

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-206/85-10, 50-361/85-10 and 50-362/85-09  
Docket Nos. 50-206, 50-361 and 50-362  
License Nos. DPR-13, NPF-10 and NPF-15  
Licensee: Southern California Edison Company  
2244 Walnut Grove Avenue  
Rosemead, California 91770  
Facility Name: San Onofre Nuclear Generating Station Units 1, 2 and 3  
Inspection at: San Onofre Nuclear Generating Station  
Inspection conducted: March 25-28, April 1-5 and 15-16, 1985

Inspector:

H. S. North  
H. S. North, Senior Radiation Specialist

5/9/85  
Date Signed

Approved By:

G. P. Yuhas  
G. P. Yuhas, Chief  
Facilities Radiological Protection Section

5/10/85  
Date Signed

Summary:

Inspection on March 25-28, April 1-5 and 15-16, 1985  
(Report Nos. 50-206/85-10, 50-361/85-10 and 50-362/85-09)

Areas Inspected: Routine, unannounced inspection of licensee action on previous inspection findings, review of licensee reports, allegation followup, radiation protection, chemistry and radwaste management controls and control of radioactive materials and contamination, ALARA, liquids and liquid wastes, gaseous waste system, semiannual effluent report evaluation, unapproved burial of a high integrity container and tours of Units 1 and 2/3.

The inspection involved 94 hours onsite by one inspector.

Results: Of the areas inspected, no violations or deviations were identified.

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## DETAILS

### 1. Persons Contacted

\*J. Haynes, Station Manager  
#R. Kreiger, Deputy Station Manager  
J. Albers, Health Physics Supervisor, Units 2/3  
T. Adler, Radioactive Materials Control (RMC) Foreman  
D. Brevig, Supervisor, Chemistry  
\*#P. Croy, Manager, Compliance  
#M. Fieldman, Compliance Engineer  
D. Gregory, Supervisor Radiation Monitoring I&C  
\*K. Helm, Effluent Engineer  
\*D. Herbst, Independent Safety Engineering Group (ISEG)  
\*#R. Jervy, Quality Assurance Engineer  
J. Kelly, RMC Supervisor  
\*C. Kergis, Compliance Engineer  
P. King, Operations QA Supervisor  
\*P. Knapp, Manager, Health Physics  
\*T. Macke, Jr., Supervisor, Compliance  
J. Madigan, Health Physics Supervisor, Unit 1  
\*H. Mathis, NGS Department Assistant  
\*H. Morgan, Operations Manager  
G. Mueller, Surveillance Coordinator  
G. Peckham, Supervisor, Dosimetry  
R. Santosusso, I&C Supervisor  
S. Schofield, ALARA Supervisor  
\*D. Schone, Manager, Site QA  
P. Shaffer, Coordination Supervisor Radwaste  
R. Stempien, Acting Planning Supervisor, Maintenance  
\*D. Stickney, NSSS Engineer  
#R. Warnock, Health Physics Engineering Supervisor  
#P. Wattson, Compliance Engineer

\*Denotes those present at the exit interview on April 5, 1985.

#Denotes those present at the exit interview on April 16, 1985.

In addition to the individuals identified above, the inspector met and held discussions with other members of the licensee's and contractors staff.

### 2. Licensee Action on Previous Inspection Findings

(Closed) Followup (50-206/85-03-01, 50-361/85-02-01, 50-362/85-02-01)

Inspection Report Nos. 50-206/85-03, 50-361/85-02 and 50-362/85-02 identified the failure to include certain monitoring information in individual personnel monitoring files. It was established that at the time of the inspection individual personnel monitoring files in the custody of Corporate Documentation Management (CDM) were being microfilmed. Records received by CDM after the start of the microfilming procedure were stockpiled at CDM for later inclusion in the individual files.

The licensee's methods for recording and documenting personnel exposures were reviewed. The dosimetry records system is fully computerized. Individual exposures are input to the computer on an on line basis for pocket ionization chamber (PIC) measurements from terminals in Units 1 and 2/3 as workers leave the access controlled area. TLD exposure data is input on a batch basis. Quarterly a report, SCE-SONGS Personnel Dosimetry Monitoring Control Report is generated listing personnel exceeding the maximum and 25 percent of the maximum administrative exposure limits. This quarterly report is used to demonstrate compliance with 10 CFR 20.101. The computer data base is backed up daily on tape. In addition, a streaming backup (forward recovery system) when combined with the daily tape backup permits recreation of the disc record in the event of a disc crash. Annual records are transferred to tape at the end of the year and stored in a Halon protected vault. Individual records are documented on microfiches in the form of the licensee's equivalent of NRC Form 5. Current individual records are immediately available on the system terminals.

The computer program requires validation of exposures when PIC and TLD measured exposures differ by  $\pm 25$  percent for exposures  $\geq 100$  mrem.

The computer system uses two programs SRC and TSO. SRC (SONGS Radiation Control) contains the current records data base, this program which is under the control of the Corporate Computer Group had been rigorously tested to ANSI standards.

TSO, the archive records system, used to generate quarterly and annual reports, is not a tested program but uses the SRC data base. The password protected TSO programming can be changed only by the Dosimetry Supervisor or his single delegate.

