licensee had chosen to answer these "decommissioning questions" by posing questions 8 through 12 on Form 26-548.

The licensee used Engineering Design Quality Procedure SO1-XXIV-10.10, "Unit 1 Postshutdown Configuration Control," to control configuration change activities for SONGS 1. Attachment 3 of this procedure requires that the same five questions discussed in the 10 CFR 50.59 evaluations be asked as part of any proposed plant change authorizations. The NRC has issued newer guidance (in 10 CFR 50.82(a)(6)) for permanently shut down plants to consider in conducting decommissioning activities. The three issues discussed in the regulations regard decommissioning activities that could (1) foreclose release of the site for possible unrestricted use; (2) result in significant environmental impacts not previously reviewed; and (3) result in there no longer being reasonable assurance that adequate funds will be available for decommissioning. Therefore, while the five questions asked in SO1-XXIV-10.10 met the intent of the revised guidance, they did not directly address the three questions posed in the revised regulations. During the period of inspection, the licensee generated an Action Request (AR) which requested that the Nuclear Engineering Design Organization (NEDO) review SO1-XXIV-10.10 and implement a procedure change to ensure that 10 CFR 50.82(a)(6) is more directly addressed.

The inspector reviewed several 10 CFR 50.59 evaluations prepared by the licensee for the following activities: Field Change Notice (FCN) F5748J, FCN F11666E, FCN F12649M, and Design Change Notice (DCN) ABG-9840. The safety evaluations reviewed were determined to be complete, accurate, and in compliance with 10 CFR 50.59.

2.3 Conclusions

The inspectors found that the licensee had adequately documented changes to the facility as required in 10 CFR 50.59. Furthermore, the licensee initiated an action request to revise Procedure SO1-XXIV-10.10, "Unit 1 Postshutdown Configuration Control," to ensure that 10 CFR 50.82(a)(6) is more directly addressed.

3 Operational Safety Verification (71707) and Fire Protection/Prevention Program (64704)

3.1 Scope of the Facility Tours

The inspectors toured the facility to assess the status of structures, systems, and components in SAFSTOR. This effort involved tours of the radiation control area, containment, control room, and the SFP building. Inspections included an assessment of housekeeping, fire hazards, radiation material control, access, and lighting.

3.2 Observations and Findings

Inspectors toured accessible areas within containment except for the reactor annulus space due to radiation protection considerations. In areas inspected, unfettered access was afforded to all components and systems. Permanent lighting within containment was sufficient to support a thorough inspection of the areas toured. Transient materials such as scaffolding, tools, and waste containers were appropriately stored and segregated representing good material control. Floors, horizontal surfaces, and corners within containment were free of excessive dirt or waste. No excessive corrosion was identified on any systems, indicating that the surfaces had not been wet. Containment sump motors were in good material condition, and sumps were dry and free of trash that could potentially clog the sump pumps during operation.

The inspectors and licensee representatives performed detailed inspections to identify water leakage from systems or free standing water, both of which would indicate a problem. Floors, systems, and components were observed to be dry; no standing water was observed. Also, there was no indication of residue from evaporated water. Observation of the fuel transfer chute blind flange and the horizontal surfaces adjacent to and surrounding the reactor head flange verified that surfaces were dry. Standing water in these areas or leakage from the transfer chute blind flange could possibly indicate a degradation in the SFP boundary integrity. The licensee conducted its inspection in accordance with Procedure SO1-4-25, "Ventilation System Operation," which provided a checklist to assure that important considerations were inspected and assessed.

Inspectors observed that the containment contained low combustible loading. This included observing for fire loading such as electrical cabling, film oils on components and equipment, fire-resistant scaffolding, and miscellaneous pump and motor-operated valve oils. Combustibles observed in containment included plastic bags used for controlling radioactive contamination, tygon hoses, and articles used for housekeeping. Inspectors noted that the licensee did not use containment as a radioactive storage location. Inspectors determined that materials in containment did not represent an adverse fire loading.

The inspectors toured the facility with personnel who routinely performed equipment checks of the auxiliary building, SFP cooling and component cooling water (CCW) systems. Inspectors observed good material conditions, unfettered access, and good

housekeeping. The inspectors determined that the CCW system, which cools the SFP cooling water via a heat exchanger appeared to be in good operational condition.

3.3 Conclusions

Facility material condition, housekeeping and cleanliness were excellent. A detailed tour of containment revealed that structures, systems, and components continue to contribute to the safe storage of spent fuel and demonstrate appropriate material integrity. The licensee had implemented a fire protection and prevention program that met license requirements.

