

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-206/88-23, 50-361/88-24 and 50-362/88-26

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: September 6 through 30, 1988

Inspector:

J. E. Russell
J. E. Russell, Radiation Specialist

10-13-88
Date Signed

Approved by:

H. S. North
H. S. North, Acting Chief
Facilities Radiological Protection Section

10-13-88
Date Signed

Summary:

a. Areas Inspected:

This was a routine, unannounced inspection covering the licensee's followup of open and unresolved items, followup of items of noncompliance, followup of written reports of non-routine events, program for external and internal exposure control, and program for control of radioactive material at Units 1, 2 and 3. The inspection included tours of the licensee's facilities. Inspection procedures 30702, 30703, 92700, 92701, 92702, 83724, 83725, and 83726 were covered.

b. Results:

In the areas inspected, the licensee's programs appeared adequate to accomplish their safety objectives. However, weakness was exhibited in the area of occupational exposure control, and a violation involving an exposure in excess of the quarterly whole body limit was identified, as detailed in paragraph 5. A further weakness was exhibited in the area of radioactive material control, and an attendant unresolved item identified, involving radioactive materials which were found outside the radiologically controlled area, as detailed in paragraph 6.

DETAILS

1. Persons Contacted

Licensee Personnel

H. Morgan, Station Manager
M. Wharton, Assistant Technical Manager
R. Warnock, Assistant Health Physics (HP) Manager
R. Plappert, Compliance Supervisor
J. Scott, Unit 1 HP Supervisor
J. Madigan, Units 2/3 HP Supervisor
S. Brooks, Radioactive Material Control (RMC) General Foreman
S. Jones, Quality Assurance (QA) Engineer
C. Couser, Compliance Engineer

NRC Personnel

A. Hon, Acting Senior Resident Inspector
G. Yuhas, Emergency Preparedness and Radiological Protection Branch Chief

All of the above noted individuals were present at the exit interview on September 30, 1988. In addition to the individuals identified, the inspector met and held discussions with other members of the licensee's staff.

2. Followup of Licensee Action on Written Reports (92700)

Item 50-206/87-10-13 (Closed). A problem was identified, in a special report from the Station Manager, involving excessive corrosion of wide range gas monitor R-1254. The inspector verified that the engineering analysis of the problem was complete and that action had been taken to periodically inspect the monitor to assure that corrosion was not adversely affecting operation. This action appeared appropriate to provide early indication of potential corrosion associated problems.

Item 50-206/88-07-L0 (Closed). This event involved the failure to obtain a sample prior to the release of the contents of a holdup tank. The inspector verified that the event had been reviewed with the cognizant Chemistry personnel and that appropriate changes had been incorporated into procedures S0123-III-5.11.1 and S0123-III-5.11.23 and form CH(123) 5-25 to preclude release without sampling. These actions appeared sufficient to prevent recurrence.

Item 50-361/87-30-L0 (Closed). This event involved the failure to collect and analyze the continuous iodine and particulate samples taken during containment purging. The inspector verified that the event had been reviewed with the cognizant Chemistry personnel and that appropriate changes had been incorporated into lab shift turnover sheets, the sampling procedure and the gaseous release permit procedure. These actions appeared sufficient to prevent recurrence.

Item 50-361/88-06-L0 (Closed). This event involved a spurious Control Room Isolation System actuation due to an electrical spike on the Train B radiation monitor gas channel. Investigation attributed the spike to a momentary disconnect between the instrument rack and radiation monitor module. The inspector verified that the 18 month calibration procedures had been revised to inspect the connectors and assure their proper seating. These actions appeared appropriate to prevent recurrence.

Item 50-361/88-14-L0 (Closed). This event involved the failure to obtain a grab sample after the turbine area sump process monitor was removed from service. The inspector verified that action had been taken to review the event with the cognizant Operations personnel and to institute a design change to provide Control Room indication when a radiation monitor is placed in Alarm Defeat. These actions appeared appropriate to prevent recurrence.

Item 50-361/88-15-L0 (Closed). This event involved inadvertent Fuel Handling Isolation System actuations due to technician error during realignment of an incorrect key-lock bypass switch. The inspector verified that calibration procedures had been revised to include a caution statement and that action to modify the key-lock switches to use unique keys had been initiated. These actions appeared appropriate to prevent recurrence.

Item 50-362/88-06-L0 (Closed). This event involved a Containment Purge Isolation System actuation caused by the transport of a bag of radioactive waste past the monitor due to a miscommunication between the involved Control Operator and HP technician. The inspector verified that the event had been reviewed with Operations and HP personnel and that they had been instructed to obtain and give instrument numbers during such communications. These actions appeared appropriate to prevent recurrence.