Personnel Dosimetry Monitoring Control Reports for 1984 and first quarter 1985 were examined. A total of 109 individuals exceeded 25 percent of the maximum quarterly limit with a high whole body exposure of 1957 mrem. No individual had exceeded 25 percent of the quarterly limit during the first quarter of 1985.

Termination letters are computer generated. Undeliverable letters are retained in the individuals file.

Procedures reviewed as a part of the inspection:

S0123-VII-4.0	<u>Personnel Monitoring Program Rev. 2</u>
S0123-VII-4.1	<u>Personnel Monitoring Computer Rev. 1</u>
S0123-VII-4.1.1	<u>Personnel Monitoring Files Rev. 2</u>
S0123-VII-4.1.2	<u>External Radiation Dosimetry Rev. 2</u> revised by TCN 2-1, 2/1/85, corrected procedural inconsistencies identified during the inspection of January 28 - February 1, 1985 (Inspection Report Nos. 50-206/85-03, 50-361/85-02 and 50-362/85-02).

Discussions with the licensee established that minors are not knowingly employed under circumstances where personnel monitoring is required. The inspector had no further questions with respect to this matter.

(Closed) Followup (50-361/85-09-06) Inspection Report No. 50-361/85-09 identified two observations regarding apparent radiological posting deficiencies in the Units 2/3 protected area. Followup inspection with respect to these matters established the following.

a. Radioactive Materials Storage Area

Material removed from the Units 2/3 controlled access area is surveyed and smear tested prior to release. Prior to uncontrolled release all items are moved to a low background laydown area adjacent to the Unit 2 makeup water demineralizer for a final survey. All items found to be contaminated are logged and the maximum count rate measured with a calibrated GM survey instrument is recorded. During first quarter 1985 approximately 150 such items representing a total activity of approximately six microcuries were identified. Title 10 CFR 20.203(e) requires posting as a radioactive materials area, locations where more than 10 times an Appendix C quantity of radioactive materials are stored. Based on an examination of records, the lay down area did not contain in excess of 10 times an Appendix C quantity at any time during the first quarter of 1985.

b. Contamination/High Airborne Area

On March 2, 1985, it was observed that the posting associated with the vent wier structure was obscured. Discussions with licensee personnel established that the vent wier structure is subject to routine surveys and air sampling at times when liquid radioactive waste is being discharged. The surveys and air sampling have never resulted in the identification of surface or airborne contamination.

Discussions with licensee representative established that in both cases identified above, posting had been inconsistent with the licensees procedures. Prompt corrective action had been taken to correct the deficiencies. In addition, the licensee established a routine surveillance program with specifically assigned responsible individuals, to assure that postings are maintained consistent with NRC and procedural requirements. In both cases the licensee's postings were more conservative than that required by 10 CFR 20, which would not have required that either area be posted. This matter is considered closed.

3. Review of Licensee Reports

The inspector reviewed Licensee Event Reports (LER) related to radiation protection, chemistry and waste management matters for all units. The inspector verified that reporting requirements were met, causes identified or under investigation, that corrective actions appeared appropriate and that LER forms were complete.



## Docket No. 50-206

85-01-L0 Failure to set R-1219 Alarm Setpoint to RETS

## Docket No. 50-361

85-04-L0 Delinquent Iodine and Particulate Purge Samples

85-05-L0 Spurious Train "A" Control Room Isolation System (CRIS) Actuations

85-07-L0 Containment Purge Isolation System Train "A" Actuations

85-07-L1 Containment Purge Isolation System Train "B" Actuation

85-13-L0 Spurious Control Room Isolation System (CRIS) Train "B" Actuation

85-14-L0 Spurious Control Room Isolation System (CRIS) Train "B" Actuation

85-15-L0 Fuel Handling Isolation System (FHIS) Actuation

## Docket No. 50-362

85-04-L0 Delinquent RCS Sample with Dose Equivalent Iodine Limits Exceeded

85-05-L0 Containment Purge Isolation System Actuation

85-09-L0 Spurious Containment Purge Isolation System Actuation

The inspector examined the Semiannual Effluent Reports for Units 1 and 2/3 for July-December 1984. Both reports were issued under cover letters dated February 23, 1985. No errors or anomalous data was identified. Further discussion concerning releases is contained in report section 10.

The licensee's Annual Radiological Environmental Operating Report for 1984 San Onofre Nuclear Generating Station Units 1, 2 and 3 was reviewed. The report provided program description, sample collection and analysis results and evaluation. The result of the land use census was included. In the general areas of direct radiation, soil sampling, shoreline sediment (beach sand), airborne particulate, airborne radioiodine, local crops, drinking water, ocean water, rabbit sampling and ocean bottom sediments, the licensee concluded that the operation of SONGS had a minimal or negligible impact on the environment. In the case of non-migratory marine species and kelp, the licensee concluded that the operation of SONGS had a detectable impact on the environment during 1984 when compared with control station samples. Releases of radioactive effluents from SONGS Units 2 and 3 are addressed in report section 10 (50-206/85-10-01, 50-361/85-10-01 and 50-362/85-09-01, Closed).

No violations or deviations were identified.

#### 4. Allegation Followup

(Closed) Allegation Number RV-84-A-00092

On August 20, 1984, Region V received an allegation which specified in part that an alcoholic beverage had been brought into the protected area in containers marked as radioactive material, that consumption of an alcoholic beverage had occurred within the protected area by persons in the Radioactive Materials Control organization and that management deficiencies existed within the Radioactive Materials Control organization. The alleger had documented and discussed these concerns with licensee management.