4 **Occupational Exposure During SAFSTOR and DECONTAMINATION (83100)**

4.1 Inspection Scope

Inspectors reviewed the licensee's organization and the requirements in Section D6.2 of the PDTS which define lines of authorities and responsibilities. The PDTS, Table D6.2-1, "Minimum Shift Crew Composition," lists the minimum shift composition required to ensure that personnel are available in case of an emergency. The inspectors reviewed licensee activities to determine the adequacy of the radiation protection program for Unit 1's defueled operations and to determine whether the licensee was in compliance with the requirements of PDTS D6.11. This included a review of the radiation protection procedures, survey records, and as low as is reasonably achievable (ALARA) reviews. The inspectors reviewed the adequacy of the licensee's radiation protection program pertaining to inspecting the Unit 1 containment. The scope of this inspection effort included observing the Unit 1 containment entry tailboard and pre-job briefing meeting.

4.2 Observations and Findings

a. Organization

Licensee representatives stated that 104 individuals have supported Unit 1's SAFESTOR operations during 1997, and 17 individuals were totally dedicated to Unit 1. Unit 1 support included workers from the following departments: operations, maintenance, emergency preparedness, station technical, chemistry, health physics, security, training, site support, nuclear engineering and construction, nuclear oversight, nuclear regulatory affairs, and nuclear project management. Most workers assigned to Unit 1 also had responsibilities for Units 2 and 3 operations.

A review of selected procedures indicated that the licensee had established an organization and defined responsibilities that were consistent with the PSDAR and PDTS. Interviews with selected managers indicated that the procedures were being implemented in a manner that ensured the safety of the Unit 1 spent fuel. Interviews with licensee representatives indicated that SONGS maintained much of its Unit 1 experienced staff due to cross-training programs with Units 2 and 3 workers.

The inspectors observed the number of on-site crew members present and the conduct of operations. Inspectors observed that at least one individual qualified to stand watch in the control room was in the control room area, in accordance with PDTs. The actual number of personnel that were on duty during the inspection met or exceeded the minimum total established in the PDTs.

b. Radiation Protection and As Low As Is Reasonably Achievable (ALARA)

Inspectors reviewed ALARA planning and Radiation Exposure Permit (REP) development for work activities conducted in late 1996 and in 1997. Inspectors noted that the Unit 1 collective personnel dose for 1996 was 2.98 person-rem. The collective dose through June 1997 was 0.69 person-rem. Inspectors reviewed REPs that were issued for Unit 1 containment entries and maintenance activities in 1996 and 1997. Inspectors reviewed Unit 1 survey log records, area plot plans, and survey pre-job planning cards. Detailed periodic radiation and contamination surveys had been performed in accordance with the licensee's radiation survey procedures.

The tailboard meeting discussed in Section 2 of this report covered radiation safety. Key radiological considerations were provided by the lead health physics technician, such as known hot spots and expected loose surface contamination and general area radiation levels. The REP was reviewed in detail, and a good overall radiological perspective was provided which included ALARA considerations. The radiation exposure dose estimates were predetermined based on previous containment radiation surveys and provided at the tailboard for the participants to be used as reference values while performing their duties. Health physics technicians provided direct oversight of the activities within containment.

During the Unit 1 facility tour of the containment and SFP facilities, radiation exposure levels measured by inspectors were in agreement with the licensee's survey records and postings. Inspectors determined that detailed work planning, and radiation protection pre-job briefings were adequate for the tasks being performed. REP and ALARA evaluations had been conducted adequately by radiation protection staff.

c. Pre-Job Brief for Containment Entry.

The licensee opens and inspects the Unit 1 containment at least annually to assess the material status of containment structures, systems, and components maintained in a SAFSTOR configuration. Inspectors observed the licensee's pre-job brief (i.e., tailboard) for containment entry to ascertain whether important personnel and equipment safety considerations were provided to the plant staff prior to containment entry. Inspectors observed health physics technicians and plant personnel conduct radiation protection practices. While in SAFSTOR, systems inside containment are not active and not necessary for the safe storage of spent fuel. However, an inspection of containment is important to verify that conditions have not degraded to a point representing an unsafe radiological or facility situation. Systems that penetrate containment, such as fire water and CCW were permanently isolated with closed valves or blind flanges. Some containment systems, such as the reactor vessel and system

low points contained water; however, no volumetric or pressurized water existed. With the exception of telephone communication supply power, the licensee shuts off electrical power to containment when the containment is closed.