Item 50-362/87-01-P1 (Closed). This was a Part 21 report relative to the decertification of lift-lugs on NUPAC cask N-55, certificate of compliance #9070. The inspector verified that there were no shackles on the casks at San Onofre and that the lugs had been marked with the statement "DO NOT USE FOR TIE DOWN." These actions appeared to satisfy the problem identified in the report.

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

Item 50-362/88-04-01 (Closed). This inspector identified item involved the failure of the licensee's procedures to specifically address each of the applicable Subpart H requirements of 10 CFR 71 for execution of the QA program for transport packages. The inspector verified that Topical Quality Assurance Manual chapters 5-G and 8-F and Quality Assurance Procedure N18.04 had been revised to incorporate specific audit requirements for the transportation of greater than type A quantities of radioactive material. These changes appeared to appropriately define the audit program required by 10 CFR 71.

Items 50-206, 361, & 362/IN-88-08 (Closed). The inspector verified that the licensee had received, reviewed and taken action on I & E Information Notice 88-08.

Items 50-206, 361, & 362/IN-88-22 (Closed). The inspector verified that the licensee had received, reviewed and taken action on I & E Information Notice 88-22.

4. Licensee Action on Items of Non-compliance (92702)

Item 50-362/88-04-02 violation (Open). 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 but that the scheduled audit was not due for completion until December 31, 1988. This item will be reviewed further at that time.

5. External and Internal Occupational Exposure Control (83724 & 83725)

a. July 30, 1988, Event at Unit 3

An unresolved item, 50-362/88-21-01, was previously identified involving a maintenance worker knowingly entering a posted high radiation area, while performing a walkdown of a temporary system with an operator, contrary to the requirements of his minor maintenance Radiation Exposure Permit (REP), #00500. The worker received a dose equivalent of 55 mrem during his work in containment on that day, all of which was attributed to his entry into the high radiation area, and this resulted in a cumulative dose of 769 mrem to that point in the third quarter. The worker was reprimanded and sent to retraining. The generic question of worker adherence to and respect for HP requirements was being addressed separately by the Station Manager, at the time of the inspection, and will be reviewed during subsequent inspections. The licensee determined that the event was not reportable.

Technical Specification (TS) 6.12, High Radiation Area, reads in part:

"...Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

- "a. A radiation monitoring device which continuously indicates the radiation dose rate in the area.
- "b. A radiation monitoring device which continuously integrates the radiation dose rate in the areas and alarms when a present (sic) integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate level in the area has been established and personnel have been made knowledgeable of them.

"c. An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the facility Health Physicist in the Radiation Exposure Permit...."

The failure to prevent the entry of the worker to the high radiation area without implementing one or more of the above noted control measures would normally be considered a violation of TS 6.12 and a Notice of Violation issued. However, it was noted that this event was identified by the licensee; that it would be assigned a Severity Level of IV or V; that the licensee determined that the event was not reportable; that it was corrected within a reasonable time and that it could not reasonably have been expected that it should have been prevented by the licensee's actions for previous violations. Therefore, no Notice of Violation is proposed for this violation in accordance with the guidance of 10 CFR 2 Appendix C paragraph V. G. This unresolved item is closed.

b. July 31, 1988, Event at Unit 1

An unresolved item, 50-206/88-20-01, was previously identified involving a maintenance worker, acting as a fire watch, entering posted high radiation areas on the 14' and 22' elevations, contrary to the limitations of his minor maintenance REP, #70250. The workers TLD was read after the event and indicated a dose of 1070 mrem for the month, which, in combination with previous exposure, would provide a quarterly whole body dose of 1166 mrem to that point for the third quarter 1988.

At the initiation of this inspection, the inspector was provided with a Dose Investigation of the event. The investigation stated that the processed thermoluminescent dosimeter (TLD) dose was representative of the highest exposure to which the worker was exposed. Specifically that, among other periods of exposure during the event, the majority of exposure had been received during a period of two hours as the worker leaned against MOV 850B while sitting on its associated piping. A documented survey of the area was provided to the inspector which indicated that the maximum contact dose rate on the MOV and associated pipe was 350 mrem/h and 550 mrem/h on contact with the deck grating. The dose rates at 18" from the pipe and deck grating were 200 and 350 mrem/h, respectively, and at 6' both were 100 mrem/h.

It was postulated in the Dose Investigation that the worker's TLD had "swung to the side (toward)" the valve motor operator, thus subjecting the TLD to the same higher dose rate, 350 mrem/h, as his buttocks in contact with the pipe, which appeared by the investigation to be the area of the whole body which would have received the highest dose.

