UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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November 22, 2005

Mr. Harold B. Ray, Executive Vice President
Southern California Edison Co.
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, California 92674-0128

SUBJECT: NRC INSPECTION REPORT 050-00206/05-012

Dear Mr. Ray:

An NRC inspection was conducted on October 24-27, 2005, at your San Onofre Nuclear Generating Station, Unit 1 facility. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspection included an examination of selected procedures and representative records, observations of activities, and interviews with personnel. The enclosed report presents the results of that inspection. The inspection determined that you were conducting decommissioning activities in compliance with regulatory and license requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact the undersigned at (817) 860-8191 or Mr. Robert J. Evans, Senior Health Physicist, at (817) 860-8234.

Sincerely,

/RA/

D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle and Decommissioning Branch

Docket No.: 050-00206
License No.: DPR-13

Enclosure:
NRC Inspection Report
050-00206/05-012

cc w/enclosure:

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No:	050-00206
License No:	DPR-13
Report No:	050-00206/05-012
Licensee:	Southern California Edison Co. P.O. Box 128 San Clemente, California 92674
Facility:	San Onofre Nuclear Generating Station, Unit 1
Location:	San Clemente, California
Dates:	October 24-27, 2005
Inspector:	Robert J. Evans, P.E., C.H.P., Senior Health Physicist Fuel Cycle & Decommissioning Branch
Approved By:	D. Blair Spitzberg, Ph.D., Chief Fuel Cycle & Decommissioning Branch
Attachment:	Supplemental Inspection Information
ADAMS Entry:	IR05000206-05-012 on 10/24/2005 - 10/27/2005; Southern California Edison Co., San Onofre Nuclear Generating Station; Unit 1. Decommissioning Report. No VIOs.

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Unit 1
NRC Inspection Report 050-00206/05-012

This inspection was a routine, announced inspection of decommissioning activities being conducted at San Onofre Nuclear Generating Station, Unit 1 facility. Areas inspected included decommissioning performance and status review; inspection of final surveys; and followup of a previous licensee event report. Overall, the licensee was conducting decommissioning safely and in accordance with regulatory and procedural requirements.

Decommissioning Performance and Status Review at Permanently Shutdown Reactors

- The radiologically restricted area was adequately controlled and posted. Equipment required to be in service was found to be functional in accordance with Offsite Dose Calculation Manual and procedural requirements (Section 1).

- The licensee was implementing a water management plan in accordance with commitments made in a license amendment request recently submitted to the NRC (Section 1).

- The licensee's occupational exposures continued to decline over time, indicative of a reduction in the radioactive source term at Unit 1 combined with effective As Low As Reasonably Achievable (ALARA) and job planning programs (Section 1).

Inspection of Final Surveys at Permanently Shutdown Reactors

- The inspector conducted a confirmatory survey of the outfall culvert, and the survey measurements were less than the acceptance criteria established by the licensee for building surfaces (Section 2).

- The inspector noted and discussed with the licensee a minor discrepancy between how background samples had been collected within the culvert survey unit and the guidance provided in the Multi-Agency Radiation Survey and Site Investigation Manual (Section 2).

- The licensee's final survey results for three survey units were reviewed, and the results were generally being documented in accordance with procedural instructions. Minor exceptions where the documentation did not follow instructions were brought to the licensee's attention (Section 2).

Followup

- During February 2005, the licensee reported a leaking plutonium-beryllium neutron source to the NRC. The status of the source was reviewed during this inspection. The licensee plans to ship the leaking source in a proper Department of Transportation specification package to the Department of Energy/Los Alamos National Laboratory for permanent disposal in the near future (Section 3).

Report Details

Summary of Plant Status

San Onofre Nuclear Generating Station, Unit 1 was permanently shut down during November 1992 and was permanently defueled by March 1993. The unit remained in SAFSTOR until June 1999, when decommissioning was initiated. At the time of this inspection, the licensee was conducting decommissioning activities under the DECON option as stated in its Post Shutdown Decommissioning Activities Report dated December 15, 1998. DECON is defined as the immediate removal and disposal of all radioactivity in excess of levels which would permit the release of the facility for unrestricted use.

Work completed since the previous inspection included installation of two groundwater dewatering pumps to support yard sump construction and turbine building demolition, final demolition of the turbine building structure, and removal of bulk waste material from three radwaste holdup tanks. Work in progress during the inspection included containment sphere demolition, filling of the turbine building outfall culvert with concrete slurry, removal of equipment from the radwaste building, and installation of the new yard sump. The licensee plans to place the new yard sump and related flow paths into service around December 2005 following NRC approval of a recently submitted license amendment request.