The licensee conducted the containment entry tailboard to assure that all personnel were briefed on procedural requirements, personnel safety considerations, and the scope of activities to be performed. The purpose of the containment entry was to perform a containment inspection, test the containment sump level alarm, and a fire system alignment check. The control room Shift Supervisor (SS), the senior operator on shift, conducted the brief using Procedure S023-0-44, "Professional Operator Development Program," which provided guidance on the conduct of tailboards. The SS also stepped through Procedure SO1-4-44, "Containment Access System Operation," focusing on precautions, prerequisites, and the procedures steps that would be conducted. A detailed review was conducted to assure all personnel understood entry and egress requirements, command and control responsibilities, and communications. The SS assured proper containment ventilation, purge duration, temperature, humidity prior to entry, and stressed the importance of both personnel and plant safety. Senior plant management observed the brief, questioned key personnel in their duties, and provided insight to the safe accomplishment of this activity.

For the containment activities noted above, the lead person responsible for the safe accomplishment of the activity provided a summary of the activity to be performed. These briefs were generally technical and added value to the tailboard. All personnel became familiar with other activities in case assistance was needed. Inspectors observed that all personnel performing and supporting the containment entry were in attendance at the tailboard.

4.3 Conclusions

The licensee's organization and lines of responsibility complied with its PDTs and PSDAR. The organization and staffing were appropriate for Unit 1's shut down and defueled condition.

The radiation protection program met requirements and were appropriate for Unit 1's shutdown and defueled condition. Radioactive materials, radiation work activities, and radiation areas were being controlled in accordance with the requirements of 10 CFR Part 20, PDTs D6.8.1, PDTs D6.8.4, PDTs D6.11, and PDTs D6.12.

The inspectors concluded that the tailboard contributed to the safe accomplishment of the containment entry. Activities within containment were well orchestrated and conducted safely illustrating the effectiveness of the preplanning. Appropriate management oversight was provided.

5 Radwaste Treatment, Effluent and Environmental Monitoring (84750)

5.1 Scope

Inspectors reviewed the licensee's radwaste treatment, radiation effluent release, and environmental monitoring programs for compliance with the PDTs. Inspectors reviewed the licensee's compliance with the PDTs as related to the Offsite Dose Calculation Manual (ODCM), radwaste system operations, radiation effluent monitoring systems, and unplanned radiological releases. Inspectors reviewed radiation effluent monitor calibration records to determine compliance with the 18-month calibration frequency identified in ODCM Tables 4.2 and 4.4. Inspectors reviewed the SONGS 1996 Radiological Environmental Monitoring Program (REMP), the 1996 Annual Radioactive Effluent Release Report (ARERR), and the 1996 Annual Radiological Operating Report (AREOR) to determine compliance with PDTs D6.8.1(l), D6.8.4(b), and D6.9.1.3.

5.2 Observations and Findings

The Operations Department Health Physics Division had responsibility for on-site contamination and release events. The Chemistry Division had responsibility for the monitoring of effluent release pathways to the environment and maintaining effluent radiation monitors operational.

Changes to the ODCM, the gaseous radwaste treatment system, and uncontrolled or unplanned releases at Unit 1 were reported in the 1996 ARERR in compliance with the requirements of the PDTs. This review revealed that previously identified inaccurate ODCM statements had been corrected in the 1996 ARERR. Unplanned radioactive releases from Unit 1 in 1996 had been reviewed by the SONGS Vice-President of Nuclear Generation and the Nuclear Safety Group and documented in the 1996 ARERR. According to the licensee's records, the effluent monitors had been calibrated as required by the ODCM. Inspectors reviewed the operational status of liquid and gaseous effluent radiation monitors and the radiation effluent monitor surveillance and operability records and found them to have been maintained in compliance with the ODCM. Inspectors verified that reviews or evaluations were performed by qualified individuals and reviewed by appropriate managers. Monthly Effluent Reports from June 1996 through May 1997 were found to be appropriately documented.

There were no major changes reported in the 1996 REMP or AREOR that affected Unit 1. The ARERR and AREOR were implemented as described in the ODCM and PDTs. Environmental data analysis was appropriately explained and graphically trended within the 1996 AREOR. Inspectors reviewed the Land Use Census data that was included in the 1996 AREOR. Inspectors determined that the licensee had appropriately assessed the land use around the facility, which included documenting significant changes.

5.3 Conclusions

The licensee's Annual Radioactive Effluent Release Report and environmental and effluent monitoring programs met the requirements of the license and ODCM.

6 **Spent Fuel Pool Monitoring (86700)**

6.1 Inspection Scope

The inspectors conducted a walkdown of the spent fuel pool and performed a review of numerous daily logs and records to verify compliance with the technical specifications.

6.2 Observations and Findings

The Unit 1 spent fuel pool had 216 available slots for spent fuel. Of these, 207 contained spent fuel elements and four contained trash containers. Licensing requirements for the spent fuel pool were specified in Sections D3.1 and D4.1 of the PDTs and included water level, temperature, chemistry and periodic surveillances.

