

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-206/94-06
50-361/94-06
50-362/94-06

Licenses: DPR-13
NPF-10
NPF-15

Licensee: Southern California Edison Company
Irvine Operations Center
23 Parker Street
Irvine, California 92718

Facility Name: San Onofre Nuclear Generating Station

Inspection At: San Onofre Site and the Irvine Operations Center
San Diego County, California

Inspection Conducted: March 21-25, 1994

Inspectors: L. C. Carson II, Radiation Specialist
L. T. Ricketson, P.E., Senior Radiation Specialist

Approved:

Blaine Murray
Blaine Murray, Facilities Inspection Program Branch

5/4/94
Date

Inspection Summary

Areas Inspected: Routine, announced inspection of the Radiological Environmental Monitoring Program, including audits and appraisals, changes, program implementation, meteorological monitoring program, internal quality assurance, and training and qualifications.

Results:

- The quality assurance audits of the Radiological Environmental Monitoring Program and the Meteorological Program were sufficient to ensure that the program functioned correctly. The vendor laboratory was appropriately audited as well (Section 1.1).
- Sufficient staffing was allotted to meet program goals (Section 1.3).
- The Radiological Environmental Monitoring Program was effectively implemented (Section 1.3).

- No radiological environmental sample results were above reporting limits (Section 1.3).
- The land use census was properly conducted (Section 1.3).
- The vendor laboratory participated in an interlaboratory comparison program, as required, with good results (Section 1.3).
- The meteorological instrumentation was operable and properly maintained and calibrated (Section 1.4).
- An Unresolved Item was identified involving the contamination of the nitrogen system (Section 2.0).

Summary of Inspection Findings:

- Unresolved Item 361/9406-01; 362/9406-01 was opened (Section 2.0).

Attachment:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 **RADIOLOGICAL ENVIRONMENTAL MONITORING (84750)**

The licensee's program was inspected to determine compliance with Technical Specifications (TSs) 3.3.3.4, 4.3.3.4, 6.5.2.8, 6.8.1, 6.9.1.3, 6.14, and the requirements of 10 CFR Part 20, and agreement with the commitments in the Updated Final Safety Analysis Report (UFSAR) and the recommendations of Regulatory Guides (RGs) 1.23 and 4.15.

1.1 Audits and Appraisals

The inspectors reviewed the following quality assurance audits and surveillances performed on the Radiological Environmental Monitoring Program (REMP):

- Nuclear Utility Procurement Issues Committee (NUPIC) Audit of TMA/NORCAL, conducted November 1992
- QA Audit SCES-537-92, conducted August 1992
- Quality Assurance (QA) Surveillance Report (SR) SOS-010
- QASR SOS-204-92
- QASR SOS-205-92
- QASR SOS-256-92
- QASR SOS-276-92
- QASR SOS-043-93

The inspectors reviewed an audit of the contract laboratory, which performed the radiological analysis of samples taken in support of the REMF. The NUPIC audit that was performed on TMA/NORCAL included a SONGS quality assurance auditor as part of the audit team. The audit was performed November 10-12, 1992, and also included a technical expert as part of the audit team. The results of the audit confirmed that the contract laboratory followed the guidance set forth in RG 4.15.

The inspectors reviewed the following QA audits and surveillances performed on the Meteorological Monitoring Program:

QA Audit SCES-411-94, which was in progress at the time of this inspection.

- QASR SOS-007-92
- QASR SOS-230-92
- QASR SOS-109-93
- QASR SOS-162-93

The audits were comprehensive and included recommendations for program improvement. Responses to findings were made by program personnel in a timely manner.

1.2 Changes to the REMP and Meteorological Program

There were no major changes to organization, equipment, facilities, equipment, programs, or procedures related to the REMP and Meteorological Program since the previous inspection of this area.

1.3 Implementation of the Radiological Environment Monitoring Program

The REMP was implemented, in part, by Site Support Services personnel (Environmental Protection Group), who were responsible for the collection of terrestrial radiological environmental samples. Marine samples were collected by a contractor. The samples were analyzed by a vendor laboratory. The analyses results were evaluated by members of the Health Physics and Environmental Group. The inspectors determined that the staffing was appropriate to meet the program goals.