During May 2005, decommissioning of the containment sphere stopped when the primary work contractor suspended operations. The licensee recently recommenced the containment demolition project; although, this work activity continued to be behind schedule. Completion of this project is necessary to support future expansion of the Independent Spent Fuel Storage Installation (ISFSI) pad.

1 Decommissioning Performance and Status Review at Permanently Shutdown Reactors (71801)

1.1 Inspection Scope

The inspector evaluated whether the licensee and its contracted workforce were conducting decommissioning activities in accordance with license and regulatory requirements.

1.2 Observations and Findings

a. Site Tours/Control of Decommissioning Activities

The inspector conducted tours of the Unit 1 facility to observe radiological area postings and boundaries. Access to the restricted and contaminated areas was controlled by radiation caution signs, barricades, boundary lines, locked doors, and locked gates. Radiological boundaries were well defined and postings were up-to-date in all areas.

The inspector conducted independent radiological surveys in the radiologically restricted area using a Ludlum Model 2401-P survey meter (NRC No. 21190G, calibration due date 09/23/06). No abnormal radiological survey results were observed, and all ambient gamma exposure rate measurements were in agreement with posted radiation levels.

During mid-October 2005, the licensee became aware that several radioactive material labels located inside the radiologically restricted area had incomplete or inaccurate information. The licensee issued an Action Request to document the issue and to formulate corrective actions. Corrective actions included reviewing and updating all Unit 1 labels. During the site tours, the inspector conducted a review of randomly selected labels and found that the labels provided complete and accurate information throughout Unit 1. In accordance with Action Request instructions, the licensee will continue to inspect labels for compliance with regulatory and procedural requirements to ensure a negative trend does not exist.

The inspector observed equipment in service to ensure that these components were being operated in accordance with the Offsite Dose Calculation Manual (ODCM) or plant procedures. Equipment required to be in service included the gaseous effluent monitor R-1254 and the yard sump radiation monitor R-2101. At the time of the inspection, monitor R-2101 was out of service because of electrical spiking problems. Since the yard sump had to be in service to support plant dewatering activities, the licensee implemented contingency actions in accordance with the OCDM including collection of grab samples on a daily basis. Other components still in service included the north salt water pump to provide liquid effluent dilution flow, three ventilation fans, two yard sump pumps, two intake structure sump pumps, the sewage treatment plant, and the fire protection system. The inspector observed selected process parameters such as flow rates to ensure that the parameters were within the expected ranges. No abnormal process parameter was identified.

b. Control of Water at Unit 1

The licensee previously elected to replace the existing yard sump with a new sump, in part, because of its plans to construct pump wells to draw down the local groundwater table to allow for decommissioning of subsurface components. The water table draw-down will provide “dry” subsurface conditions for excavation and backfill activities. Dewatering was expected to occur in seven phases to support various locations for excavating into the groundwater table.

The inspector observed the operation of the Phase I dewatering system. The two Phase I wells were placed into service during late-August 2005. The depth of the south well was about 60-feet below land surface, while the depth of the north well was about 51-feet below land surface. The south well provided a cone of depression to sufficiently support subsurface construction activities; therefore, the licensee normally operated only the south pump.

The groundwater collected during the first phase was being routed to the existing yard drain sump for normal sampling and discharge via the Unit 1 outfall. The combined dewatering flow was throttled to 525 gallons per minute (gpm) because of the limited capacity (600 gpm) of the current Unit 1 yard sump. Failure of a yard sump pump could result in overflow of the sump if dewatering flow exceeded the capacity of the remaining yard sump pump.

The licensee expects to continue with the first phase of dewatering for about 3 more weeks. The second dewatering phase is expected to be placed into service during

calender year 2006. This phase of dewatering flow is expected to be about 2600 gpm. Since this flowrate exceeds the capacity of the current yard sump, the licensee cannot place phase two wells into service until the new yard sump is placed into service. The new yard sump was still under construction during the inspection but was expected to be completed in the near future.

c. Occupational Radiation Exposures

The inspector reviewed the Unit 1 occupational exposure records for 2005. Total exposures through September 2005 were 12.618 person-rems with an occupational As Low As Reasonably Achievable (ALARA) goal of 24.687 person-rems. Work projects with the highest exposures during 2005 included health physics support activities, spent fuel building demolition, valve alley/radwaste demolition, and containment demolition. Future projects that have the potential for occupational exposures included demolition of the radwaste holdup tanks and spent resin storage tank.

