

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-206/88-31, 50-361/88-32 and 50-362/88-34

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: November 28 through December 1, 1988

Inspector: J. E. Russell 12-19-88
J. E. Russell, Radiation Specialist Date Signed

Approved by: H. S. North 12/19/88
H. S. North, Acting Chief Date Signed
Facilities Radiological Protection Section

Summary:

a. Areas Inspected:

This was a routine, unannounced inspection covering the followup of written reports of non-routine events; followup of open and unresolved items; followup of violations and deviations; allegation followup; on-site followup of an event; occupational exposure, shipping and transportation; and transshipment of spent fuel from the Unit 1 fuel pool to the Units 2/3 fuel pools. The inspection included tours of the licensee's facilities. Inspection procedures 30703, 92700, 92701, 92702, 93702, 83750, and 86721 were covered.

b. Results:

In the areas inspected, the licensee's programs appeared adequate to accomplish their safety objectives. Strength was exhibited in the ALARA program and health physics planning for the Unit 1 outage as detailed in paragraph 7.

DETAILS1. Persons ContactedLicensee Personnel

P. Knapp, Health Physics (HP) Manager
M. Wharton, Assistant Technical Manager
J. Fee, Assistant HP Manager, Operations
R. Warnock, Assistant HP Manager, Technical
S. Jones, Quality Assurance (QA) Engineer
C. Couser, Compliance Engineer

All of the above noted individuals were present at the exit interview on December 1, 1988. In addition to the individuals identified, the inspector met and held discussions with other members of the licensee's staff.

2. Followup of Written Reports of Nonroutine Events (92700)

Item 50-206/87-11-L1 (Closed). A spurious actuation of Train "A" of the containment isolation system occurred while removing a recorder due to a broken solder connection which momentarily interrupted power to the instrument. The inspector verified that the broken modules had been replaced and that an appropriate caution statement had been added to procedure S01-II-1.65, Foxboro Single Nest Power Supply Service 2AX-PS9 Calibration. These actions appeared appropriate to prevent recurrence.

Item 50-361/88-04-L1 (Closed). This was a followup, informational report relative to spurious actuation of the Control Room Isolation System (CRIS) due to an electrical spike on a radiation monitor gas channel. The inspector verified that the corrective action to install voltage surge suppressors had been initiated. These actions appeared appropriate to reduce the number of spurious actuations due to electrical noise.

Item 50-361/88-26-L0 (Closed). This event involved a spurious actuation of the CRIS when a technician, performing a radiation monitor surveillance, inadvertently depressed the module power on/off pushbutton. The event was discussed with the technician and, as a result of previous events, keylock bypass swithes were installed on each of the CRIS radiation monitors. These actions appeared appropriate to prevent recurrence.

3. Followup of Licensee Action on Unresolved and Open Items (92701)

Item 50-362/88-26-01 (Open). This unresolved item involved the discovery of several items of radioactive material which were found to have been improperly released from radiological control and were in storage in uncontrolled areas. The inspector was informed that the licensee's investigation into this matter had not been completed at the time of the inspection and that final corrective actions had not been instituted.

Further review of this matter is necessary to determine whether it is a violation, a deviation or an acceptable item.

4. Followup of Licensee Action on Violations and Deviations (92702)

Item 50-362/88-04-02 Violation (Closed). This item involved the failure to provide specific procedures or checklists to assure that a comprehensive system of planned and periodic audits is carried out as required by 10 CFR 71.137. The inspector verified that licensee procedures had been revised to specifically require the completion of audits of transport packages and that an audit, SCES-016-88, had been completed July 27, 1988, which addressed the applicable sections of 10 CFR 71, Subpart H. These actions appeared to have adequately addressed the identified deficiency.

Item 50-361/88-10-16 Deviation (Closed). This item involved the failure of the licensee to operate the Component Cooling Water (CCW) System in accordance with updated Final Safety Analysis Report (FSAR) in that both loops were normally in operation and the letdown heat exchanger was being supplied from a loop which had no radiological monitoring. The inspector verified that the CCW system operating procedure, S023-2-17, had been revised to require single loop operation; that the FSAR would be updated to reflect current practice and that further actions as indicated by the SCE Task Force on Independent Assessment of Engineering and Technical Support would be accomplished. These actions appeared adequate to prevent recurrence.