The inspector examined licensee management's response to these allegations. The inspector found that licensee management had effected organizational and staffing changes to correct licensee management identified deficiencies.

Procedures related to the receipt and transfer of radioactive materials were examined.

S0123-VII-8.3	<u>Receipt of Radioactive Material</u>
S0123-VII-8.4	<u>Transfer of Radioactive/Waste Materials between Units 2/3 and Unit 1</u> (Procedure deleted January 1985)
S0123-VII-7.3.2	<u>Release of Potentially Contaminated Items from the Restricted Area.</u>

Discussions with health physics, radwaste, and chemistry personnel established that the only samples collected outside the protected area were clear water contained in translucent polyethylene containers. The security staff had samples of the containers and had received training as to the types of samples to expect and the appropriate response in questionable cases.

Empty 55 gallon drums used for packaging waste are opened and inspected on receipt in the protected area. Empty radioactive materials shipping casks are opened and inspected, prior to use by a number of individuals representing various specialties, e.g., health physics, radioactive materials control, and crane operator.

Small packages were X-rayed or physically inspected prior to entry into the protected area.

Packages containing radioactive materials, e.g., sealed sources and standards, are inspected by radiation protection when opened in the protected area, in addition to the inspection for external contamination and dose rate on receipt. Additional matters related to this allegation were addressed in Inspection Report Nos. 50-206/85-15, 50-361/85-14 and 50-362/85-13.

No violations or deviations were identified.

Allegation Number RV-85-A-003

On January 16, 1985, an individual (allegor) reported comments made by a second party concerning personnel sleeping while on shift. In the first instance, SCE health physics personnel were alleged to have been sleeping in a "radioactive area" in containment and in the second case contract personnel were alleged to have been sleeping in the radwaste building (24 foot elevation). The allegor was interviewed by telephone at home in an attempt to arrange an interview with the allegors informant. The allegor was cooperative but the informant declined to be interviewed. Discussions with licensee personnel and observations by the inspector during tours were unsuccessful in establishing any additional facts supporting the allegation.

No violations or deviations were identified.

(Closed) Allegation Number RV-84-A-118

On December 10, 1984, a contract employee was interviewed by telephone in response to a telephone call received by the NRC headquarters duty officer on the weekend of December 8-9, 1984. The individual (allegor) requested confidentiality and expressed concerns related to the use of respiratory protective equipment in Unit 2 and that the exposure he received, 15 to 20 mrem per day, was more than the exposures received by his co-workers. The allegor also stated that he had not received ALARA training. The allegor was unable to identify the specific dates or Radiation Exposure Permit (REP) numbers associated with his Unit 2 work or the identity of individuals with whom he had worked. The allegor had not contacted the licensee's radiation protection management. The allegor was advised to bring his concerns to the attention of the licensee's radiation protection management and to recontact the Region V staff by collect telephone call following his discussion with the licensees' staff. The allegor failed to recontact the Region V staff and all efforts by telephone and mail to reestablish contact with the allegor were unsuccessful.

An examination of the allegors exposure records established no exposure in excess of any regulatory or licensee administrative limit. An examination of training records established that the allegor had successfully completed the required training for Red Badge area access including ALARA and Respiratory Protection training. The Certification of Training had been acknowledged with the allegors initials. No evidence with respect to inadequacies with the respiratory protection program were identified (84-12-28, Closed).

No violations or deviations were identified.

5. Organization and Management Controls

Reports of licensee audits and selected field surveillances activities, conducted since January 20, 1984, were examined.

Report No. SCES-053-84, Units 1 and 2/3 addressed Technical Specification (TS) requirements in the areas of sealed source leak tests and inventory; adherence to procedures, procedural consistence with 10 CFR 20 and the procedure approval and maintenance process; record retention; posting and technician staffing. No deficiencies were identified.

Report No. SCES-022-84, Units 1 and 2/3, addressed secondary chemistry and liquid waste related TS requirements. No deficiencies were identified.

Report No. SCES-32-84, addressed the dosimetry program. No deficiencies were identified.

Report No. SCES-040-84, Units 2/3, addressed TS and procedural compliance with respect to radwaste solidification and shipment. No deficiencies were identified.

Report No. SCES-082-84, Units 1 and 2/3, addressed TS and procedural requirements with respect to primary chemistry and radioactive effluents. No deficiencies were identified.

Report No. SCES-88-84, Units 1 and 2/3, addressed TS and procedural compliance with respect to radiological effluents, radiological environmental monitoring and primary chemistry. No deficiencies were identified.

Report No. SCES-012-84, Units 1 and 2/3, addressed TS compliance with radiation monitoring instrumentation operating requirements. One Potential Deficiency Notice (PDN) was generated related to a procedural inadequacy related to performance and documentation. The concern was promptly resolved by procedure revision.

Selected surveillance reports examined included:

HP-66-84 Verification of adequacy of health physics controls established with respect to the dry cleaning activities;

HP-84-84 Verification of procedure implementation related to a radiological incident;

HP-230-84 Addressed air flow control during radioactive materials handling;

HP-345-84 Addressed TS required annual sealed source leak test and inventory;

HP-369-84 Addressed the release of materials from Red Badge Zones. Procedural inconsistencies were identified which were promptly corrected; and

HP-455-84 Addressed shipment of radioactive materials.