For comparison, the total exposures for 2004 was 13.763 person-rems. These exposures were down significantly from 2003 (34 person-rems) and 2002 (61 person-rems). The reduction in exposures can be attributed to the removal of radioactive and contaminated components from the Unit 1 site in addition to improvements in ALARA practices and job planning.

1.3 Conclusions

The radiologically restricted area was adequately controlled and posted. Equipment required to be in service was found to be functional with setpoints in accordance with ODCM and procedural requirements.

The licensee was implementing a water management plan in accordance with commitments made in a license amendment request recently submitted to the NRC.

The licensee's occupational exposures continued to decline over time, indicative of a reduction in the radioactive source term at Unit 1 combined with effective ALARA and job planning programs.

2 Inspection of Final Surveys at Permanently Shutdown Reactors (83801)

2.1 Inspection Scope

The inspector reviewed the licensee's final status survey activities to determine compliance with site policy and procedure requirements. The inspection included a review of the completed final status survey reports and sample results. In addition, a confirmatory survey was performed in the former outfall culvert.

2.2 Observations and Findings

a. Confirmatory Survey of Outfall Culvert

The inspector conducted a confirmatory radiological survey of the former outfall culvert. This area of the plant was designated as a Class 3 area in accordance with guidance provided in NUREG-1575, Revision 1, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)." A Class 3 area is an area that is not expected to contain any residual radioactivity, or is expected to contain levels of residual radioactivity at a small fraction of the derived concentration guideline level (DCGL). The inspector confirmed that the licensee had conducted a sufficient amount of survey coverage for a Class 3 area prior to free-releasing the area. In addition, the licensee conducted an independent, third-party confirmatory survey to confirm its final survey results. The licensee's two surveys concluded that the area was free of residual radioactive material.

The inspector conducted a confirmatory survey to independently assess the radiological condition of the culvert. The survey included measurement of ambient gamma exposure rates and fixed surface contamination levels. The ambient gamma exposure rate measurements were collected using a Ludlum Model 19 microRoentgen meter (NRC No. 015544, calibration due date of November 16, 2005). The surface contamination survey was conducted using an Eberline E600 survey meter (NRC No. 063472, calibration due date of September 2, 2006) with Eberline SHP380AB alpha-beta probe.

The inspector collected background measurements using a section of unimpacted concrete cut from the circulating water substructure wall. This section of concrete had not been impacted by previous operations involving radioactive material. The instrument background averaged 286 counts per minute (cpm), resulting in a calculated instrument lower limit of detection of about 368 cpm. During the confirmatory survey, 20 different wall, floor, and ceiling locations were surveyed. The surface survey results ranged from 240 to 394 cpm, with an average of 308 cpm.

Only one survey point exceeded the lower limit of detection of the instrument, a suspect area identified by the licensee during its independent, third-party survey. This point measured 394 cpm, or 608 dpm/100 cm^2 over background. The licensee had established a surface contamination release criteria of 11,000 dpm/100 cm^2 in its white paper entitled, "Final Status Survey Plan for SONGS 1 Turbine Building Structures," dated August 19, 2005. The licensee's release criteria was a site-specific value derived from the NRC's screening values provided in Appendix H to NUREG-1757, Volume 2, "Consolidated NMSS Decommissioning Guidance." The inspector's highest fixed point measurement (608 dpm/100 cm^2) was well below the release criteria (11,000 dpm/100 cm^2) established by the licensee.

The ambient gamma exposure rates ranged from 16-19 microRoentgens per hour (µR/hr) throughout the culvert. Although the licensee had not established release criteria for exposure rates in this survey unit, the inspector determined that the exposure rates were comparable to background levels.

During a review of the licensee's final status survey results, the inspector noted that the licensee had collected its background measurements within the survey unit itself. MARSSIM recommends that reference areas (locations where background measurements are collected) should not be part of the survey unit being evaluated because reference area measurements are compared to the survey unit data. The licensee's final status survey results were reported as net measurements, with background subtracted. Following discussion of this potential discrepancy from MARSSIM guidance with licensee representatives, the licensee issued an Action Request to review the collection of background measurements.

Following completion of the confirmatory survey, the licensee elected to fill the culvert void with concrete slurry. The volume of culvert was estimated to be about 680 cubic yards. This structure will be left in place until the third phase of Unit 1 decommissioning, expected to commence concurrent with final remediation of the two operating units. Disposition of the culvert will be determined during this last phase of decommissioning.

b. Review of Final Status Survey Program Records

The inspector conducted a review of the licensee's final status survey controls. Recently, the licensee established and implemented a new Unit 1 decommissioning procedure SO1-XXVIII-6.2.5, "Comprehensive Ground Record Program For SONGS 1 Decommissioning Project," Revision 0. This procedure provided administrative controls for the generation, processing, storage, and retrieval of records documenting the radiological conditions of SONGS 1 to support future termination of the NRC license.