Item 50-206/88-23-01 Violation (Closed). This item involved the unintentional exposure of a maintenance worker to a whole body dose in excess of the 10 CFR 20.101 (a) limit during the third calendar quarter of 1988. The inspector verified that the corrective actions identified in the licensee's timely response, dated November 14, 1988, had been implemented. Additionally, it was verified that actions to correct the deficiencies identified in the SCE radiation exposure limit extension process, that part of the dosimetry program which implements the exception specified in 10 CFR 20.101 (b), had been initiated. These included the initiation of a specific detailed procedure, S0123-VII-4.1.4: Processing Requests for Radiation Exposure Limit Extensions, and revision of forms SCE HP(123) 312 and 312-A, Radiation Exposure Limit Extension and Radiation Exposure Limit Extension Request, respectively. These actions appeared to adequately address the problems noted.

5. On Site Followup of an Event (Closed) (93702)

At the request of the Senior Resident Inspector, an event involving apparent malicious mischief was reviewed. The event involved an alternate sampling assembly which had been aligned to the Unit 3 Air Ejector when the radiation monitor, 3RT-7870, was out of service for maintenance. On the evening of September 28, 1988, a technician, dispatched to obtain a 12 h noble gas grab sample from the assembly, discovered that the hose from the supply line connection was disconnected and the exhaust hose of the sampler was connected to the sampler inlet.

The technician immediately realigned the sampler properly, obtained the grab sample and made a log entry to document the event. A Technical Division Investigation Report (TDIR), #88-009, was subsequently documented. This investigation revealed that the sampler had been verified to be in the proper alignment on the morning of September 28, when the previous noble gas grab sample had been obtained. The sampler was located in a high traffic area of the Turbine Building which was within the protected area but not in a vital area. Therefore, many hundreds of people would have had access to the location.

All involved technicians and other personnel that had been working in the area during the period in question were interviewed and were unable to supply any information pertinent to the cause of the incident. The investigation concluded that, although malicious mischief could not be ruled out, the most likely cause of the event was the accidental disconnection of the sampler inlet hose and inadvertent reconnection of the exhaust hose by someone unfamiliar with the sampler.

The event appeared to have been appropriately investigated, reviewed and documented and did not appear to be a violation. The inspector had no further questions in this matter.

6. Followup of Allegation RV-88-A-0024 (Closed).

An allegation was received by the Region V office that the Spring 1984 HP sealed source inventory had been intentionally falsified by the omission of a Plutonium (Pu) source at the direction of a licensee management representative. It was further alleged that this same source was disposed improperly, between the time of the inventory and March 1986, by inclusion in a low level waste shipment and that the associated shipping papers omitted the source. Additionally, it was alleged that the disposal of 17 Tritium sources had not been appropriately documented at the time of the Spring 1984 inventory.

The inspector reviewed the records of the HP sealed radioactive source inventories from 1983 to date and the nuclear material custodian's special nuclear material inventories from 1982 to date. The HP inventory is performed in accordance with procedure S0123-VII-9.1.2, Inventory and Leak Testing of Sealed Radioactive Sources, and the nuclear material inventory is performed in accordance with procedure S0123-X-1.6, Special Nuclear Material Inventory. The HP inventory is made to fulfill the requirements of 10 CFR 30 and Unit 1 Technical Specification (TS) 4.12 and Units 2/3 TS 3/4.7.7 for leak testing of sealed sources. The nuclear material inventory is made to comply with 10 CFR 70.51 requirements for special nuclear material inventory and accountability.

10 CFR 30.51, Records, paragraph (a) reads:

"Each person who receives byproduct material pursuant to a license issued pursuant to the regulations in this part and Parts 31 through 35 and 39 of this chapter shall keep records showing the receipt, transfer, and disposal of such byproduct material."

Unit 1 TS 4.12, Miscellaneous Radioactive Material Sources, paragraph A. reads:

"Byproduct material sealed sources which exceed the quantities listed in 10 CFR 30.71, Schedule B, and all other sealed sources containing greater than 0.1 microcuries shall be leak tested in accordance with Specifications B, C and D below.

"Exception: Notwithstanding the periodic leak test required by this specification, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material of (sic) 10 microcuries or less of alpha emitting material."