The licensee conducted a well organized and documented audit and surveillance program in this area. Individuals conducting or



participating in the audits and surveillance activities were well trained and experienced in health physics, chemistry and radwaste (85-HN-03, Closed).

No violations or deviations were identified.

6. Control of Radioactive Materials and Contamination, Surveys and Monitoring

The Unit 1 survey, monitoring and contamination control program was discussed with licensee representatives. Routine surveys are performed on a scheduled basis. Survey instruments are calibrated at a central location. Formerly portable instruments were performance checked daily. On the basis of experience the performance checks are now conducted on a weekly basis. Results of surveys of radiation and contamination levels are posted at the access control location. An examination of posted surveys and survey records for the periods February 1-4, March 1-7 and April 1-3, 1985 established that surveys were well documented, and that current copies were available to workers.

Changing levels of contamination documented in survey records demonstrated continuing efforts to minimize both the level and extent of contaminated areas. Independent measurements using an NRC Eberline RO-2, SN2691, NRC-015843, due for calibration May 15, 1985, identified no areas in which posting was not in compliance with regulatory requirements. Surveys were performed outside the west and north controlled access area fence and during a tour of the controlled access area.

No violations or deviations were identified.

7. Maintaining Occupational Exposures ALARA

A. Audits and Appraisals

The inspector examined, Field Surveillance Report HP-065-85, conducted February 6-7, 1985, which addressed ALARA pre job review on all work resulting in exposures > 1 man Rem. No deficiencies were identified as a result of the surveillance.

Field Surveillance Report HP-54-83, conducted March 16, 1982, was conducted to determine compliance with procedure S0123-VII-3.0 ALARA Job Review.

B. ALARA Program Changes

Procedures applicable to the ALARA program were examined:

S0123-VII-3.0	<u>ALARA Job Review</u>
S0123-VII-3.1	<u>ALARA Design Review</u>
S0123-VII-3.2	<u>Temporary Facility Shielding Modifications</u>
S0123-VII-3.3	<u>Methods for Establishing ALARA Goals</u>
S0123-VII-3.5	<u>ALARA Program</u>

Discussion with the licensee's representative established that no major program changes had occurred in the past year. As initially established, ALARA reviews were performed when dose rates were at or above 5 mrem/hour. Based on experience the review guidelines were revised upward and are presently performed for jobs with 1 man Rem dose commitments or general area dose rates greater than 50 mrem/hour where respiratory protection is required. All jobs with dose commitments 10 man Rem and above receive both pre and post job review.

C. Worker Awareness and Involvement

The licensee had established an ALARA suggestion awards program. ALARA training was provided by the training department with input from the ALARA group. Discussion with plant personnel established that personnel were aware of and alert to ALARA concerns. The licensee had instituted the use of cool and cold zone signs.

D. ALARA Goals, Objectives and Results

In 1984, the licensee performed a study of the costs associated with manpower replacement due to personnel exposure limits. A survey of U. S. and foreign utilities was used to establish a mean dollars per person Rem value. The licensee's staff then independently calculated replacement costs for plant staff and long-term (400 hours) and short term (80 hours) contractors. The study concluded that \$4,000 per person Rem was the appropriate value at San Onofre to use for ALARA cost-benefit analyses.

Separate ALARA man Rem goals were established for Units 1 and 2/3 and were tracked on a continuing basis.

	<u>Unit 1</u>		<u>Units 2/3</u>	
	<u>goal</u>	<u>actual</u>	<u>goal</u>	<u>actual</u>
1984	582.698	510.983	1347.3	525.650
1985	300	-	765	-
(Units in man Rem)				

Annual goals were established in January based on the planned years work and previous exposure experience. During the year the goals were increased or decreased on a monthly basis as previously planned work was cancelled or unscheduled outages or special work occur. The significant discrepancy between the 1984 Units 2/3 goal and actual exposures was attributed to the fact that the period included the first Unit 2 refueling outage and to extensive training associated with the refueling.

During outages weekly reports were prepared which tracked exposures related to outage goals. At the conclusion of major outages, (e.g., Unit 3 steam generator outage October-December 1984 and Unit 2 first refueling outage October 1984 - March 1985) outage notebooks have been prepared. The notebooks have been prepared with the available staff and are neither a procedural or regulatory requirement

although they represent a valuable tool for future ALARA considerations. The notebooks are indexed by job code and title. The records include the ALARA dose estimate and accumulated dose, REP involved, work description, radiological conditions including survey records, problems and ALARA considerations. In some cases drawings of equipment or facilities or photographs are included.

Notebook entries for the following jobs were examined:

Industrial radiography contractor, 73 curie, Ir-192 sealed source recovery;

Reactor Vessel Key and Keyway Inspection;

Relocation and Installation of Pressurizer Spray Valve.

No violations or deviations were identified.

#### 8. Liquids and Liquid Wastes

The inspector examined the control and quantification of radioactive liquids for Units 2/3.

##### A. Audits and Appraisals

Audits and field surveillance are discussed in report section 3.

