



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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August 21, 2007

Richard M. Rosenblum
Chief Nuclear Officer
Southern California Edison Company
San Onofre Nuclear Generating Station
P.O. Box 128
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SUBJECT: NRC INSPECTION REPORT 050-00206/07-014

Dear Mr. Rosenblum:

This refers to the inspection conducted on July 23-26, 2007, at Southern California Edison Company's (SCE) San Onofre Nuclear Generating Station (SONGS), Unit 1 facility. This inspection was an examination of decommissioning 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 NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact the undersigned at (817) 860-8191 or Mr. Emilio M. Garcia, Health Physicist, at (530) 756-3910.

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
No.: 050-00206/07-014

Southern California Edison Co.

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No: 050-00206

License No: DPR-13

Report No: 050-00206/07-014

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: July 23 - 26, 2007

Inspectors: Emilio M. Garcia, Health Physicist
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Approved By: D. Blair Spitzberg, Ph.D., Chief
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Attachment: Supplemental Inspection Information

ADAMS Entry: IR05000206-07-014 on 07/23/2007 - 07/26/2007; Southern
California Edison Co., San Onofre Nuclear Generating Station;
Unit 1. Decommissioning Report. No Violations.

Enclosure

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Unit 1 NRC Inspection Report 050-00206/07-014

This inspection was a routine, announced inspection of decommissioning activities being conducted at San Onofre Nuclear Generating Station, Unit 1 facility. Areas inspected included organization, management, and cost controls; safety reviews, design changes and modifications; maintenance and surveillances; decommissioning performance and status review; final surveys; and radioactive waste treatment and environmental monitoring. The inspection determined that the licensee was conducting decommissioning activities in compliance with regulatory and license requirements.

Organization, Management, and Cost Controls at Permanently Shutdown Reactors

- The licensee's organizational structure was consistent with the requirements of the SONGS Unit 1 Technical Specifications. All managerial positions were staffed with experienced individuals (Section 1).

Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors

- The licensee's safety review and design change program was in compliance with 10 CFR 50.59 requirements (Section 2).

Maintenance and Surveillances

- The Unit 1 yard drain sump had been removed from service and the associated radiation monitor had been declared out service. Yard drains in the Unit 1 area now drained into the Unit 2/3 outfall. The Unit 2/3 R2101, North Industrial Area Yard Drain Sump Radiation Monitor, was being maintained by the licensee in accordance with the Offsite Dose Calculation Manual (ODCM) and surveillance procedure requirements (Section 3).

Decommissioning Performance and Status Review at Permanently Shutdown Reactors

- The licensee was controlling the radiologically restricted area in accordance with regulatory requirements. The licensee continued to make progress in decommissioning of the Unit 1 site (Section 4).

Inspections of Final Surveys

- Although radiological-related Comprehensive Ground Record Program documents could be correlated with the grid system in Engineering Drawing U1-C-0037, this correlation was not obvious or easily accomplished. The Comprehensive Ground Record Program documents the radiological condition of the site to support eventual NRC license termination (Section 5).
- The licensee had performed self-assessments and reviews of the SONGS Unit 1 Decommissioning Project Comprehensive Ground Record Program and the

Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) surveys and found that they met the intent of the MARSSIM guidelines (Section 5).

- The licensee had not clearly described the location(s) of background measurements that were used for comparisons with survey unit data. Additional clarifying information regarding the collection of background measurements may be necessary to constitute a defensible Final Status Survey in accordance with the MARSSIM approach. The licensee generated Action Request 070800078-1 to review and address background data collection methods and documentation of background data for MARSSIM surveys. This matter will be discussed with the NRC project manager who will coordinate any review of the licensee's Final Status Survey. (Section 5).

Radioactive Waste Treatment, and Effluent and Environmental Monitoring

- The licensee's programs for monitoring radioactive liquid and gaseous effluent releases and environmental monitoring were in compliance with license requirements. All required samples had been collected, no sample result exceeded applicable limits, and no adverse trends were identified. (Section 6).