The licensee planned to conduct the final surveys by zone. The licensee had established eight zones in Unit 1. The inspector reviewed three record books, one in draft and two in final form. Record Book 1 documented the results of surveys in Zone 1, which included the areas of the former diesel generator building, administrative/control building, and east feedwater heaters. This document was completed in March 2004, prior to implementation of the comprehensive ground record program procedure. The final status survey results were less than the NRC's screening values listed in NUREG-1727, "NMSS Decommissioning Standard Review Plan." The inspector noted that this record book generally followed the guidance provided in the comprehensive ground record program requirements.

The inspector reviewed Record Book No. 8 which included the area of the former water reservoir. This report was finalized in September 2005. The inspector noted that this record book provided survey results but failed to provide comparison to the release criteria. The licensee issued an Action Request to conduct a review of the record book. The licensee will update the record book as necessary to incorporate the missing information.

The inspector also reviewed the licensee's preliminary data that will be included in Record Book No. 2C for the intake and outfall structure. The comprehensive ground record program document states that survey plans will be developed for each zone, and each plan will include acceptance criteria. The inspector noted that the licensee had not formally established acceptance criteria for the release of the outfall culvert which was grouted in place during the inspection.

In general, the licensee had three different release criteria, one each for building surfaces, embedded piping, and sumps. Licensee representatives and the inspector discussed whether the culvert was considered a structure, embedded piping, or a sump because each had a different release criteria. During performance of the confirmatory survey, the inspector compared the survey results to the building surface release criteria because it was the most conservative of the three criteria. The inspector noted that both the NRC's confirmatory survey results and the licensee's final status survey results were less than the building surface criteria. The licensee issued an Action Request to establish and implement acceptance criteria for the culvert.

2.3 Conclusions

The inspector conducted a confirmatory survey of the outfall culvert, and the survey measurements were less than the acceptance criteria established by the licensee for building surfaces.

The inspector noted and discussed with the licensee a minor discrepancy between how background samples had been collected within the culvert survey unit and the guidance provided in MARSSIM.

The licensee's final survey results for three survey units were reviewed, and the results were generally being documented in accordance with procedural instructions. Minor exceptions where the documentation did not follow instructions were brought to the licensee's attention.

3 Followup (92701)

3.1 (Discussed) Licensee Event Report 050-00206/0509-02: Leaking Sealed Source

On February 23, 2005, the licensee informed the NRC that a 5-curie plutonium-beryllium sealed source was leaking. The leaking source was a 74-gram neutron source, MRC-N-SS-W-PuBe-463 (Monsanto Research Corporation, Neutron source, Stainless Steel container, Welded seal, Plutonium-239/Beryllium isotope, Serial Number 463). Sample results indicate that the amount of removable contamination was 1.35 microcuries with a reporting limit of 0.005 microcuries.

The plutonium-beryllium source was installed in Unit 1 about 1971 for use as a boron analyzer. During August 2004, the licensee attempted to remove the source as part of routine decommissioning, but during removal, the licensee recognized that the source container was cracked. Action Request 040800926 was issued to formulate corrective actions. One completed corrective action was to repackage the source into a new leak-tight aluminum overpack container.

At the end of the inspection period, the source remained in secured storage. The licensee plans to ship the source in a proper Department of Transportation specification package to the Department of Energy/Los Alamos National Laboratory for permanent disposal in the near future. Scheduling of the shipment was controlled by the Department of Energy. Scheduling of the shipment was expected to occur during

November 2005. Following the transfer of the source, the licensee plans to report the material transfer to the NRC in accordance with 10 CFR 74.15 requirements.

4 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the exit meeting on October 27, 2005. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspector.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

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J. Custer, Unit 1 Operations Superintendent
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INSPECTION PROCEDURES USED

71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
83801 Inspection of Final Surveys at Permanently Shutdown Reactors
92701 Followup

ITEMS OPENED AND CLOSED

Opened

None

Closed

None

Discussed

050-00206/0509-02 LER Leaking Sealed Source

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
cpm	counts per minute
DCGL	derived concentration guideline level
dpm/100 cm^2	disintegrations per minute per 100-square centimeters
ISFSI	Independent Spent Fuel Storage Installation
gpm	gallons per minute
LER	Licensee Event Report
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
µR/hr	microRoentgens per hour
ODCM	Offsite Dose Calculation Manual