The inspectors reviewed the 1992 Annual Radiological Environmental Operating Report (AREOR) and discussed with licensee representatives the upcoming 1993 report and determined that the REMP was implemented as described in the Offsite Dose Calculation Manual (ODCM) and that no anomalous sampling results were identified. The inspectors visited selected sampling locations to observe licensee personnel collecting and processing samples. The inspectors determined that this portion of the program was properly conducted.

The inspectors reviewed the 1993 Land Use Census and determined that the licensee had appropriately assessed the land use around the facility and documented significant changes. The licensee used the results of the 1992 Land Use Census to implement necessary changes to the Offsite Dose Calculation Manual.

The vendor laboratory responsible for analyzing the licensee's samples participated in the Environmental Protection Agency's laboratory intercomparison program. Results of the comparison were reviewed by Health Physics and Environmental Group, and included in the AREOR as required. The vendor laboratory achieved satisfactory agreement. The licensee had not proceduralized the acceptance criteria the vendor laboratory had to meet;

however, the licensee had informal criteria by which to judge the vendor's performance.

1.4 Implementation of the Meteorological Monitoring Program

TS 3.3.3.4 requires instrumentation for determining wind speed, wind direction, air temperature, and temperature difference. The inspectors, instrumentation and controls technicians, and the meteorological instrumentation system engineer toured and observed the operation of meteorological instrumentation system at the 40-meter primary and 10-meter backup meteorological instrumentation towers. The system engineer demonstrated the meteorological instrumentation systems operability at the meteorological instrumentation towers and the inspectors confirmed that the instrumentation measured the required parameters. The inspectors verified that meteorological information was available in the control room via computer terminal and strip charts and confirmed that the meteorological instrumentation system was checked daily.

TS 4.3.3.4 requires that instrumentation be calibrated semiannually. Through a records review, the inspectors confirmed that calibrations of the primary and secondary meteorological instruments had been performed at the required frequency. Instruments were calibrated to accuracy tolerances recommended in RG 1.23. The primary and backup meteorological instrumentation tower surveillance test and calibrations were performed in accordance with the following procedures:

- S023-II-8.12, "Surveillance Requirement, Combined 10 and 40 Meter Meteorological Instrumentation Channel Calibration," Revision 6
- S023-II-8.12.1, "10 Meter Backup Meteorological Instrumentation Calibration," Revision 0

The inspectors also noted that the licensee maintained an independently operating meteorological tower at the Emergency Operations Facility. The instrumentation was calibrated at the same frequency as the instrumentation required by the TSs.

The licensee had dual recording systems, digital and analog. The meteorological data was reviewed monthly by a staff meteorologist and a contract meteorologist who determined if replacement data was necessary. The inspectors confirmed that the licensee exceeded 90 percent data recovery, in compliance with its commitment to follow the guidance of RG 1.23.

In interviews with the inspectors, licensee personnel characterized the recent operational history of the meteorological instrumentation by saying that there had been an increasing number of problems because of the age of the instruments and the fact that replacement parts were hard to obtain. To address this problem, the licensee initiated a design change package which will result in the installation of new meteorological sensors. Licensee representatives stated that the design package was tentatively scheduled for completion by the end of 1994.

1.5 Training and Qualifications.

The inspectors reviewed training and qualifications of selected individuals involved in the REMP and determined that they met qualification requirements.

1.6 Conclusions

The QA audits of this area were in sufficient depth to ensure that the program functioned correctly. The vendor laboratory was appropriately audited as well.

Sufficient staffing was provided to meet program goals. The REMP was as described in the ODCM and was effectively implemented. There were no sample results above reporting limits, and the land use census did not indicate a need for significant change in the program. The vendor laboratory participated in an interlaboratory comparison program, as required, with satisfactory results.

The meteorological instrumentation was operable and properly maintained and calibrated. The instrumentation measured the appropriate parameters with the required accuracy. Data recovery percentage was in accordance with established guidelines.

