ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION REGION IV

Docket Nos.:	50-361 50-362
License Nos.:	NPF-10 NPF-15
Report No.:	50-361/98-11 50-362/98-11
Licensee:	Southern California Edison Co.
Facility:	San Onofre Nuclear Generating Station, Units 2 and 3
Location:	5000 S. Pacific Coast Hwy. San Clemente, California
Dates:	July 20-24, 1998
Inspector(s):	Larry Ricketson, P.E., Senior Radiation Specialist Plant Support Branch
Approved By:	Blaine Murray, Chief, Plant Support Branch Division of Reactor Safety
Attachment:	Supplemental Information

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EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Units 2 and 3 NRC Inspection Report 50-361/98-11; 50-362/98-11

A routine, announced inspection was performed. The inspection focused on exposure controls, controls of radioactive materials and contamination, surveying and monitoring, and quality assurance oversight of the radiation protection program.

Plant Support

- Radiation exposure controls were very good. High radiation areas were controlled effectively and radiation workers were well briefed on radiological hazards. Radiation protection technicians provided good oversight of work activities (Section R1.1).
- A good calibration program was maintained for radiation protection instruments (Section R1.2).
- Although radioactive materials had apparently not gotten off of the licensee's property, the unplanned movement of contaminated items from the radiological controlled area to the restricted area on numerous occasions and an isolated example of radioactive material found outside the restricted area indicated that improvements were needed in radioactive material controls (Section R1.2).
- Management oversight of the radiation protection program through the Nuclear Oversight Division audit and observations was good. The radiation protection self-assessment program was very active and provided good event trending information to management (Section R7).

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Exposure Controls

a. Inspection Scope (83750)

The inspector interviewed radiation protection personnel and reviewed the following:

- Radiological controlled area access controls
- Control of high radiation areas
- High radiation area key control
- Radiological posting
- Radiation work permits
- Radiation protection job coverage
- Dosimetry use
- Dosimetry processing
- Respiratory protection

b. Observations and Findings (83750)

During tours of the radiological controlled area, the inspector observed that high radiation areas were properly controlled. For the period reviewed (January 1, 1997, to July 20, 1998), no radiological occurrence reports had been initiated to document high radiation area problems. The inspector's independent radiological measurements confirmed that radiological areas were correctly posted. The inspector confirmed that high radiation area keys were inventoried as required, and radiation protection personnel accounted for all keys.

All individuals who entered the radiological controlled area received printed information concerning radiological conditions in their work areas, dose limitations, and protective measures during the access control computer log-in process. To address previous NRC concerns, the licensee reformatted and increased the information provided in this manner so that the worker could use printed information as a reference. The radiation protection personnel at the access control point were knowledgeable of plant radiological conditions and routinely questioned workers about the purpose of their visits to the radiological controlled area and discussed with them the radiological conditions.

The inspector attended prejob discussions between radiation protection personnel and maintenance personnel and observed radiation protection oversight of minor work activities within the radiological controlled area. The inspector noted that the radiation protection technician provided proper instruction to radiation workers to minimize radiation exposure and conducted radiation surveys appropriately to prevent the potential spread of radioactive contamination.

All observed radiation workers wore dosimetry devices appropriately.

Thermoluminescent dosimeters were processed by the licensee, except those used for monitoring neutron dose. A vendor service provided neutron monitoring devices. The licensee's dosimetry program was evaluated by the National Voluntary Laboratory Accreditation Program in May 1998. No deficiencies were identified. The licensee's facility was accredited in all categories except Category VIII, which involved the measurement of neutron dose. The vendor supplying neutron dosimeters was accredited by the National Voluntary Laboratory Accreditation Program.

c. Conclusions

Radiation exposure controls were very good. High radiation areas were controlled effectively, and radiation workers were well briefed on radiological hazards. Radiation protection technicians provided good oversight of work activities.

R1.2 Control of Radioactive Material and Contamination; Surveying and Monitoring

a. Inspection Scope (83750)

The inspector interviewed radiation protection personnel and reviewed the following:

- Radioactive contamination controls
- Radioactive source accountability
- Source leak testing
- Personnel contamination events
- Portable survey instrument calibration
- Personnel contamination monitors and tool monitor calibration
- Alarming dosimeters/pocket ion chambers calibration
- Whole-body counter calibration

b. Observations and Findings

During Inspection 50-361/96-19; 50-362/96-19, the inspector identified a violation of procedural requirements because there were multiple examples in which licensee personnel failed to perform radiological surveys that were adequate to identify radioactive material and prevent the material from leaving the radiological controlled area or radioactive materials areas. The radioactive material was found outside the radiological controlled area, but within the restricted area. Since that time, the licensee implemented corrective actions and revised procedural requirements. However, licensee representatives continued to identify contaminated items that were allowed outside the radiological controlled area and into the protected or restricted area. Although these examples were no longer procedural violations, the inspector expressed a concern that the occurrences indicated that the licensee's radioactive materials controls were vulnerable, since essentially the same controls were used to prevent the release of radioactive material from the restricted area as were used to prevent the release from the radiological controlled area. Radioactive material was controlled primarily by the use of radiation monitors at personnel exits or physical radiation surveys performed by radiation protection personnel.

