U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-206/87-19, 50-361/87-18 and 50-362/87-20

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

Inspector: _____ 9-2-87
J. E. Russell, Radiation Specialist — Date Signed

Approved by: _____ 9/3/87
G. P. Yuhas, Chief — Date Signed
Facilities Radiological Protection Section

Summary:

Inspection on August 3-7 and August 17-20, 1987 (Report Nos. 50-206/87-19, 50-361/87-18 and 50-362/87-20)

Areas Inspected: Routine, unannounced inspection of licensee action on items of non-compliance, inspector identified problems, unresolved items and open items; Units 1, 2 and 3 - organization and management control; Units 1, 2 and 3 - training and qualification; Unit 2 - occupational exposure during extended outages; Units 1, 2 and 3 - collection of collocated thermoluminescent dosimeter (TLD) measurements; in-office review of the 1986 Annual Radiological Environmental Operating Report; and including tours of the licensee's facilities. Inspection procedures 2500/22, 30703, 83722, 83723, 83729, 90713, 92701, and 92702 were addressed.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Personnel

H. Morgan, Station Manager
M. Wharton, Assistant Technical Manager
M. Short, Nuclear Training Manager
J. Scott, Health Physics (HP) Supervisor
J. Kelly, Radioactive Material Control (RMC) Supervisor
E. Bennett, Quality Assurance (QA) Engineer
M. Zenker, Compliance Engineer

All of the above noted individuals were present at the exit interview on August 20, 1987. In addition to the individuals identified, the inspector met and held discussions with other members of the licensee's staff.

2. Licensee Action on Items of Non-compliance

Item 50-206/87-12-01 violation. (Closed) Records of the results of leak tests performed on November 17, 1986, on sealed source serial numbers 92-0152 white, 92-0152 gold and 92-0152 green were not maintained as required by Technical Specification (TS) 6.10. The inspector verified that action indicated in the licensee's timely reply to assure that the results of leak tests are properly recorded was complete and appeared to be effective to prevent recurrence.

Item 50-206/87-12-02 violation. (Open) Effluent monitor R-1254 did not bear the required labels for the two 100 microcurie Cs-137 sealed sources it contained. The inspector verified that action to relabel the monitor as indicated in the licensee's timely reply had been completed. Further action to consider use of more permanent labels was not yet complete and will be reviewed during a subsequent inspection. Actions to reinstruct responsible individuals and to inspect other radiation monitors to ensure labels are affixed appeared to be adequate to prevent recurrence.

Item 50-206/87-05-07 violation. (Open) Eight boxes were found in a housekeeping area which were not labelled in accordance with HP Procedure SO123-VII-7.4, adherence to which is required by TS 6.11. The inspector verified that radioactive materials in the areas toured were appropriately labelled in accordance with the requirements of the procedure. The inspector was also informed that the HP Manager had taken action to more clearly define responsibilities for labelling radioactive materials. Action indicated in the licensee's timely response to incorporate guidance into station procedures was not yet complete and will be reviewed during a subsequent inspection.

3. Licensee Action on Inspector Identified, Unresolved and Open Items

Item 50-206/86-21-04 (Closed) Calculations to verify that the Post Accident Sampling System could be operated while maintaining exposures

less that the General Design Criteria 19 levels were not previously available. The inspector verified that the calculations had been located, were on file and did appear to provide verification that the system could be operated to the GDC 19 levels.

Item 50-206/06-18-87. (Closed) A representative of the State of California reported that elevated levels, 41,400 pCi/l, of H-3 had been detected in the San Onofre Nuclear Generating Station (SONGS) Unit 1 sea water split sample for the second calendar quarter of 1987. The inspector determined that the sample, which was taken by a contractor with half sent to the State and half analyzed for SONGS, was obtained during a batch discharge directly over the discharge point. The tank contained approximately 148 Ci of H-3 at a concentration of 0.77 microcuries/ml. The tank was discharged at 28 gpm into a dilution flow of 300,000 gpm from the Circulating Water System. The concentration as determined by the State and confirmed by SONGS contract laboratory appeared to be approximately as expected if the sample were obtained directly over the discharge point.

Item 50-361/06-20-84. (Closed) Purge/Vent Stack Wide Range Monitor 3RE-7865 was removed from service when the high range check source channel failed during performance of monthly surveillance. The inspector verified that grab samples, flow rate estimates and auxiliary sampling appeared to have been initiated in accordance with Limiting Conditions for Operation (LCO) 3.3.3.9 and 3.3.3.1. Licensee investigation determined that this was a spurious failure of the high range check source channel, that no further corrective action was required and that the monitor should be returned to service.