Report Details

Summary of Plant Status

San Onofre Nuclear Generating Station (SONGS), 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.

1 Organization, Management, and Cost Controls at Permanently Shutdown Reactors (36801)

a. Inspection Scope

The inspectors reviewed the licensee's organizational structure against the requirements of the SONGS Unit 1 Technical Specifications, the De-fueled Safety Analysis Report (DSAR) and the Topical Quality Assurance Manual (TQAM).

b. Observations and Findings

Section 6.2 of the Technical Specifications requires that the lines of authority, responsibility and communications be established and defined for the highest management levels through intermediate levels to include all organizations. The Technical Specification also requires that a Southern California Edison Company (SCE) Vice President shall be responsible for overall unit safety and that a SCE Vice President shall have corporate responsibility for decommissioning activities.

The July 2006, amendment to the DSAR designated the Senior Vice President as the Chief Nuclear Officer and to whom all levels of the organization report. Previously, this position was designated as the Executive Vice-President. The Senior Vice-President reports to the SCE Chief Executive Officer. The Vice-President of Engineering and Technical Services (VP-E&TS) had responsibility for the decommissioning of Unit 1. The Manager Projects reports to the VP-E&TS and supervises the Manager Unit 1 Decommissioning. The position of Manager Projects was not defined in the DSAR. The DSAR further defined the lines of authority, responsibility and communications through the intermediate levels of all onsite organizations. This organization was consistent with that described in Chapter 1-B of the Topical Quality Assurance Manual, with the exception that the title of Executive Vice-President had not yet been revised to Senior Vice-President, and the Manager Projects was not included in the organization. Two Action Requests (AR) were opened to address these inconsistencies between the actual organization and the TQAM, AR 070701081 and AR 070400851. The Manager, Nuclear Oversight and Assessment, stated that an additional action request would be opened to evaluate why TQAM had not been previously revised to update the Executive Vice-President to Senior Vice-President.

An action item had been added to AR 060700601, to require that changes to the licensee organization and operations were included in the 2008 revision of the DSAR. The licensee maintained an updated Organization Chart to reflect the individuals assigned to each position.

The licensee had evaluated the qualifications and training of individuals assigned to positions designated in the DSAR and had documented that they met the requirements of ANSI N18.1-1971 and NRC Regulatory Guide 1.8.

c. Conclusion

The licensee's organizational structure was consistent with the requirements of the SONGS Unit 1 Technical Specifications. All managerial positions were staffed with experienced individuals.

2 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors (37801)

2.1 Inspection Scope

The inspectors conducted reviews of the licensee's design change to ensure compliance with the requirements of 10 CFR 50.59.

2.2 Observations and Findings

Regulation 10 CFR 50.59 addresses the change control process, a process used by the licensee to determine if a proposed change to the facility, procedures, tests, or experiments is subject to a license amendment and NRC approval. The process is implemented through site procedure SO123-XV-44, "10 CFR 50.59 and 72.48 Program." This procedure provided instructions for both initial screening and subsequent full evaluation, if necessary, of facility or procedure changes to confirm if the licensee can implement these changes without NRC approval. The program was a common program for the two operating units and the decommissioning unit. The initial screens and full evaluations are documented through the computerized Action Request System. This computerized system checks to verify that the individual preparing, reviewing and approving safety screens and full evaluations were current in their training.

During the period of April 1, 2007 to July 23, 2007, no 10 CFR 50.59 safety evaluations were conducted for Unit 1 activities and 9 safety screens related to changes to the facility were created or closed. This area was previously inspected in April 2007. The inspectors reviewed the training records and determined that all preparers and reviewers were current with their training.

2.3 Conclusions

The licensee's safety review and design change program was in compliance with 10 CFR 50.59 requirements.

3. Maintenance and Surveillances (IP 62801)

3.1 Inspection Scope

The inspectors reviewed the status of selected maintenance and surveillance activities to verify if structures, systems, and components were being maintained in compliance with Offsite Dose Calculation Manual (ODCM) and procedural requirements.