On April 6, 1998, an occurrence was identified that supported the inspector's concern. Two waste gas sample pumps with internal contamination were found by the licensee at the South Services Repair Center. Licensee personnel determined that the pumps were removed from the radiological controlled area on February 26, 1998. According to licensee personnel, the contaminated pumps were surveyed in a cabinet radiation monitor before they were released from the restricted area, but the survey did not identify the presence of internal contamination. The pumps were stored in an unrestricted area in the South Services Repair Center until April 3, 1998. On April 3, the pumps were taken to a restricted area in the South Services Repair Center for disassembly. Licensee maintenance personnel asked that radiation control personnel survey the pumps upon disassembly. When the pumps were disassembled, radiation surveys identified the presence of radioactive contamination. The pump diaphragms were found to be contaminated with removable contamination levels of up to 20,000 beta/gamma disintegrations per minute (dpm)/100 cm² on one pump; 5000 dpm/100 cm² on the other. Although the contaminated items were still on the licensee's property. they were not within a designated, restricted area from February 26 to April 3, 1998, and, therefore, were not subject to the usual radioactive materials controls.

Even though a survey of the pumps was performed on February 26, 1998, it was not adequate to identify the presence of internal contamination and evaluate the potential hazard. Therefore, it was a violation of 10 CFR 20.1501(a). 10 CFR 20.1501(a) requires that each licensee make or cause to be made, surveys that may be necessary for the licensee to comply with the regulations in 10 CFR Part 20 and are reasonable under the circumstances to evaluate the extent of radiation levels; and the concentrations or quantities of radioactive material; and the potential radiological hazards that could be present. The licensee failed to perform surveys adequate to ensure compliance with 10 CFR 20.1201, "Occupational Dose Limits for Adults"; 10 CFR 20.1302, "Compliance with Dose Limits for Individual Members of the Public"; 10 CFR 20.1802, "Control of Material Not in Storage"; and 10 CFR 20.2001, "Waste Disposal." However, because it was an isolated example; the total radioactivity involved was low; the pumps did not leave the licensee's property; and radioactive contamination was not exposed in an unrestricted area; this failure constitutes a violation of minor significance and is not subject to formal enforcement action.

Licensee representatives stated that they had been continually focused on corrective actions to prevent the loss of control of radioactive material. They furnished a time line depicting corrective actions taken since Inspection 50-361/96-19; 50-362/96-19. The inspector reviewed the time line and confirmed the licensee's statements but concluded that continued management attention to radioactive materials controls was warranted.

As an independent check of the licensee's corrective actions, the inspector accompanied a radiation protection technician who surveyed the maintenance building (K10), clean tool crib, and shop area. No contaminated tools or items were identified. At the request of the inspector, the technician also conducted surveys of several trash dumpsters. No items with radioactive materials were identified in these containers.

While reviewing a different part of the licensee's material control program, the inspector randomly selected source identification numbers from the licensee's source inventory

and with the aid of a radiation protection representative confirmed the radioactive sources were stored as indicated on the inventory.

The radiation protection organization was responsible for the calibration of portable radiation detection instruments, small article monitors, and personnel contamination monitors. The inspector obtained portable radiation detection instrument identification numbers at random from the licensee's radiation survey records and checked the calibration dates of the instruments. The inspector determined that ail radiation survey instruments selected were within the allowable calibration interval at the time of use. The inspector visited the licensee's portable instrument calibration facility and noted that calibration equipment common to the industry was used. The licensee performed the majority of repairs on portable radiation detection instruments and, after reviewing the licensee's facilities and spare parts inventory, the inspector concluded that the resources devoted to this activity were noteworthy. Through observation and personnel interviews, the inspector determined the licensee had an adequate supply of operable radiation detection instruments.

The licensee periodically sent neutron detection instruments to a vendor for calibration with a moderated californium-252 source. Between these calibrations, the licensee used a plutonium-beryllium source to ensure the instruments responded consistently. The inspector concluded that this was an acceptable means of maintaining properly functioning instrumentation.