A review of the worker's written statement and the written statement of a HP technician that performed the survey and a post event investigation; indicated that the worker had been sitting on the deck grating adjacent to the associated MOV piping and not on the piping itself as assumed by the Dose Investigation. The inspector conducted an interview with the involved worker during which he discussed in detail the specifics of his work on the day of the event. The worker confirmed that, as his written statement indicated, he had been sitting on the deck grating leaning on the pipe for about 2h and that, after he stood up, he had noticed a "hot spot" sticker on the pipe which had been next to his hip which read "600 mR/hr." Using the deck grating contact dose rate of 550 mrem/h indicated by the survey performed immediately after the event for the postulated 2h period during which the worker sat next to the pipe and the other times and exposure rates postulated in the Dose Investigation, a theoretical maximum whole body dose from the event was calculated by the inspector to be 1395 mrem.

The inspector's analysis was presented to the Assistant Technical HP Manager and the HP Engineering Supervisor and it was requested that the worker's exposure be reevaluated. This reevaluation had not been completely documented by the close of the inspection but the Assistant HP Manager indicated that it appeared that the worker's third quarter dose, through the time of the event, would be calculated to be approximately 1491 mrem. This exposure would not have been in excess of the 10 CFR 20.101 limit had this been a planned exposure and if a Form NRC-4 or equivalent had been completed.

The inspector reviewed the SCE computer-based dosimetry records and determined that they contained all SONGS related exposures and also calculated the worker's "permissible" [5(N-18)] dose. However, there was no document upon which the worker had signed to certify that the exposure history was correct and complete. The last such signature certification for the worker in question had been obtained on 12 July 1984 when the worker had begun his current tenure at SONGS. Lacking such certification, it was possible that the worker could have accumulated occupational radiation exposure at a facility other than SONGS, from for example a part time job, which had not been included in the dosimetry records.

Additionally, review of the SONGS radiation exposure limit extention system indicated an associated weakness in their Form NRC-4 equivalent. When an exposure in excess of 900 mrem for a quarter or 2500 mrem for the year is planned, a Radiation Exposure Limit Extention Request, form SCE HP(123) 312-A, is completed. The worker is required to sign the back of the request acknowledging that the request is being made and noting on the front page whether the workers lifetime employment radiation exposure involves SONGS only, SONGS and Other Employment, or Other Employment Only. The dosimetry organization then completes a Radiation Exposure Limit Extention, form SCE HP(123) 312, which documents the workers current and lifetime exposures, calculates the permissible [5(N-18)] accumulated dose, and approves the extention. This hard copy form 312 is used

as the equivalent of Form NRC-4 but the worker does not sign this form nor does the worker's signature on form 312-A certify the correctness and completeness of the developed exposure history.

10 CFR 20.101, Radiation dose standards for individuals in restricted areas, reads, in part:

"...except as provided in paragraph (b) of this section, no licensee shall possess, use, or transfer licensed material in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter from radioactive material and other sources of radiation a total occupational dose in excess of the standards specified in the following table:

"REMS PER CALENDAR QUARTER

"1. Whole body; head and trunk; active bloodforming organs; lens of eyes; or gonads..... $1\frac{1}{4}$ "

The failure to limit the involved workers exposure to $1\frac{1}{4}$ rem for the third quarter of 1988 is an apparent violation of 10 CFR 20.101 (50-206/88-23-01).

It was also noted that the failure of the worker to adhere to the requirements of the REP, which prohibited his entry in high radiation areas, and the workers failure to observe and comply with the posting of the high radiation areas are contrary to the requirements of TS 6.8 and 6.12, respectively. The areas were properly posted; the REP appeared specific and correct; and the worker, by his own admission, was aware of the REP requirements, the need to obey radiological postings and his ALARA responsibilities.

10 CFR 20.201 requires that the licensee make or cause to be made such surveys as may be necessary for the licensee to comply with the regulations in this part and are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present. It was noted that the worker in question was in a posted high radiation area for approximately three hours and was never challenged or questioned as to what he was doing there. This was attributed to the lack of other work in the containment at that time and the apparent absence of HP personnel in the area.

Additionally, both the worker's and the technician's statements noted that a high radiation area in excess of 1000 mrem/h, on the 22' elevation of the Unit 1 containment, was not controlled in accordance with the requirements of TS 6.12 in that the flashing lights surrounding the area were found not to be activated on the morning of July 31, 1988. A survey of the area indicated a maximum contact dose rate of 2 R/h. After the event, the plug for the flashing lights was found to be loose and the lights reactivated when the plug was reseated in the socket. This unresolved item is closed.