10 CFR 70.51, Material balance, inventory, and records requirements, paragraph (b) (1) reads:

" Each licensee shall keep records showing the receipt, inventory (including location), disposal, acquisition, and transfer of all special nuclear material in his possession regardless of its origin or method of acquisition."

It is noted that no Pu isotopes are included on Schedule B, 10 CFR 30.71, and that the specified minimum activity of Tritium is 1000 microcuries. Therefore, all Pu sealed sources and all Tritium sealed sources of 1000 microcuries or less are not required to be leak tested by the TS and would not be necessary to the completeness of the HP inventory. However, all Pu sources are required to be included on the nuclear material inventory by 10 CFR 70.51.

A number of discrepancies were identified in these inventories. The November 21, 1983, special nuclear material inventory catalogues 19 Pu sources of various activities and isotopes, 4 of which were startup sources installed in Units 2 & 3. The HP sealed source inventory of May 28, 1983, noted only 1 Pu source.

The November 13 and July 9, 1984, special nuclear material inventories catalogue 20 Pu sources, 4 of which were the installed startup sources and 2 of which were new. These inventories apparently missed a source which was still on-site, Pu-239 #S-2405 of 0.0565 microcuries.

The HP inventory of June 16, 1984, identified 19 Pu sources; none of which were the installed startup sources, 1 of which was the missed source #S-2405 and 2 of which were new sources received in December 1983 and missed on the special nuclear material inventory. This inventory also identified 43 Tritium sources, 11 of which were of sufficient activity to warrant inclusion in accordance with the procedure. The 1983 inventory had identified less than 40 sealed sources.

The November 30, 1984, HP inventory identified only 4 Pu sources, 2 of which were previously identified and 2 of which were new startup sources. It omitted 1 source which was apparently still on-site and 1 source which was apparently disposed. No Tritium sources were identified.

The most currently available HP sealed source inventory, dated May 27, 1988, and special nuclear material inventory, dated October 7, 1988, were also reviewed and were found to catalogue the same 15 sealed Pu sources, with the exception of 4 installed startup sources which were included only on the special nuclear material inventory.

The allegor identified a number of individuals that either allegedly knew of the alleged Pu source or were involved in alleged threats against the allegor. The inspector interviewed all identified individuals that were still employed by SCE and several others that had been at the site or involved with the HP organization and the HP sealed source inventory at the time of the alleged event. No one recalled any coverup of the existence or improper disposal of any Pu or Tritium sources. Indeed, many of the people interviewed recalled that a significant effort had been made by the HP organization in the Spring of 1984 to identify all the sealed sources on site. This recollection is corroborated by the number of sources identified on the June 1984 inventory.

Problems associated with the HP sealed source inventory have previously been identified by the NRC (see Inspection Report 50-206/87-12). Licensee HP personnel have also acknowledged to the inspector that previous sealed source inventories, particularly those during the late construction and early startup phases at Units 2/3 during 1982 and 1983, were inadequate.

The inspector also interviewed the cognizant USNRC Region V Safeguards Inspector that was responsible for special nuclear material inventory inspections at the time of the alleged event. The Safeguards Inspector was aware of no improper inventory or disposal of a Pu source. No evidence of improper disposal of Pu, Tritium or other radioactive material was found during this inspection. Previous problems with the adequacy of HP sealed source inventories appear to have been appropriately addressed and do not warrant additional corrective action at this time. It is possible that some sealed sources could have been disposed improperly but the inspection revealed no evidence that such improper disposal has occurred. Also, except for the discrepancy noted above, the nuclear material inventory appears to be complete and accurate.

The allegation could not be substantiated.

7. Occupational Exposure, Shipping and Transportation (83750)

The inspector reviewed the planning and preparations made for the Unit 1 cycle X refueling outage. Discussions with the HP staff indicated that significant radiological work is planned including refueling, split pin replacement, thermal shield inspection, spent fuel transshipment, Chesterton valve packing modification, pressurizer spray valve overhauls, and nuclear instrument and cabling replacement. Input to the schedule is required of the HP organization and the HP Manager reviews and concurs in the final outage schedule.

The outage began during the course of the inspection with Unit 1 reaching mode 5 on November 29. The inspector attended a daily outage meeting and

noted significant participation by the HP organization. It was noted that Radiation Exposure Permit (REP) issuance is being tracked on the outage schedule to facilitate work planning.