2 **CHANGES IN RADWASTE OPERATIONS, STORAGE, AND DESIGN**

2.1 Contamination of the Nitrogen System by Waste Gas System Backleakage and the Resulting Operational Changes

2.1.1 Background/History

The licensee's investigation of a possible Unit-3 steam generator (SG) primary to secondary leak in February 1994, revealed that the nitrogen system had been contaminated by waste gas system (WGS) backleakage. The licensee was aware of the nitrogen system backleakage pathway because the condenser air ejector (CAE) radiation monitor 3-7870 detected WGS leakage. On February 10, 1994, the inspector asked the licensee the following questions:

- Was a 10 CFR 50.59 Safety Evaluation performed on the nitrogen system, since it was being operated as a contaminated system, contrary to normal operations and contrary to design?
- Was the licensee aware of the provisions of NRC Inspection and Enforcement Bulletin (IEB) 80-10, "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment"?

The licensee stated that a 10 CFR 50.59 Safety Evaluation did not apply, and they were unaware of the provisions of NRC IEB 80-10. The licensee, subsequently, wrote Site Problem Report (SPR) 940068 to investigate the WGS backleakage and nitrogen system contamination problems.

2.1.2 Regulatory Guidance and Licensee Requirements

10 CFR 50.59 and 10 CFR 50.71 e.(3)(i) requires, in part, that the licensee shall maintain records of changes to the facility or procedures described in the UFSAR, including a written safety evaluation that provides the basis for determining that the change does not involve an unreviewed safety question.

UFSAR Section 9.3.2.2.2.6, "Gas Analyzer," describes that a continuous gas analyzer alarms on high level explosive mixture, and on a high-high level automatically injects nitrogen to the surge tank to dilute the explosive mixture.

UFSAR Section 11.3.1.6, "Hydrogen Control," describes that if a potentially explosive mixture starts to develop, the operator would manually inject nitrogen into the WGS for dilution and purging. Also, the continuous hydrogen and oxygen analyzers initiate alarms and initiates automatic nitrogen dilution of the WGS surge tank.

NRC IE Bulletin 80-10 (IEB) and Information Notice (IN) 91-40, "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment," requests operating licensees to take several actions. Specific actions are designated for situations in which nonradioactive systems become radioactively contaminated:

- Use of the system must be restricted until the cause of contamination is identified and corrected, and the system decontaminated.
- If continued operation is necessary with the system contaminated, a safety evaluation must be performed per 10 CFR 50.59.
- If the evaluation concludes that the system may be operated as a radioactive system, any potential releases must be controlled and maintained to the levels addressed in 10 CFR 50, Appendix I.
- Establish a routine sampling/analysis or monitoring program for this systems in order to promptly identify any contamination events.

2.1.3 Licensee's Preliminary Findings

At the time of this inspection, the licensee had not completed its investigation of the backleakage problem. SPR 940068 had resulted in several other related initiatives by the licensee, which included an abnormal WGS to nitrogen system alignment procedure, a sampling and monitoring program, and a Division Investigation Report (DIR). The DIR will evaluate all relevant root cause and corrective action circumstances associated with this backleakage problem. The DIR, also, will determine if a 10 CFR 50.59 evaluation should

have been conducted in February 1994 or April 1989. The licensee's preliminary investigation revealed the following:

- The licensee had conservatively calculated the amount of unplanned and unmonitored radioactivity released was 0.024 Curies noble gases, which resulted in an offsite dose to members of the public of less than 0.01 millirem.
- The recent nitrogen system contamination was confined to the main header between the WGS decay tanks and the Unit 3 condenser. The maximum radioactivity concentration measured were noble gases, $7.5E-4$ microCuries/cubic centimeter (mCi/cc).
- The backleakage from WGS tanks caused the nitrogen system header to see 300 pounds/square inch (psig) instead of the normal 90 psig.
- WGS isolation valves and check valves had failed to prevent the contamination of the nitrogen system, which was contrary to their written responses to the NRC IEB 80-10 and their internal response to IN 91-40.
- In April 1989 a similar nitrogen contamination incident was reported in the Semi-Annual Effluent Radiological Report as a unplanned, but monitored release through the CAE radiation monitor. However, the report described that WGS backleakage via the nitrogen system caused unplanned and unmonitored radioactive effluent releases through other non-radioactive systems.
- Since 1983, the licensee has operated the WGS and nitrogen system purge manually, and may have defeated the automatic purge requirements that were intended in TS 3.3.3.9, TS 3.11.2.5, UFSAR 9.3.2.2.2.6, and UFSAR 11.3.1.6.

The licensee stated that they plan to complete the DIR by May 24, 1994.