##### B. Changes

The following procedures were examined:

S0123-III-1.12.23	<u>Units 2/3 Reactor Coolant Specific Activity (Non Iodine)</u>
S0123-III-5	<u>Effluent Monitoring Program</u>
S0123-II-5.1.23	<u>Effluent Sampling and Analysis</u>
S0123-III-5.2.23	<u>Radioactive Liquid Sampling and Analysis</u>
S0123-III-5.4.23	<u>Liquid Effluent Monitor Setpoint Determination</u>
S0123-III-5.8.23	<u>Units 2/3 Manual Calculation of Liquid Effluents</u>
S0123-III-5.10.23	<u>Liquid and Gaseous Effluent Dose Determination (Manual Method)</u>
S0123-III-5.11.23	<u>Units 2/3 Liquid Effluent Release Permit</u>
S0123-III-5.14.23	<u>Units 2/3 Radiological Release Report Generation System</u>

S0123-III-5.19.23

Units 2/3 Apple Computer Operation for  
the Generation of Radioactive Effluent  
Release Reports

S0123-III-5.30.23

Effluent Reports and Records Retention

Procedures have been revised at approximately 3 to 4 month intervals as a result of developmental modifications. Within the last 18 months an original 30 procedures relating to liquid and gaseous effluents had been reduced to about 14 for Units 2/3. Major changes were due to changes to and implementation of the ODCM. Prior to implementation of revised procedures, revisions are discussed with the chemistry technicians. Generally a week was allowed for technician review and comment followed by final revision and correction. Training of technicians on revised procedures was documented in a memo to the Training Department which incorporates the record into the training records system. No significant changes were made to sample line or sampling station shielding or the post-accident accessibility. The PASS system was modified by the addition of isolation valves with appropriate procedure revisions.

C. Effluents

Review of Semiannual Effluent Reports are discussed in report sections 3 and 10. Records of liquid waste releases were examined for January 1985. A total of 20 liquid waste release permits were generated during this period.

	<u>1984</u>	<u>Jan. 85</u>	<u>Feb. 85</u>
Miscellaneous Liquid Waste			
Processed and Released (gallons)	4.2E6	3.1E5	3.6E5
average per day (gallons)	1.1E4	9.9E3	1.3E4
number of releases	(ND)	14	17
Coolant Radwaste Processed and Released (gallons)	4.4E6	1.0E5	1.3E5
average per day (gallons)	1.2E4	3.3E3	4.8E3
number of releases	(ND)	2	2
Total gallons	8.7E6	(ND)	(ND)
Total resin expended (cubic feet)	959	(ND)	(ND)

(ND) - Not determined.

No discrepancies were identified with respect to effluent release requirements or documentation.



At the time of the inspection, the licensee was preparing to implement a change in the computer used to prepare release permits and document and report releases. The draft procedure S0123-III-5.19.23 Unit's 2/3 IBM Computer Operation for the Generation of Radioactive Effluent Release Permits was examined. Manual verification calculations had been performed and were reviewed. The calculations reviewed included both pre and post release calculations for a variety of sources.

<u>Release Type (Computer runs of Simulated releases)</u>	<u>Source</u>	<u>Manual Calculation</u>	
		<u>Pre</u>	<u>Post</u>
Batch Liquid Waste Release Permit	T-075	X	X
Batch Liquid Waste Release Permit (a)	Waste	X	
Continuous Liquid Waste Release Permit (a)	Waste	X	
Continuous Unit 2	Turbine Sump		
Continuous Unit 3	Turbine Sump		
Continuous Unit 2	Neutralization Sump	X	
Batch Unit 2	Neutralization Sump		
Continuous Unit 3	Neutralization Sump	X	X
Batch Unit 2 S. G. Blowdown	E-089	X	X
Continuous Unit 3 S. G. Blowdown	E-089		
Batch Unit 2 S. G. Blowdown (b)	E-088		
Continuous Unit 3 S. G. Blowdown (b)	E-088		
Batch (b)	T-057		

(a) Applicable to unmonitored non normal pathway release.

(b) Identical release parameters - different release modes - results identical. Different monitors, doses different for different dilution rates, total release identical.

The inspector verified by manual calculation the dose to the total body, bone, liver, thyroid, kidney, lung and GI-LLI for  $H^3$ ,  $Fe^{59}$ ,  $Nb^{95}$  and  $I^{131}$  for a batch release from T-075 (Miscellaneous Waste Condensate Tank) for release permit No. 52-0025. A total of

23 nuclides were identified in the release permit. Using ODCM control copy 13, the inspector verified the use of ODCM dose conversion factors.

The licensee reported no problems in the operation and maintenance of the liquid waste system. Principal sources of activity in releases continued to be due to the high Unit 3 primary system activity and the licensee's practice of not recycling reclaimed water from the liquid waste system.

No unmonitored release paths were identified. Liquid effluents were within the 10 CFR 50 Appendix I design objectives and were by definition ALARA and within the 40 CFR 190 guide lines (see report section 10 for comparison of FSAR vs actual releases). The inspector verified that the following Technical Specification (TS) Surveillance Requirements were satisfied:

- 4.11.1.2      Dose Calculations
- 4.11.1.1.1    Batch releases, sampled, analyzed and dose  
calculated in accordance with the ODCM prior to  
release.

#### D.    Instrumentation

The inspector verified that procedures establish the method for process and effluent monitor setpoint determination in accordance with the ODCM. The methods were understood by the technicians and operators affected.