3.2 Observations and Findings

The last remaining component associated with the ODCM was the yard sump liquid radiation monitor R-2101. On October 7, 2006, a comparable Unit 2/3 R-2101 liquid radiation monitor was placed in service when the north industrial area yard sump was placed into service. The effluent from the north drain sump drains into the Unit 2/3 outfall. On October 16, 2006, the old Unit 1 yard drain sump was declared out service and the associated radiation monitoring instrument, Unit 1 R2101, was declared permanently inoperable and removed from service. Future effluents from the north yard sump will be accounted under the Unit 2/3 ODCM.

The inspectors verified that the new Unit 2/3 R-2101 instrument had been calibrated, and that routine operability surveillances were being conducted. Surveillances included SO23-3-3.21.1, "Radiation Monitoring and Common Daily Surveillances - All Modes," SO23-3-3.27.3, "Unit 2 and Common Weekly Surveillances - All Modes," and SO23-XXV-4.21, "North Industrial Area Yard Drain Sump Radiation Monitor Loop 2/3R2101 Channel Calibration."

3.3 Conclusions

The Unit 1 yard drain sump had been removed from service and the associated radiation monitor had been declared out service. Yard drains in the Unit 1 area now drained into the Unit 2/3 outfall. The Unit 2/3 R2101, North Industrial Area Yard Drain Sump Radiation Monitor was being maintained by the licensee in accordance with ODCM and surveillance procedure requirements.

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

4.1 Inspection Scope

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

4.2 Observations and Findings

The inspectors 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 controlled and postings were updated as conditions changed in all areas.

As part of the DECON decommissioning process, the licensee conducted radiological surveys of equipment prior to free-release from the site. To verify that the equipment had been properly surveyed by the licensee, the inspectors selected seven items for a confirmatory radiological survey. The confirmatory survey measured beta-particulate radioactivity using an Eberline E-600 count rate meter (NRC No. 079977, calibration due date of 09/15/07) coupled to a SHP380 alpha-beta probe.

The inspectors collected background measurements and calculated a lower limit of detection for the instrument. The inspectors measured the contamination on electrical wire, metal conduit, insulation and metal spray cans. The inspectors also scanned selected equipment with a second survey meter, a Ludlum Model 19 survey meter (NRC No. 015518, calibration due date of 12/11/2007). No radioactive material above background levels was identified.

Just prior to the inspection, the licensee had completed demolition of the last portion of the sphere enclosure building wall. The inspectors observed removal of the demolished concrete and rebar from the site.

4.3 Conclusions

The licensee was controlling the radiologically restricted area in accordance with regulatory requirements. The licensee continued to make progress in decommissioning of the Unit 1 site.

5 Inspections of Final Surveys (IP 83801)

5.1 Inspection Scope

The inspectors reviewed the radiological measurements, and surveys related to final status surveys to verify that they were conducted and documented in accordance with the licensee's procedures and NRC guidance.

5.2 Observations and Findings

Site procedure SO1-XXVIII-6.2.5, "Comprehensive Ground Record Program for SONGS 1 Decommissioning Project," provides guidance for generating, processing, storage, and retrieval of records documenting the radiological and environmental condition of the SONGS 1 site to support future termination of both the NRC license and the site easement agreement. The Comprehensive Ground Record Program addressed records related to: (1) the radiological condition of the site to support eventual NRC license termination; (2) any physical structures that remain on site to support termination of the site easement agreement; and (3) the environmental condition of the site to support applicable release requirements.

Section 6.2.3 of site procedure SO1-XXVIII-6.2.5, "Comprehensive Ground Record Program for SONGS 1 Decommissioning Project," described the use of a standardized coordinate system for records related to the project. The section noted that the ability to recreate location information in Comprehensive Ground Record Program documents is essential to support termination of the NRC license and the site easement agreement. The procedure further stated that a standardized coordinate system is followed by all Comprehensive Ground Record Program documents so that both radiological and environmental data can be correlated with the SONGS 1 Engineering Ground Plot in Engineering Drawing U1-C-0037. Engineering Drawing U1-C-0037 established a grid of the SONGS Unit 1 site, which divided the site into sequentially numbered blocks, from 1 to 269.