Item 50-362/86-02-04. (Closed) An inspector identified item was opened to followup irradiated fuel particle (IFP) decontamination of the Unit 3 Fuel Handling Building (FHB) and to evaluate licensee actions to evaluate personnel skin exposures from these particles. The inspector verified that the Unit 3 FHB had been decontaminated and returned to street clothes access status and that procedures had been implemented to determine personnel skin exposures from the esoteric isotopes associated with IFPs.

Item 50-362/87-12-01. (Open) An unresolved item was opened to determine whether the SONGS Whole Body Counting System (WBCS) was capable of detecting the esoteric isotopes associated with IFPs within the 40 MPC-hr limit. The inspector determined that the licensee had taken action to have their WBCS software appropriately revised but that that action was not yet complete. The licensee had also delayed a review of WBC spectra to determine whether significant IFP intakes had previously been missed until the software revisions have been completed.

Item 50-362/87-12-02. (Open) An inspector identified item was opened to evaluate whether IFPs presented any unique internal exposure hazard should they be inhaled. The HP Manager indicated that an evaluation was being performed for SONGS by a contract organization and was not yet available.

Item 50-362/84-09-XO. (Closed) A licensee report noted that monitors 3RT-7818 and 3RT-7870 were out of service and grab sampling required by LCO 3.3.3.9 was not performed within the 8 hour time limit, the sample was 1 hour and 45 minutes late. The sample was not obtained as the temporary sample pump was inadvertently deadheaded. The inspector verified that an alternate path was subsequently provided to prevent deadheading the pump and that procedure SO23-II-4.3.6 was revised to provide additional precautions and note the possibility of flow path alterations which could affect Chemistry sampling. There appeared to be no further safety concerns in this matter.

Item 50-362/85-05-XO. (Closed) A licensee report noted that reactor coolant specific activity exceeded the 1.0 microcurie/gram dose equivalent I-131 limit due to iodine spiking following shutdown. The inspector verified that problems with excess coolant fission product activity had been common at the time of the report and had been relieved following fuel reconstitution in early 1986. There appeared to be no further safety concerns associated with this problem.

Item 50-362/87-06-LO. (Closed) A licensee report noted that train "A" of the Containment Purge Isolation System (CPIS) was spuriously actuated due to a loss of power caused by a blown fuse. The inspector verified that the fuse was replaced and proper operation of the monitor was verified prior to returning the unit to service. The Unit was operating at 100% power at the time, containment purge was not in service and no release occurred.

Item 50-362/87-09-LO. (Open) A licensee report noted that train "B" of the CPIS had been spuriously actuated during performance of a shiftly surveillance test. Licensee investigation revealed that movement of a cable mounted on the monitor panel door caused the actuation and that similar actuations had occurred. The inspector verified that action had been taken to alert personnel to use caution when opening and closing the panel door. Additional corrective action to install retainer clamps on the cable connector to limit the motion of the cable will be reviewed during a subsequent inspection.

Items 50-206, 361, & 362/12-10-86. (Closed) The licensee provided a special notification that a NUPAC shipping cask, Certificate of Compliance USA/9176/A, containing a spent resin shipment had left the site enroute to a disposal site without a vent port plug installed. This would normally be considered a severity level V violation in that the installation of the plug is required by the Certificate of Compliance. However, the inspector determined that the licensee identified the problem shortly after the shipment left the site; that expeditious action was taken to find the shipment, verify that no release of radioactive material had occurred and reinstall the plug; and that a procedure change was made to procedure SO123-VII-8.2.6 to specifically require verification of vent plug installation for subsequent shipments. It appeared to the inspector that this event was the result of a personnel error which could not reasonably be expected to have been prevented by action taken to correct previous deficiencies. Therefore, a violation for this event will not be issued as allowed by 10 CFR 2 Appendix C.

Items 50-206, 361, & 362/87-02-P1. (Closed) A report in accordance with 10 CFR 21 from GA Technologies indicated that coaxial cable resistance in some containment high range monitors was not sufficient at high temperatures to allow the instruments to operate properly. The inspector determined that, although the indicated instruments were in use at SONGS, the cabling in question had been replaced by a different brand of cabling where the potential for high temperatures exists. The equipment deficiency therefore appears not to be applicable to the SONGS containment high range monitors.

4. Licensee Action on IE Information Notices

The inspector verified that the licensee had received, reviewed and had taken action on IE Information Notices Nos. 85-52, 86-86, 86-90, 86-103 and 86-107.