2.1.4 Inspector's Findings

The inspector determined that the licensee had implemented some of the provisions of IEB 80-10 and IN 91-40. However, the licensee, had not specifically, performed a 10 CFR 50.59 Safety Evaluation on continuing the operation of the nitrogen system as contaminated system. The licensee performed the following 10 CFR 50.59 Safety Evaluations for changing WGS and nitrogen system operating procedures:

- In September 1993, Procedure S023-8-14, "Radwaste Gas Collection System Operation," added instructions for verifying that the WGS is not leaking into the nitrogen system, and thus preventing unplanned gaseous effluent releases.
- In February 1994 after determining that the WGS still leaked into the nitrogen system, Procedure S0123-0-23, "Abnormal Alignments - WGS Tank

Nitrogen Supply" was written to allow the WGS surge tank solenoid valve HV-7240 remain normally open in order to bleed WGS header pressure away from the nitrogen system.

On March 23, 1994, the licensee sampled the nitrogen system to demonstrate that the WGS backleakage had ceased based on the use of procedure S0123-0-23. The inspector reviewed the results of the licensee's sample analysis, and concluded that no radioactivity was in the nitrogen system.

The inspector determined that specific concerns existed other than the issues identified in IEB 80-10. The inspector noted the following:

- WGS and nitrogen system was not operated as described in the UFSAR, TSs, and design based documents.
- The licensee identified in 1989 that the WGS check valves and isolation valves were not preventing WGS backleakage, yet no permanent corrective action was taken.
- Cross-disciplinary reviews between the various departments (i.e. Operations, Engineering, Chemistry, Health Physics, Technical Support, and Licensing) had not integrated to resolve this matter.

IEB 80-10 states, in part, that if it is considered necessary to continue operations of the system as contaminated, an immediate safety evaluation must be performed in accordance with the requirements of 10 CFR 50.59. The inspector informed the licensee that a final decision concerning the 10 CFR 50.59 issue will be delayed pending completion of the DIR. This matter is considered an Unresolved Item pending further review of the licensee's investigation (361/9406-01; 362/9406-01). An unresolved item is a matter about which more information is required to ascertain whether it is an acceptable item, a violation, or a deviation.

2.1.5 Conclusions

An unresolved item was identified involving the lack of a 10 CFR 50.59 safety review of the circumstances surrounding the waste gas system contaminating the nitrogen system.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

- C. Brazley, Technician, Instrumentation and Controls
- *D. Breig, Manager, Station Technical
- *P. Chang, Supervisor, Effluents Engineer
- *J. Clark, Manager, Chemistry
- *J. Darling, Engineer, Onsite Nuclear Licensing
- *M. Farr, Engineer, Onsite Nuclear Licensing
- *G. Gibson, Supervisor, Onsite Nuclear Licensing
- *M. Goeders, Engineer, Health Physics and Environmental
- *E. Goldin, Supervisor, Health Physics and Environmental
- *M. Gratzl, General Foreman, Instrumentation and Controls
- A. Hammons, Site Quality Assurance
- *M. Herschthal, Manager, Nuclear Safety Engineering
- *D. Irvine, Supervisor, Technical Support
- *M. Johnson, Supervisor, Environmental Protection Group
- *B. Katz, Manager, Nuclear Safety
- *P. Knapp, Manager, Health Physics
- S. Marsh, Senior Research Engineer, Meteorologist, SCE Environmental Affairs
- L. Matloch, Air Quality Specialist, Environmental Protection Group
- B. D. Metz, Supervisor, Environmental Services
- D. Morales, Site Quality Assurance
- *L. Pentecost, Supervising Engineer, Site Technical Services
- *S. Paranandi, Supervisor, Site Quality Assurance
- *R. L. Sanders, Cognizant Engineer, Meteorological Instrumentation
- H. Wood, Site Quality Assurance
- *L. Wright, Supervisor, Performance Monitoring & Reliability Engineering
- *R. Waldo, Operations Manager

1.2 NRC Personnel

- *D. Solorio, Resident Inspector

*Denotes personnel that attended the exit meeting. In addition to the personnel listed, the inspectors contacted other personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on March 25, 1994. During this meeting, the inspectors reviewed the scope and findings of the report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary, any information provided to, or reviewed by the inspectors.