The inspectors reviewed SONGS Unit 1 Environmental Survey Record Book No. 1 (Document No. CGR-EP-001-00) and Book No. 2 (Document No. CGR-EP_02-001). These environmental records clearly referenced grid locations that were directly correlated with Engineering Drawing U1-C-0037. The inspectors also reviewed SONGS Unit 1 Health Physics Survey Record Book No. 2-A (Document No. CGR-HP-002-A-00). This document contained records and supporting documentation related to radiological surveys of the turbine building pedestal. This document stated that surveys were performed in accordance with the final status survey guidance found in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NUREG-1575, Rev. 1). The survey record forms in SONGS Unit 1 Health Physics Survey Record Book No. 2-A did not refer to a grid location on Engineering Drawing U1-C-0037 but instead referred to an "Area." The use of the term "Area" was related to the way certain portions of the SONGS Unit 1 site were historically referred to or used by the licensee. For example, Areas 2, 4, 5, 6, and 7 were all related to the turbine building and associated structures. Over the years, certain Areas have been redefined, changed size, and additional Areas have been put in place. These changes have been identified on various licensee engineering documents and drawings. Because the radiological surveys used "Areas" as opposed to grid locations, the inspectors questioned whether the radiological data could be correlated with Engineering Drawing U1-C-0037. The inspectors found that the "Areas" were indeed correlated with the grid locations in Engineering Drawing U1-C-0037. However, correlating the two approaches was challenging and, in the absence of many aboveground identifying structures, required a strong familiarization with the site layout in addition to the use of coordinates (i.e. Westings and Southings) provided by a professional surveyor. This matter was discussed with the licensee.

The licensee had recently begun to revise certain portions of earlier completed SONGS Unit 1 Health Physics Survey Record Books. For example, at the time of the inspection, the licensee was in the process of revising Record Book No. 1, which addressed the SONGS Unit 1 Diesel Generator Building, Administration Building, and Feedwater Heater areas. The document was being revised, in part, because licensee personnel recognized that the original survey results, which were obtained during the 2001 time period, were being stored on magnetic computer tape storage media. It was determined by the licensee that this data might not be retrievable at such a date when the licensee decides to terminate the NRC license. As a result, the historical survey data was being manually entered into the SONGS site-wide Integrated Health Physics System (IHPS). The IHPS system is a maintained system and it was expected that the data would be retrievable for the life of the plant. As the data was entered into IHPS, a revised

radiological survey was generated, which included the individual IHPS record retrieval numbers. In addition, as these radiological survey records were revised, the licensee was making a concerted effort to supplement the "Area" location provided on the surveys with the appropriate corresponding grid locations as noted in Engineering Drawing U1-C-0037.

The licensee had performed self-assessments and reviews of the SONGS Unit 1 Decommissioning Project Comprehensive Ground Record Program and MARSSIM surveys. Specifically, in January 2007, the licensee's Nuclear Oversight and Assessment Division issued a report that provided an assessment of SONGS Unit 1 Decommissioning Project MARSSIM survey program. In the review, the following areas were assessed: planning, historical site assessment, release criteria, instrumentation selection, survey unit classification, final status survey, and documentation. Regarding the review of final status surveys, the documents that were reviewed for the assessment included SONGS Unit 1 Health Physics Survey Record Book No. 2-A "Turbine Building Pedestal Foundation Mat & Embedded Pipe," CGR-HP-002-A-00. The assessment of this and other documents concluded that the documents met the requirements as outlined in MARSSIM. The conclusion of the assessment report was that the SONGS Unit 1 decommissioning survey program met the intent of the MARSSIM guidelines.