No Notice of Violation is proposed for the above noted events due to their close temporal proximity to the event of July 30, 1988, which had not allowed sufficient time for corrective action to be instituted.

c. General

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 interviewed the Units 1 & 2/3 HP supervisors, HP foremen, various HP technicians and Dosimetry personnel. The inspector reviewed records including select Radiation Exposure Permits (REPs), area and job specific surveys, and daily Radiation Exposure Monitoring Summary (REMS) Reports. Records reviewed covered the period of the inspection.

The inspector observed work in Unit 1 backyard area and fuel handling building and the Units 2/3 Radwaste, Penetration and Fuel Handling Buildings and noted that personnel in the various areas were properly wearing personal dosimetry and respiratory protective equipment. Workers interviewed were generally aware of the requirements of the REP's under which they were working, 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, hot particle control zones and airborne radioactive material areas in the toured areas 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.

The licensee's performance in this area appeared to be declining but still seemed adequate to accomplishing its safety objectives. One violation was identified.

6. Control of Radioactive Materials

On September 26, 1988, the Acting Senior Resident brought to the inspector's attention the licensee's problems with controlling radioactive material. Several contaminated items had been found outside the radiologically controlled and the protected areas.

Investigation revealed that the problem had initially been identified by the QA organization on August 9, 1988, when an unlabelled, refurbished pressurizer relief valve was found in the "Star Yard," a storage area for non-radioactive material on the owner controlled "mesa" across Interstate 5 from the Station. The approximately 2000 lb valve had been received by SONGS on May 9, 1988, from Wyle Laboratories and the shipping paper indicated that it was contaminated with 93.3 microCuries of activation

products. Records revealed that the valve was promptly returned to controlled storage and an undocumented survey of the area around the valve in the "Star Yard" revealed no further radioactive material or contamination. Further documented surveys of select areas of the "Star Yard" were conducted on September 9 and 15, 1988, and identified no further radioactive material or contamination.

The HP organization considered this an isolated event until the involved QA inspector, during a second survey at the mesa of a warehouse area, identified a contaminated hose, reading approximately 500 counts per minute with an Eberline E-140 with HP-260 frisker probe. The QA inspector traced the hose to the AWS machine shop, a non-radioactive material shop area outside the protected area, where his further survey identified a contaminated lanyard on a safety harness on September 22, 1988, which read approximately 1200 counts per minute. Additionally, on September 23, 1988, a HP technician performing surveys of uncontrolled material leaving the protected area, identified two contaminated items of snubber validation tooling, which read approximately 200 and 2500 counts per minute, respectively. The technician then identified a contaminated item of snubber tooling, which read approximately 200 counts per minute, which was being transported into the protected area from the SCE Westminster Calibration facility. It is noted that the background count rate at the radiologically controlled area boundary can be as high as 150 counts per minute making detection of contamination at the level of 200 counts per minute, found on the hose and on two of the snubber validator, difficult.

The Operational HP organization instituted interim actions to require escalated survey and control measures for materials being removed from the radiologically controlled area on September 23, 1988, as well as beginning a root cause analysis and program revision. The HP organization also began more extensive surveys to assure that no additional radioactive material had been removed from the protected area and that the identified items had not spread contamination in uncontrolled areas. These actions were ongoing at the close of the inspection but a survey of the off-site Westminster calibration facility had been completed on September 27, 1988, and had revealed no further radioactive material or contamination.

The licensee had not completed actions relative to this event by the close of this inspection. Further review of this matter is necessary to determine whether the matter is a violation, a deviation or acceptable. This is considered an unresolved item (50-362/88-26-01).

More generally, during tours of the Unit 1 backyard area, Radwaste Building and Fuel Building and the Units 2/3 Radwaste, Penetration, Safety Equipment, and Fuel Handling Buildings, the inspector noted that radioactive materials were being appropriately controlled and were properly labelled. The inspector interviewed the Units 1 and 2/3 HP supervisors, select HP and RMC technicians and personnel and various plant workers. All seemed knowledgeable of their responsibilities to assure the control of radioactive materials and anxious to correct the deficiencies which resulted in the recent problems.

The licensee's performance in this area appeared to be declining but still seemed adequate to accomplish its safety objectives. One unresolved item was identified.

7. Exit Interview

The inspector met with the licensee representatives, denoted in paragraph 1, at the conclusion of the inspection on September 30, 1988. The scope and findings of the inspection were summarized. The inspector noted that licensee management was taking action to deal with perceived attitudinal problems which might have been a factor in the procedure compliance and high radiation area violations noted in paragraph 4 above. It was noted by the Emergency Preparedness and Radiological Protection Branch Chief, recognizing the number and type of other deficiencies associated with these violations, that the situation might have benefitted from a root cause analysis, such as will be performed for the radioactive material control problems identified in paragraph 5. The Branch Chief also noted that similar radioactive material control problems were identified in 1983 and that the root cause analysis should review the lessons learned from that event.