The quarterly QA procedure calls for  $\pm 20$  percent agreement between monitor readings and laboratory measurements. Difficulty had been experienced in meeting this requirement resulting in frequent monitor recalibrations. During the Unit 2 outage which was concluding at the time of the inspection, 40 to 50 DCPs were processed to correct previously identified monitoring instrument problems. The effectiveness of the corrective action will be determined after Unit 2 returns to service. Monitoring instrument calibrations and surveillance were discussed with Radiation Monitoring I&C staff personnel and records of instrument calibrations were examined.

#### E.    Reactor Coolant and Secondary Water

The inspector discussed TS 3/4.4.6 Reactor Coolant Chemistry and examined chemistry records for July 1984.

Analyses were performed for boron, chloride, fluoride, dissolved oxygen and specific activity including dose equivalent iodine three times per week. Values were within the limits specified in TS Tables 3.4-2 Reactor Coolant System Chemistry, 4.4-3 Reactor Coolant system Chemistry Limits Surveillance Requirements, 4.4-4 Primary Coolant Specific Activity Sample and Analysis Program and TS 3/4.4.7 Specific Activity.

No violations or deviations were identified.

## 9. Gaseous Waste System

The inspector examined the control and quantification of radioactive gaseous and particulate waste for Units 2/3.

### A. Audits and Appraisals

Audits and field surveillance are discussed in report section 3.

### B. Changes

The following procedures were examined:

S0123-III-5.7.23     Units 2/3 Gaseous Effluent Monitor Setpoint Determination

S0123-III-5.12.23     Units 2/3 Gaseous Effluent Release Permit

In addition, certain procedures referenced in report section 8B relate to gaseous as well as liquid wastes. Further the discussion with respect to procedural revision in that report section is applicable to both liquid and gaseous waste procedures. No significant changes in sampling line or station shielding or post-accident accessibility were noted.

### C. Effluents

Review of Semiannual Effluent Reports is discussed in report sections 3 and 10. Records of gaseous waste permits and releases in February 1985 were examined. No discrepancies were identified with respect to effluent release requirements or documentation. As noted in report section 8C, the licensee was preparing to implement a change in the computer used to generate and document pre and post effluent release permits. The licensee's computer program validation manual calculations were examined.

<u>Type of Release (Computer runs of simulated releases)</u>	<u>Flow Rate where applicable</u>	<u>Manual Permit</u>	
		<u>Pre</u>	<u>Post</u>
Batch Gaseous Waste Release Permit	-	X	X
Continuous Gaseous Waste Release Permit (Plant Vent Stack)	-	X	X
(Unit 2 Condenser Air Ejector)	-	X	X
(Unit 3 Condenser Air Ejector)	-	X	X
Containment Purge Permit			
(Unit 2)	40kcfm	X	X
(Unit 3)	2kcfm	X	
(Unit 2)	2kcfm	X	

## Volume Control Tank Release Permit

(Unit 2)	50cfm	X
(Unit 3)	50cfm	X

## Batch Gaseous Waste Release Permit

(Waste Gas Decay Tank)	-	X	X
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The inspector verified by manual calculation the gamma and beta air doses and total body dose rate due to Kr<sup>85</sup>, Xe<sup>131m</sup> and Xe<sup>133</sup> for waste release permit No. SG-0046-0, source T-87, batch gaseous waste release. The use of ODCI identified dose conversion factors was verified.

Waste Gas Decay Tank Releases and Average Decay Periods

<u>Period</u>	<u>Number of Tanks Discharged</u>	<u>Average Decay Days</u>
1984	39	36
January 1985	3	57
February 1985	0	-
March 1985	4	60

Discussions with licensee personnel established that problems had been experienced with the gas strippers and the Unit 3 degas line which had caused some unplanned releases.

Principal releases of noble gases, particulates and iodines were all due to continuous release mode rather than batch release mode. No unmonitored release paths were identified. Releases were within 10 CFR 50 Appendix I limits and were therefore by definition ALARA and within the 40 CFR 190 guidelines.

TS 3.11.2.6 limits the contents of any waste gas decay tank to 134,000 curies and TS 4.11.2.6 requires verification of the curie content once per 24 hours while waste gas is being added to the tank. The licensee compared the analysis of waste gas decay tank contents with dose rates in a document dated October 11, 1984, title ITA E84-373, Determination of Method for Estimating Curie Content of Waste Gas Decay Tanks at SONGS 2/3. The study established that a dose rate of 190 mr/hr and a concentration of 338 uCi/cc (Xe-133) correlated to tank contents of 134,000 curies at a pressure of 300 psi. This technique had been incorporated in procedures and was in routine use to verify tank contents. Licensee personnel reported that a maximum dose rate of 25 mr/hr (equivalent to a concentration of 43 uCi/cc) was the highest concentration observed.

D. Instrumentation

As noted in report section 8.D significant DCP work on monitoring systems was conducted during the Unit 2 outage. Effluent monitoring instrument calibration and surveillance was discussed with Radiation



Monitoring I&C personnel. Calibration records of four monitors were examined. Methods for establishing process and effluent monitor setpoints were described in procedures and for effluent monitors in the ODCM. The setpoint basis were understood by the affected operators and technicians. Units 2/3 liquid and gas monitor availability had declined significantly during the past six months due to increases in DCPs, surveillance, maintenance and calibration requirements and due to the Unit 2 refueling outage.