A walk down of the spent fuel pool area was conducted. The water clarity was excellent. The recirculation system was observed to be functioning. The temperature of the water was confirmed at 75°F on the local temperature gage. The facility appeared orderly and properly posted. No materials were observed near the spent fuel pool where they could fall into the pool. The facility structure appeared in good condition. No obvious deterioration of the building was evident.

SONGS Unit 1 demonstrated compliance with PDTs requirements for the spent fuel pool using operating instruction S01-12.1-4, "Control Room Daily Log," Attachment 1: Surveillances. Data was collected and recorded on the daily surveillance logs by both the day shift and the night shift crew. The daily surveillance logs for the past four months were reviewed. In addition, trending graphs were reviewed which covered the period from late 1994 through June 1997.

Technical Specification D3.1.1, Spent Fuel Pool Temperature, required the pool water to be maintained at less than 150°F. At least one spent fuel pool cooling train was required to be functional. Technical Specification D4.1 required daily verification of the spent fuel pool water temperature. A review of the daily surveillance logs indicated temperatures were typically maintained between 60°F to 80°F over the four month period reviewed and one spent fuel pool cooling train was confirmed daily as operational. Documentation and sign-off of the daily surveillance logs were complete.

Technical Specification D3.1.2 required the water level of the spent fuel pool to be maintained at an elevation of not less than 40 feet 3 inches. Technical Specification D4.1 required daily verification. A review of the daily surveillance logs indicate that water level was documented on each shift and was typically maintained between 40 feet 8 inches and 40 feet 9 inches. The lowest readings recorded over the four month period reviewed were 40 feet 6 inches.

Technical Specification D3.1.3 established upper limits for chlorides and fluorides in the spent fuel pool water of 0.15 parts/million (ppm). Technical Specification D4.1 required monthly chemical analysis. A review of the SONGS Unit 1 spent fuel pool cooling system data trending report indicated that for the past 12 months, the chlorides and fluorides were maintained below 0.04 ppm, with typical readings of 0.01 to 0.02 ppm. The data had been plotted based on weekly analysis data. The licensee also tracked the boron level in the spent fuel pool. Boron levels for the past year had been maintained at 2100 to 2150 ppm.

The status of the spent fuel pool liner was discussed with the licensee. In May 1995, a leak occurred which required repair to the spent fuel pool liner. Since that repair, the leak rate of the spent fuel pool had decreased to approximately three gallons/week. This leak rate had been relatively steady over the previous year.

6.3 Conclusion

The Unit 1 spent fuel pool was in compliance with technical specifications for water level, temperature, and chemistry. The water clarity and condition of the spent fuel pool structures were observed during a walkdown of the facility. No problems or concerns were identified.

7 **Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the exit meeting on July 3, 1996. The licensee did not identify as proprietary any information provided to, or reviewed by the inspectors.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Custer, Unit 1 Plant Superintendent
D. Cox, Compliance Engineer
D. Dick, Chemistry/Effluent Supervisor
G. Gibson, Manager, Compliance
R. Krieger, Vice President, Nuclear Generation
P. Knapp, Manager, Health Physics
T. Llorens, Unit 1 Licensing
J. Rainsberry, Manager, Nuclear Regulatory Affairs
J. Scott, Health Physics Supervisor
R. Waldo, Manager, Operations

INSPECTION PROCEDURES USED

IP 37001: 10 CFR 50.59 Safety Evaluation Program
IP 71707: Operational Safety Verification
IP 83100: Occupational Exposure During SAFSTOR and DECON
IP 84750: Radwaste Treatment, Effluent and Environmental Monitoring
IP 86700: SFP Monitoring

ITEMS OPENED AND CLOSED

Opened

None

Opened and Closed

None

Closed

None

LIST OF ACRONYMS USED

ALARA	as low as is reasonably achievable
AR	action requests
AREOR	Annual Radiological Operating Report
ARERR	Annual Radioactive Effluent Release Report
CCW	component cooling water
DCN	Design Change Notice
IP	Inspection Procedure
NEDO	Nuclear Engineering Design Organization
ODCM	Offsite Dose Calculation Manual
PDTS	Permanently Defueled Technical Specification
PSDAR	Post Shutdown Decommissioning Activity Report
REMP	Radiological Environmental Monitoring Program
REP	radiation exposure permit
SCE	Southern California Edison
SFP	spent fuel pool
SONGS	San Onofre Nuclear Generating Station
SS	Shift Supervisor
UFSAR	Updated Final Safety Analysis Report