The inspector interviewed the Operational Assistant HP Manager (OAHPM), Unit HP supervisors, HP foremen, various HP technicians and Dosimetry personnel. The inspector reviewed records including select REPs, area and job specific surveys, and daily Radiation Exposure Monitoring Summary (REMS) Reports. Records reviewed covered the period of the inspection. No exposures in excess of 10 CFR 20.101, Radiation dose standards for individuals in restricted areas, limits were noted.

The OAHPM brought to the inspectors attention a change in the HP organization for the outage. The HP organization was designating specific HP supervisors as "customer service representatives," to be available around the clock and to provide a contact point between HP and other organizations for the resolution of problems. The OAHPM felt that this would not only expedite work but would allow line personnel to concentrate more on the safety aspects of work rather than coordination and interfacing tasks. HP manning for the outage appeared to be exceptional with approximately 85 contract and 70 house technicians available. It was also noted that procedure S0123-VII-7.12, Fuel Fragment Exposure and Contamination Control, had been significantly revised. The revised procedure applies to particles with activities greater than 0.01 microcuries and provides an allowance for the omission of respiratory protection in fuel fragment areas and a revised control level of 12 microcurie-minutes (sic) for exposure of personnel inside particle control zones. A representative of HP Engineering stated that this exposure level corresponds to a skin dose of less than 750 mrad to the skin of the whole body and less than 1875 mrad to the skin of the extremity when allowance is made for the shielding provided by protective clothing. The engineer stated that the new level was implemented to simplify the calculations which must be made by the technicians when controlling work.

The inspector interviewed members of the ALARA engineering group to determine their involvement in planning for the outage. The inclusion of ALARA considerations into plans for Chesterton valve packing modification, pressurizer spray valve overhaul and nuclear instrument and cabling replacement were reviewed. An apparently challenging outage exposure goal of 375 person-rem had been adopted as compared to a calculated exposure estimate of 432 person-rem. The staff stated that mock-up training was performed for steam generator work, split pin replacement, Chesterton valve packing modification and nuclear instrument replacement. It was also noted that the letdown regenerative heat exchanger was being chemically decontaminated during the outage to reduce radiation levels around this component and that an ultra-filtration unit had been obtained to cleanup the Unit 1 fuel pool to improve water clarity and reduce contamination levels for the planned pool inspection.

The inspector observed work in the Units 2/3 Radwaste Building and the Unit 1 protected area and noted personnel in the various areas were wearing appropriate personnel dosimetry. Workers interviewed were generally aware of the requirements of their REPs, their personal

exposure totals and limits and the need to perform work such that radiation exposures are as low as reasonably achievable (ALARA).

Radiation and high radiation areas in the various areas toured were posted in accordance with 10 CFR 20.203, Caution signs, labels, signals and controls, and licensee HP procedure S0123-VII-7.4, Posting and Access Control. Independent measurements were made with an Eberline R0-2 ionization chamber, serial number 4042, calibrated on August 31, 1988, and due for calibration on November 31 (sic), 1988.

The licensee seemed to be maintaining their previous level of performance in this area and their program appeared fully capable of accomplishing its safety objectives. No violations or deviations were identified.

8. Transshipment of Spent Unit 1 Fuel (86721)

The inspector discussed planning for and the status of fuel transshipment with the Nuclear Fuel Services Group Supervisor. The supervisor stated that extensive preparations had been completed for the fuel move, including dry runs at Units 2/3, 1 week of classroom training, and dedicated craft and HP support. The work was still on hold at the conclusion of the inspection awaiting the issuance of the last license ammendment necessary for the initiation of work at Unit 1. The inspector attended the On-Site Review Committee transshipment summary meeting, reviewed the transshipment procedure, observed the IF-300 cask which is to be used for the transfers and discussed the transshipment with the responsible HP personnel.

The licensee seemed to be maintaining their previous level of performance in this area and their program appeared adequate to accomplish its safety objectives. No violations or deviations were identified.

9. Exit Interview (30703)

The inspector met with the licensee representatives, denoted in paragraph 1, at the conclusion of the inspection on December 1, 1988. The scope and findings of the inspection were summarized. The inspector noted that the planning for the Unit 1 outage appeared to be comprehensive and that the large amount of planned work presented an uncommon challenge to the licensee to excell in the areas of exposure minimization, contamination control and the timely completion of work.