5. Annual Radiological Environmental Operating Report

The inspector performed an in-office review of the 1986 Annual Report to verify compliance with the requirements of TS 3/4.12. The report revealed that radiation doses measured by TLD at locations near SONGS were comparable to those at the control location in Huntington Beach. Environmental samples of air, drinking water, local crops, soil, shoreline sediments, and ocean water revealed no plant associated radionuclides however air samples did reveal the presence of I-131 which was attributed to the Chernobyl accident and soil and local crop samples revealed the presence of Sr-90 and Cs-137 which was attributed to weapons tests. Plant related isotopes were detected in marine animals, kelp and in one ocean bottom sediment sample but were considered by the report to be of minimal impact on the environment and were below the reporting limits of TS Table 3.12-2. A land use census for 1986 and a summary of the interlaboratory comparison program were also contained in the Annual Report and appeared to meet the requirements of TS 3/4.12.2 and 3, respectively.

No violations or deviations were identified.

6. Organization and Management Controls: HP, Chemistry and RMC

The inspector reviewed the organization and management controls of the HP, Chemistry and RMC groups with the Unit 2/3 HP supervisor, the Chemistry Manager and the RMC Manager, respectively, both as regards their normal operational structure and as planned for the upcoming Unit 2 refueling outage, see paragraph 8. of this report.

There appeared to have been no significant structural changes in the HP and RMC organizations from those identified in previous reports with the exception of the inclusion of additional personnel and the addition of some specialized functions for the outage. The HP general foreman indicated that 67 contract personnel would be added for the outage to the operational HP group to fill technician and technician supervisor positions and the RMC Manager indicated that 55 contract personnel would be added to the RMC group to fill laundry and deconner positions. These

additional personnel will complement the 35 operational HP and 49 RMC SCE personnel that will be dedicated to the outage.

The Chemistry organization is under the Technical Manager rather than the HP Manager and has undergone some internal changes since last reviewed. The Technical Administrators were placed under an Instrumentation lead that is under the Chemistry Engineering Supervisor making this an independent group in parallel with the Engineering staff. The Chemistry staff is also now composed entirely of SCE personnel, no contract personnel are employed, and all are fully qualified.

Recent changes had also occurred in the office locations of the Operational HP, RMC and Dosimetry groups. The Supervisors for each group had moved to the same office outside the plant and the General Foremen for each group had moved to the same office within the plant. These moves were made to improve communication and coordination within the HP organization. Supervisors and engineers within the HP organization have also attended a Social Skills training program, provided under contract to SCE, to improve interpersonal relations and efficiency.

The position of HP Manager at SONGS has not changed since last reviewed. The recent challenges presented to the HP program from IFPs; see Inspection Reports 50-362/86-37, 50-362/87-13, and 50-362/87-12; initially indicated some weaknesses within the program, see Enforcement Action 87-63. These weaknesses in recent months appear to have been met with concerted action by SCE through the HP Manager to ameliorate the hazards presented and involving significant monetary outlays. These include the acquisition of state of the art equipment for detection and control of IFPs, some of which will be tested at the site for the first time during the upcoming outage; comprehensive particle control procedures; and a commitment voiced to the inspector by the licensee's staff to maintain exemplary control of IFPs during the upcoming outage.

The inspector also interviewed personnel and reviewed records associated with the activities of the Independent Safety Engineering Group (ISEG) and the Onsite Review Committee (OSRC) regarding the fulfillment of commitments specified in TS 6.2.3 and 6.5.1 and their impact on the HP and Chemistry programs. The ISEG was composed of personnel experienced in health physics and apparently well qualified to perform the reviews. The OSRC was composed as required by the TS, it met at the required frequency and records indicated that appropriate items and events were reviewed and action taken.

Organization and management controls at SONGS appeared to meet the requirements of TS Section 6. and Final Safety Analysis Report (FSAR) Chapter 12.

No violations or deviations were identified.

7. Training and Qualification

The inspector reviewed the training program at SONGS as administered by the Nuclear Training Division for general employee training, or "red badge" training as it is designated, and on-the-job training as

administered by the HP organization for contract HP and RMC personnel. The inspector attended red badge retraining during the inspection. The training programs covered by the Institute of Nuclear Power Operations (INPO) accreditation program were not reviewed but it was noted that SONGS had achieved full accreditation for all its programs and the inspector reviewed INPO accreditation team reports from 1985 and 1986. The inspector also reviewed SCE Audit Report AAU-1-X-86 and Field Surveillance Report HP-332-86 which covered areas of the training program. No significant deficiencies were identified in the reports.