The available operating time for the period was:

September 1984	77.7%
October 1984	73.9%
November 1984	70.6%
December 1984	59.2%
January 1985	65.9%
February 1985	53.56%

Downtime contributing factors for February 1985 were, surveillance 20 percent, maintenance 10 percent, 18 months calibration 11.54 percent and DCP 5 percent.

#### E. Air Cleaning Systems

TS 3/4.7.5 Control Room Emergency Air Cleaning System and 3/4.9.12 Fuel Handling Building Post-Accident Cleanup Filter system require operability demonstration and surveillance testing. The inspector verified the performance of staggered 31 day tests of the Control Room system by review of records of Operator Surveillance Test S023-3.20 Rev. 7, attachment 7.2, check off list No. 2, TCN-7-2 for the period December 1984 through March 1985. The 31 day staggered test of the Units 2 and 3 Fuel Handling Building systems were verified for the period October 1984 through March 1985 by review of Operator Surveillance Test S023-3-3.24 Rev. 3 check off list No. 2.

The licensee uses the services of a contractor, most recently National Air Filtration Testing Associates, Inc. (NAFTA), for the performance of HEPA filter and charcoal absorber in place testing. The inspector verified that the required testing had been completed by examination of NAFTA reports for: Control Room system testing - February 1983, Unit 2 Fuel Handling Building system - June 1984, Control Room system and two trains of the Unit 2 and one train of the Unit 3 Fuel Handling Building systems - November 1984.

At the time of the November 1984 test sequence Unit 3 Fuel Handling Building train ME-371 had required filter replacement after actuation of the deluge system. Filter replacement could not be completed in a sufficiently timely fashion to meet the NAFTA test schedule. Retesting is planned prior to the Unit 3 refueling outage.

No violations or deviations were identified.

10. Semiannual Effluent Report Evaluation

High Unit 3 primary system activity and the licensee's decision not to recycle water reclaimed from the liquid waste processing system (see Inspection Report No. 50-206/85-C3, 50-361/85-02 and 50-362/85-02 report section 2) had resulted in significant liquid releases. The releases reported in Semiannual Effluent Reports for 1984 were compared with projected releases contained in Units 2/3 FSAR Tables 11.3-9, gaseous effluents and 11.2-38, liquid effluents. The FSAR values were based on the assumed use of the waste evaporator and recycling of recovered water.

The comparisons were done for selected nuclides and for calculated doses.

Units 2/3 Gaseous Effluents 1984

<u>Nuclide</u>	(A) Total Curies Released	(B) Curies/Unit/Year FSAR Table 11.3-9	Ratio
			$\frac{A}{B \times 2}$
Kr-85	6.97E1	7.1E2	4.9E-2
Kr-85m	1.85E1	4.8E1	1.92E-1
Xe-133	3.82E4	1.4E4	1.36E0
Xe-135	1.2E3	1.2E2	5E0
I-131	4.07E-1	3.5E-1	5.81E-1

Annual Calculated Dose Comparison

<u>Type of Exposure</u>	<u>Calculated Dose</u>	<u>TS Limit 2 Reactors</u>
Gamma air dose (mrad) TS 3.11.2.2b	10.07	20
Beta air dose (mrad) TS 3.11.2.2b	24.48	40
Tritium, Iodine, Particulate		
Organ (mrem) TS 3.11.2.3b	3.78	30

Units 2/3 Liquid Effluents 1984

<u>Nuclide</u>	(A) Total Curies Released	(B) Curies/year/unit FSAR Table 11.2-38	Ratio
			$\frac{A}{B \times 2}$
H-3	4.54E2	5.8E2	0.39
Sr-89	1.37E-3 (a)	7.1E-7	9.5E2
Sr-90	<LLD (a)	2.1E-8	-
Zr-95	4.17E-1	1.2E-7	1.7E6
I-131	1.06E0	5.1E-3	1E2
Cs-137	2.40E0	4.1E-4	2.9E3
Cr-51	2.72E0	4.0E-6	3.4E5
Mn-54	2.74E-1	6.7E-7	2.0E5
Co-58	3.33E0	3.4E-5	4.8E4
Fe-59	2.84E-1	2.1E-6	6.7E4
Co-60	6.35E-1	4.3E-6	7.3E4

Annual Calculated Dose Comparison

<u>Type of Exposure</u>	<u>Calculated Dose</u>	<u>TS Limit 2 Reactors</u>
Total Body (mrem) TS 3.11.1.2b	0.49	6
Organ (mrem) TS 3.11.1.2b	9.8	20

The licensee was aware of the discrepancy of the liquid release in comparison with the FSAR projected releases. The licensee had established a task force whose goal was the reduction of radioactive material contained in liquid effluents (Inspection Report Nos. 50-206/85-03, 50-361/85-02 and 50-362/85-02 section 2). This matter was addressed during the exit interview.

No violations or deviations were identified.

11. Unapproved Burial of High Integrity Container (HIC)

On March 20, 1985, the licensee shipped (shipment No. II-SW-85-1) a NUPAC EA-190 HIC containing 112.127 curies as LSA for burial at the U.S. Ecology, Richland, Washington, low-level radioactive waste disposal facility. A confirmation of receipt dated March 25, 1985, was received from U.S. Ecology, which noted no discrepancies between wastes listed on the manifest and the waste materials received.