During their review of SONGS Unit 1 Health Physics Survey Record Book No. 2-A "Turbine Building Pedestal Foundation Mat & Embedded Pipe," CGR-HP-002-A-00, the inspectors noted that the records did not contain an adequate description of where background measurements were obtained. For example, drawings of the survey units provided locations for direct radiation measurements but provided no indication of where background measurements were obtained. Likewise, the licensee's text and data for the accompanying survey units also did not indicate where background measurements were obtained. Section 4.5 of MARSSIM notes that background reference areas are used to provide a location for background measurements such that they can be used for comparisons with survey unit data. This section of MARSSIM furthermore indicates that background reference areas are normally selected from non-impacted areas. The guidance in MARSSIM recognizes that in some situations, a reference area may be associated with the survey unit being evaluated, but cannot be potentially contaminated by site activities. Although background reference areas generally should not be part of the survey unit being evaluated, it is also recognized that it may be difficult to locate a background reference area that is appropriate for comparison to radiological survey results. MARSSIM provides guidance and techniques for verifying that a particular background reference area is appropriate. The use of these tools would provide greater assurance that the assumptions used in the survey design are defensible.

A review of SONGS Unit 1 Health Physics Survey Record Book No. 2-A indicated that for the Turbine Building Pedestal Foundation Mat & Anchor Block 1, six (6) Class 1 survey units were identified by the licensee, and that for Anchor Block 2, two (2) Class 1 survey units were identified by the licensee. Class 1 survey units are described in MARSSIM as areas that have, or had prior to remediation, a potential for radioactive contamination (based on operating history) or known contamination (based on previous radiological surveys). In SONGS Unit 1 Health Physics Survey Record Book No. 2-A, the licensee's drawings of the radiological survey locations and the accompanying text did not identify the location of background measurements although data for background

measurements were provided. Interviews with licensee staff indicated that typically background measurements were obtained from within the survey units being surveyed. It was not clear whether background measurements were obtained in each survey unit or whether a background measurements had been performed inside of one of the survey units. Because these survey units were categorized as Class 1, this means that background measurements were obtained from known or potentially impacted areas. This apparent departure from MARSSIM guidance regarding background reference areas was discussed with the licensee. In addition, it was noted that this matter had been previously discussed with the licensee and documented in NRC Inspection Report 050-00206/2005-012 dated November 22, 2005 (ADAMS ML053260484). Specifically, it was noted in the subject inspection report that after the matter had been discussed with the licensee, an Action Request was issued by the licensee to review the collection of background measurements. The results of this previous Action Request could not be determined. The need for appropriate and defensible background measurements was again noted during this inspection. During this inspection, the licensee generated Action Request 070800078-1 to review and address background data collection methods and documentation of background data for MARSSIM surveys.

In addition to the results of the licensee's radiological surveys, the SONGS Unit 1 Health Physics Survey Record Book No. 2-A presented the results of confirmatory surveys that were performed by an independent consulting company. These confirmatory surveys were reviewed by the inspectors to determine if any additional information was provided regarding the collection of background measurements. The independent consulting company's report for the Pedestal Foundation Mat & Anchor Block 1 indicated that background measurements were obtained from inside of one of the six survey units. For Anchor Block 2, the independent consulting company's report indicated that the background measurement was obtained just outside of one of the two survey units. It was unclear whether the background locations used by the independent consulting company were the same locations as those used by licensee personnel during their radiological surveys.

5.3 Conclusions

Although radiological-related Comprehensive Ground Record Program documents could be correlated with the grid system in Engineering Drawing U1-C-0037, this correlation was not obvious or easily accomplished. The Comprehensive Ground Record Program documents the radiological condition of the site to support eventual NRC license termination.

The licensee had performed self-assessments and reviews of the SONGS Unit 1 Decommissioning Project Comprehensive Ground Record Program and MARSSIM surveys and found that they met the intent of the MARSSIM guidelines.