The inspector reviewed the Training Program Descriptions for Respirator Training and Basic Radiation Training and Retraining as well as the Training Administrative Guideline for Basic Special Training. The inspector reviewed the Training Records Management System (TRIMS) operation and capabilities and select training records for specific individuals. The inspector interviewed the Nuclear Training Division (NTD) Manager and several of the NTD staff. The inspector was informed that all NTD HP instructors are National Registry of Radiation Protection Technologist (NRRPT) qualified.

The inspector reviewed the newly revised Contract Health Physics Technician Qualification Manual and On-the-Job Training Program for Health Physics Technicians. The inspector was informed by the licensee staff that the Qualification Manual must be complete prior to allowing contract technicians to perform work and that completion of the On-the-Job Training Program was a prerequisite to advancement from assistant to journeyman HP technician status.

The inspector interviewed several operational HP and RMC technicians during plant tours to ascertain their knowledge of health physics and plant procedures. All appeared well informed and cognizant of their duties and responsibilities. The inspector also interviewed five RMC trainees, four of which were contract personnel and one of which was a temporary SCE employee. The trainees expressed an inordinate fear of radiation exposure and an exaggerated perception of the hazard presented by radiation exposure from the comparisons presented in Regulatory Guide 8.29, Instructions Concerning Risks from Occupational Radiation Exposure. Four of the five trainees were women and expressed that they would not want to receive any exposure if they were pregnant because they perceived it as being too hazardous. One of the trainees, when asked what effect she would expect should she receive the 500 millirem maximum recommended during the gestation period if she become pregnant, stated that she would expect the baby to be deformed. The inspector brought these observations to the attention of licensee management at the exit interview and noted that such unjustified fears and exaggerated perceptions of hazard could present significant future liabilities. The inspector also noted that two days of red badge training could not be expected to alleviate doubts and preconceptions acquired over periods of years. The licensee staff noted to the inspector that SONGS has a confidential Health Physics Concerns program and a counseling program for pregnant women and women of reproductive age. These services are available to all employees upon request and are intended to deal with such concerns. The inspector noted that the observation did not appear to indicate a defect in existing programs but may warrant some attention recognizing the large number of

personnel lacking nuclear experience being employed during outage situations.

The training program at SONGS appeared to meet the requirements of TS 6.4 and to comply with the recommendations of ANSI/ANS-3.1-1981, American National Standard for Selection, Qualification and Training of Personnel for Nuclear Power Plants.

No violations or deviations were identified.

8. Occupational Exposures During Extended Outages

The inspector reviewed the planning and preparations being made for the upcoming Unit 2 outage. Discussions with the Outage Management Division (OMD) staff indicated that significant radiological work is being planned including refueling, fuel reconstitution (if necessary), steam generator eddy current testing and (if necessary) repairs, pressurizer design changes, pressurizer nozzle repair, and fuel alignment plate modifications. The OMD staff outlined the methods used to prepare work schedules and generate manning requirements. SONGS employs a computerized system to generate and adjust outage schedules and allocate personnel resources. Input to the schedule is required of the HP organization and the HP Manager reviews and concurs to the final outage schedule. Three people with HP experience are employed by the OMD and are sensitive to HP constraints and considerations. A weekly outage planning meeting is held to track the progress of preparations and allow input from the involved organizations including operational HP, RMC and ALARA. The inspector attended one such meeting during the inspection.

The inspector discussed planning for fuel reconstitution with the Nuclear Fuel Services Group Supervisor. The supervisor stated that extensive preparations had been made to alleviate any potential problems from IFPs to avoid the problems encountered during the last Unit 3 reconstitution effort. These included a trip by a HP engineer to Combustion Engineering's Windsor facilities to survey and decontaminate tooling, installation of a local vacuum system into the fuel pool to remove IFPs generated from the reconstitution area, use of a spraydown system to remove IFPs from tools being removed from the pool, continuous operation of the fuel pool cleanup system and a commitment to control IFPs in the FHB to prevent their spread from the particle control areas. Although high coolant fission product activity indicates that there may be up to 150 failed fuel pins, it was not known at the time of the inspection whether cladding degradation is sufficiently great to result in the introduction of IFPs into Unit 2 systems to the degree found in Unit 3. However, the staff indicated that it will be assumed IFPs are present until it can be demonstrated that they are not and the fuel pool will be sampled during reconstitution to detect step increases in activity and particles in order to ascertain when operations are producing a problem.