On March 26, 1985, the Radioactive Materials Control (RMC) Supervisor at SONGS received a telephone call from the Department of Social and Health Services, State of Washington. The RMC Supervisor was informed that the HIC had been received at U.S. Ecology, inspected by the state inspector, and found to be in order, then buried. The State representative stated that although a letter from the Head of Radiation Control Section, Department of Social and Health Services to NUPAC had authorized SONGS to use two EA-190 HICs, that use was contingent on (1) successful completion of drop and pressure tests, (2) approval of the tests by the State of Washington and (3) issuance of a formal written approval of the HIC by the State of Washington. He stated further that although the test data on NUPAC HIC's EA-50, EA-142 and EA-190 had been received and written approval issued for the EA-50 and EA-142 HICs, the EA-190 had not received written approval.

The RMC Supervisor contacted NUPAC and the RMC Shipping Broker and obtained the following information. Since this was the first HIC used by SONGS, the RMC Shipping Broker had maintained regular contact with NUPAC prior to shipment. On the day before the shipment NUPAC informed SONGS that no problems existed and that if any developed NUPAC would contact SONGS before the shipment departed. The shipment was made as scheduled in the belief that all requirements had been satisfied. On March 25, 1985, SONGS contact at NUPAC learned that the necessary approval for the HIC had not been issued. NUPAC then telephoned the Department of Social and Health Services and notified them that the HIC EA-190 shipment had been made. The state representatives reportedly assured NUPAC that the necessary letter approving the EA-190 HIC would be issued that day and that there would be no problem in burying the HIC. (Inspectors note: If

at that time the State of Washington had indicated that the HIC should not be buried, the shipment could have been returned to SONGS or held in above ground storage at U.S. Ecology pending issuance of the letter of approval).

Based on the information received from NUPAC, the RMC Supervisor telephoned the Department of Social and Health Services. The sequence of events was explained to the State representative. The SONGS representative reported that the State representative indicated that no significant problem existed as a result of burial of the HIC. He is reported to have said further that the receipt and burial had gone extremely smoothly. The RMC Supervisor then asked if SONGS could have a copy of the letter of approval of the HIC EA-190 since an additional shipment was planned. The state representative stated that the letter had not actually been written the previous day, March 25, 1985, but that it would be later that week or early the following week. He further indicated that SONGS was being approved for additional EA-190 HICs during the next quarter and that both letters would be sent to SONGS at the same time.

In a letter dated April 9, 1985, SONGS informed the Department of Social and Health Services, State of Washington, of procedural changes being implemented at SONGS to assure that all necessary approvals had been received and requirements satisfied prior to future shipments.

In a letter from the Department of Social and Health Services dated April 9, 1985, the State of Washington informed SONGS that the shipment and burial of the EA-190 HIC violated conditions (27)(j) and (27)(m) of U.S. Ecology's radioactive materials licensee No. WN-1019-2 and 10 CFR 30.41(c) in that the transfer to an agreement state licensee was not consistent with the waste forms identified in the agreement state license. The letter stated in part that, "...the nature and quantity of violations found on this shipment do not, at this time, justify withholding of authorization to use the commercial low-level radioactive waste disposal site...." SONGS was required to respond to the State of Washington regarding the violations.

In a letter dated April 29, 1985, SONGS to State of Washington, SONGS requested confirmation of telephonic information that the SONGS letter of April 9, 1985, had been fully responsive to the State of Washington's concerns. In addition, the letter requested confirmation that SONGS was authorized to use and bury two EA-190 HIC's pursuant to a Department of Social and Health Services, State of Washington letter dated April 4, 1985, addressed to the President NUPAC, which provided for a continuation of the interim approval of certain high integrity containers until June 30, 1985.

The licensee recognized with respect to this sequence of events that failure to obtain written confirmation of authority for burial was in error. However, the verbal assurances given to SONGS by a representative of the Department of Health and Social Services, State of Washington, prior to burial of the HIC were such that reasonable persons would have been reassured that burial was in fact acceptable. For this reason no violations or deviations were identified.



## 12. Facilities Tours

The inspector toured Unit 1 including the technical support center, chemistry laboratory, counting room, access control area at "Door 16" and controlled access areas excluding the containment and fuel handling building. The tour in Units 2/3 included the health physics office and laboratory, chemistry office, access control area, common auxiliary/radwaste building and portions of the turbine building and radwaste laydown areas. Surveys were performed using NRC survey instrument, NRC-015843, an Eberline RO-2, SN 2691, due for calibration on May 15, 1985.

No violations or deviations were identified.

## 13. Exit Interview

The results of the inspection were discussed with the individuals denoted in report section 1 on April 5 and 16, 1985. The licensee was informed that no violations or deviations had been identified.

Two matters of concern were identified:

- (1) The level of liquid radioactive waste discharges particularly in comparison with FSAR projected values. The significance of these releases was highlighted by the fact that the Annual Radiological Environmental Operating Report for 1984 received by the NRC Region V on May 1, 1985, reported that San Onofre had a detectable impact on non-migratory marine species.

Mr. Haynes acknowledged NRC's concerns and stated that Southern California Edison was vigorously pursuing measures to reduce the radioactive material contained in plant effluents.

- (2) The shipment and burial of a high integrity container without positive verification of the required approvals was addressed. The licensee acknowledged a procedural weakness on which prompt corrective action had been taken.