The licensee had not clearly described the location(s) of background measurements that were used for comparisons with survey unit data. Additional clarifying information regarding the collection of background measurements may be necessary to constitute a defensible Final Status Survey in accordance with the MARSSIM approach. The licensee generated Action Request 070800078-1 to review and address background data collection methods and documentation of background data for MARSSIM surveys.

This matter will be discussed with the NRC project manager who will coordinate any review of the licensee's Final Status Survey.

6 Radioactive Waste Treatment, and Effluent and Environmental Monitoring (84750)

6.1 Inspection Scope

The inspectors reviewed the licensee's program to control, monitor, and quantify releases of radioactive materials to the environment in liquid, gaseous, and particulate forms.

6.2 Observations and Findings

a. Audits and Appraisals

The inspectors reviewed audit report SCES-008-06, Environmental- ODCM. This audit was conducted between August 29 and September 28, 2006. The individuals that conducted the audit were independent of the areas been audited. This audit identified no issues that were significantly adverse to quality and determined that program compliance was satisfactory. The audit did identify 3 items that were characterized as areas for improvement. The licensee had opened an Action Request to address the areas for improvement. As of July 25, 2007, the work was ongoing on this AR.

b. Effluent Monitoring

Section D6.8.4.a of the Permanently Defueled Technical Specifications states that a radioactive effluent control program shall be established, implemented, and maintained. The methodology used to monitor, sample, and analyze the liquid and gaseous effluents is provided in the SONGS Unit 1 Offsite Dose Calculation Manual (ODCM). The inspectors compared the program requirements specified in the ODCM to the sample results as documented in the licensee's 2006 Annual Radioactive Effluent Release Report (ARERR) dated April 27, 2007. This report was submitted on time and the licensee collected all samples required by the ODCM. No sample result exceeded the applicable reporting level. The last time tritium was identified in groundwater samples was on October 23, 2006. The report concludes that the radioactive releases and resulting doses generated from Unit 1 were below the applicable limits for both gaseous and liquid effluents.

The report states that doses to an individual due to liquid effluents, airborne releases and direct radiation were all a fraction of a millirem and well below the applicable limits. The report notes that the ODCM was revised on February 24, 2006, with Revision 24. This revision incorporated updates from the 2004-2005 Land Use Census. On November 27, 2006, Revision 25 of the ODCM became effective. This revision incorporated the removal of the plant vent stack from service and the removal of the yard drain sump. With these changes the licensee will no longer credit any liquid or airborne effluents releases to Unit 1. Future releases of liquids will be credited to Units 2-3.

The 2006 annual radioactive effluent release report also included solid waste shipment information. During 2006, the licensee shipped solid wastes to disposal sites in Utah, and to a volume reduction service in Utah. The licensee sent 303 shipments by rail and 31 shipments by truck. In addition, 6 shipments went to a volume reduction contractor. The contractor subsequently shipped the compacted wastes to the disposal site in Utah.

c. Environmental Monitoring

Section D6.8.4.b of the Permanently Defueled Technical Specifications states that a radiological environmental monitoring program shall be established, implemented and maintained. Program requirements are contained in the ODCM. The inspectors compared the ODCM requirements with the information provided in the licensee's 2006 radiological environmental operating report dated May 11, 2007. The report "Annual Radiological Environmental Operating Report (AREOR)" was applicable to all three Units and ISFSI). This report was submitted on time and all ODCM required samples had been obtained. No sample result exceeded the applicable regulatory limit.

Ambient radiation levels were measured at 38 locations with calcium sulfate (CaSO₄) thermoluminescent dosimeters (TLDs). The environmental dosimeters were exchanged quarterly. During 2006, the average routine indicator location dose was 17.03 millirem with a range of 10.42 to 34.84 millirem. The average control location dose was 15.70 millirem with a range of 11.99 to 21.08 millirem. The report concluded that statistically, the control and indicator doses were equivalent. The results suggests that plant operation had no impact on the environment as measured by this sample medium.