The inspector interviewed the newly appointed chairman of the IFP Task Force to ascertain current activities of the group and to evaluate its impact on the Unit 2 outage. The new chairman stated that his goal is to make the program more aggressive and that this will be done by setting a series of goals. Five goals were enumerated for the task force: reduce

the number of personnel contaminations, control IFP zones (termed Zone IIIs by SONGS) so that only the component being worked is potentially contaminated with IFPs, track each IFP to determine its source, control the path from the zone III area to a designated frisking station which has been setup as close as possible to the work area, and continuously brief workers to assure that they are cognizant of IFP control requirements.

The inspector interviewed members of the ALARA engineering group to determine their involvement in planning for the outage. The ALARA staff stated that they had been involved from the beginning in the outage plan and that significant input had been provided. The inspector specifically reviewed the inclusion of ALARA considerations into plans for pressurizer nozzle repair work. Work was progressing on outage exposure estimates but these would not be finalized until shortly before the beginning of the outage. The staff stated that mock-up training will be performed for the steam generator work and for the pressurizer nozzle repair. The technicians for fuel reconstitution will be dedicated to that task, continuous coverage will be provided and the technicians will attend three days of training for reconstitution. The staff stated that two senior station technicians will be assigned to the ALARA group for the outage to provide tailboard briefings, shielding evaluations, special surveys, and process paperwork.

The inspector interviewed the operational HP supervisor and RMC supervisor to determine their involvement in planning for the outage. Both stated that they had been closely involved since the beginning and that they felt that there had been good coordination and cooperation between the various site groups. The HP supervisor stated that a goal of 300 millirem had been established within operational HP as a maximum for involved technicians. Eight crews will be setup for the outage and will remain static on shift. All site technicians had received two days of retraining for the outage and contract technicians will be attending two days of IFP training and completing a qualification manual (see paragraph 7). The RMC supervisor stated that a goal of 3000 cubic feet of waste had been established for the outage. RMC intends to decontaminate some areas inside the Unit 2 containment in order to facilitate access. Contract personnel were being practiced in decontamination methods by cleaning areas of the Radwaste Building during the weeks prior to the outage.

The inspector made several tours of the Radwaste Building, the Safety Equipment Buildings, the Fuel Handling Buildings, and various radioactive material storage and processing areas during the inspection. Housekeeping in these areas appeared good and those areas requiring attention were expeditiously attended to when the inspector brought his observations to the staff's attention. The inspector also observed a number of jobs in progress during the tours and the involved personnel, when questioned, all appeared knowledgeable and cognizant of their responsibilities. Radiation and high radiation areas appeared to be appropriately posted in accordance with the requirements of 10 CFR 20.203 and general area and maximum contact dose rates were specified which corresponded with the readings obtained by the inspector using a model RO-2 ionization chamber, serial number 897, calibrated on 6-25-87 and due

for calibration on 9-25-87. The inspector reviewed select Maintenance Orders, Radiation Exposure Permits (REPs), REP requests, surveys, ALARA reviews, and ALARA Pre-Job Exposure Estimates. All appeared to have been completed in accordance with the applicable site procedure.

The inspector reviewed the current copy of the Radiation Exposure Monitoring Summary (REMS) report on August 19, 1987, at the Unit 2/3 control point and noted that there were entries for two individuals which provided a negative number for their quarterly exposure to date. This was brought to the attention of the Dosimetry staff which investigated the entries. The staff informed the inspector that the negative numbers were a result of corrections being entered into the computerized tracking system to correct MPC-hour exposures from noble gases. The software automatically provides a dose in the individual record which is calculated from noble gas concentrations in the work area but which is no longer required as this exposure is adequately tracked by TLD. Therefore corrections were entered into the record to delete the calculated doses. These corrections were said to have resulted in the negative entries. The staff stated that no other negative entries had been found in the records reviewed. The software involved had not been validated and verified but is due to be in October or November. The licensee has recognized that lack of validation, verification and documentation of computer software can result and has resulted in significant problems and they have an ongoing program to validate, verify and document computer software. The inspector noted that previous negative entries, if they had been missed by licensee reviews of the REMS report, could have been subtracted from subsequent positive entries. This anomaly requires further evaluation and is considered and open item (50-361/87-18-01).

No violations or deviations were identified.

9. Exit Interview

The inspector met with the licensee representatives, denoted in paragraph 1, at the conclusion of the inspection on August 20, 1987. The scope and findings of the inspection were summarized. The licensee was informed that no violations or deviations were identified.