A vendor performed the calibration of the whole-body counter at the licensee's personnel processing facility. Licensee personnel performed annual calibrations of the two whole-body counters within the protected area. All whole-body counters were within their allowable calibration intervals.

c. Conclusions

A good calibration program was maintained for radiation protection instruments. Resources devoted to the repair and maintenance of radiation detection instruments were noteworthy.

Although radioactive materials had apparently not gotten off of the licensee's property, the unplanned movement of contaminated items from the radiological controlled area to the restricted area on numerous occasions and an isolated example of radioactive material found outside the restricted area indicated that improvements were needed in radioactive material controls.

R7 Quality Assurance in Radiation Protection & Chemistry Activities

a. Inspection Scope

The inspector reviewed the following:

- Quality Performance Assessment Reports
- Audit Checklists
- Action Requests

b. Observations and Findings

Quality Assurance Audit Report SCES-706-97 was performed October 3 through December 12, 1997. The audit focused on aspects of the radiation protection program. A representative of the Nuclear Oversight Division showed the inspector a copy of the master audit plan. The master audit plan indicated the areas reviewed. The Nuclear Oversight Division representative stated that another audit was planned for late 1998 to cover the remaining radiation protection program areas. The inspector concluded that the Nuclear Oversight Division's review of the radiation protection program would be comprehensive if completed as described.

The audit team was composed of a Nuclear Oversight Division auditor and a technical specialist from the radiation protection organization. The Nuclear Oversight Division representative stated that it was the licensee's intent to include a technical representative from another nuclear power generation site on the next audit team.

The audit team found radiation protection performance satisfactory. The radiation protection audit produced two problem review reports and identified six improvement opportunities. The items were tracked by the licensee's action tracking system. The radiation protection organization responded to the items promptly and implemented corrective actions or enhancements, as appropriate.

The Nuclear Oversight Division conducted an active observation (surveillance) program. Based on observation records, observations of radiation protection activities were conducted frequently. The inspector concluded that the observations provided management with a good knowledge of day-to-day performance by the radiation protection organization and radiation workers.

The radiation protection organization continued to be very active in performing self-assessments and field observations. A list of assessments performed or planned confirmed that assessment coverage of the radiation protection program was comprehensive. Causal analyses were performed on adverse events, and the results were trended and reported to management on a quarterly basis. Assessment findings were dispositioned through the action request system. The radiation protection organization processed the action requests in a timely manner.

c. Conclusions

Management oversight of the radiation protection program through the Nuclear Oversight Division audit and observations was good. The radiation protection self-assessment program was very active and provided good event trending information to management.

R8 Miscellaneous Radiation Protection & Chemistry Issues

8.1 (Closed) Violation 50-362; 50-362/9619-01: Worker awareness of radiological conditions

The inspector verified the corrective actions described in the licensee's response letter, dated August 18, 1997, were implemented. No similar problems were identified.

8.2 (Closed) Violation 50-362; 50-362/9619-03: Failure to label containers of radioactive material

The inspector verified the corrective actions described in the licensee's response letter, dated August 18, 1997, were implemented. No similar problems were identified.

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at an exit meeting on July 24, 1998. The licensee acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

Supplemental Information

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Barrow, Supervisor, Health Physics Operations

E. Bennet, Nuclear Auditor

J. Madigan, Health Physics Manager

S. Mahler, Compliance Engineer

D. Nunn, Vice President, Engineering and Technical Services

J. Rolph, Supervisor, Health Physics Instrumentation/Dosimetry

A. Scherer, Manager, Nuclear Regulatory Affairs

S. Schofield, Health Physics Supervisor

K. Slagle, Manager, Nuclear Oversight

NRC

John Russell, Resident Inspector

INSPECTION PROCEDURES USED

83750 Occupational Radiation Exposure

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

50-361;362/9619-01 VIO Worker awareness of radiological conditions

50-361;362/9619-03 VIO Failure to label containers of radioactive material

Discussed

None

LIST OF DOCUMENTS REVIEWED

SCE Quality Assurance Audit Report SCES-706-97, "Health Physics/Radiation Protection Program Audit (December 18, 1997)"

Procedures

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SO123-VII-4.3.21	Dosimetry Performance Testing, Revision 10
SO123-VII-8	Control of Radioactive Material, Revision 7
SO123-VII-9.1.2	Receipt, Inventory, and Leak Testing of Sealed Radioactive Sources, Revision 13
SO123-VII-20.9	Radiological Surveys Revision 3
SO123-VII-20.9.2	Material Release Surveys, Revision 1
SO123-VII-20.9.4	Survey and Release of Personnel, Revision 1
SO123-VII-20.13.8	Radiological Respirator Inventory, Control, and Issue, Revision 3
SO123-VII-20.14.1	Health Physics Instrumentation Program, Revision 0
Miscellaneous	

SONGS Material Release Event Data