Air particulate samples were collected on a weekly basis from eight indicator locations and from one control location. The samples were analyzed for gross beta activity, I-131, and composited quarterly for gamma isotopic analysis. Per the requirements of ODCM, the licensee evaluated the gross beta activity of the indicators to the control locations. The indicator location's maximum gross beta activity in air in 2006 was 0.0515 picocuries per cubic meter and the 2005 control location average was 0.0231 picocuries per cubic meter. No indicator location value exceeded ten times the annual average gross beta activity of the control location data from the previous year. All iodine-131 sample results were below the lower limit of detection. Quarterly composite gamma spectral analysis analyses identified only naturally occurring beryllium-7 (Be-7).

The licensee collected monthly ocean water samples from locations in the vicinity of each station discharge and from the control location. The samples were analyzed for naturally-occurring and licensee-related radionuclides. Quarterly composite ocean water samples were analyzed for tritium. Naturally occurring potassium-40 (K-40) was detected in all ocean water samples obtained in 2006. No licensee-related radionuclides were detected in ocean water samples during 2006. The data indicate that the operation of SONGS had no impact on the environment as measured by this sample medium.

Drinking water samples were collected on a monthly basis from one indicator location and from a control location. Samples were analyzed for tritium, gross beta, and 26 naturally-occurring and licensee-related radionuclides. No station-related radionuclides were detected in drinking water during 2006.

Fish, crustacea and mollusks, were collected on a semi-annual basis at the SONGS Unit I outfall and from a control location. The flesh portion of each sample type was analyzed for 26 station-related and naturally-occurring radionuclides. Naturally-occurring K-40 was detected in most marine samples collected during 2006. No plant-related isotopes were reported above the minimum detectable concentration. Approximately 5% (5 samples) of the 2006 samples collected had detectable plant related radionuclides. Cesium-137 was detected in three soil and sediment samples and iodine-131 in two kelp samples. The cesium-137 may be attributable to residual fallout from nuclear testing and iodine-131 from medical administrations.

In summary, the licensee concluded that the radiological environmental impact of the operation of SONGS through 2006 was negligible, and the resulting dose to man was negligible. The inspectors found that the sample results supported this conclusion. Further, no adverse trends were identified.

6.3 Conclusions

The licensee's programs for monitoring radioactive liquid and gaseous effluent releases and environmental monitoring were in compliance with license requirements. All required samples had been collected, no sample result exceeded applicable limits, and no adverse trends were identified.

7 **Exit Meeting Summary**

The inspectors presented the preliminary inspection results to members of licensee management at the exit meeting on July 26, 2007. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Brieg, Station Manager
J. Carey, Supervisor Health Physics Unit 1
J. Custer, Operations
S. Enright, Unit 1 Health Physics Manager
N. Hansen, Technical Specialist, Environmental
M. Johnson, Manager Environmental
S. Jones, Health Physics Unit 1
L. Kelly, Engineer, Nuclear Regulatory Affairs
C. McAndrews, Manager, Nuclear Oversight and Assessment
M. McBrearty, Nuclear Regulatory Affairs
A. Scherer, Manager Nuclear Regulatory Affairs

INSPECTION PROCEDURES USED

IP 36801	Organization, Management and Cost Controls
IP 37801	Safety Reviews, Design Changes, and Modifications
IP 62801	Maintenance and Surveillances
IP 71801	Decommissioning Performance and Status Review
IP 83801	Inspections of Final Surveys
IP 84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring

ITEMS OPENED AND CLOSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

AR	Action Request
AREOR	Annual Radiological Environmental Operating Report
ARERR	Annual Radioactive Effluent Release Report
CFR	Code of Federal Regulations
DSAR	De-fueled Safety Analysis Report
IHPS	Integrated Health Physics System
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	Minimum Detectable Concentration
ODCM	Offsite Dose Calculation Manual
REMP	Radiological Environmental Monitoring Program
SCE	Southern California Edison Company
SONGS	San Onofre Nuclear Generating Station
TLDs	Thermoluminescent Dosimeters
TQAM	Topical Quality Assurance Manual
VP-E&TS	Vice-President of Engineering and Technical Services