

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 50-206/80-23

Docket No. 50-206

License No. DPR-13

Safeguards Group _____

Licensee: Southern California Edison Company

2244 Walnut Grove Avenue

Rosemead, California 91770

Facility Name: San Onofre Unit 1 (SONGS-1)

Inspection at: Camp Pendleton, California

Inspection conducted: August 18-22, 1980

Inspectors:

M. Cillis
M. Cillis, Radiation Specialist

29 Sept 1980

Date Signed

J. R. Curtis
R. Curtis, Radiation Specialist

29 Sept 1980

Date Signed

G. P. Yuhas
G. P. Yuhas, Radiation Specialist

9-29-80

Date Signed

Approved By:

F. A. Wenslawski
F. A. Wenslawski, Chief, Reactor Radiation Safety

9/29/80

Date Signed

Section

Approved by:

H. E. Book
H. E. Book, Chief, Fuel Facility and Materials Safety

9/29/80

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Branch

Summary:

Inspection on August 18-22, 1980 - Report No. 50-206/80-23

Areas Inspected: Special unannounced inspection by regional based inspectors to review the radiation protection planning and preparations associated with the impending steam generator repair activity and to review the circumstances surrounding the spill of liquid radioactive waste reported to Region V on August 13, 1980. The inspection involved 70 inspector-hours onsite by three inspectors.

Results: Of the two areas inspection, no items of noncompliance were identified. However, based on the tentative repair schedule and the findings of recent NRC radiation protection inspections a corporate management meeting was schedule for September 5, 1980.

RV Form 219 (2)

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DETAILS

1. Persons Contacted

Licensee Representatives:

*R. Brunet, Superintendent, Unit 1
B. Curtis, Project Manager, Steam Generator Repair Project
*M. Wharton, Supervising Engineer, Unit 1
*J. Tate, Supervisor, Plant Operations
*J. Dunn, Project, QA Supervisor
*R. Rutland, QA
*J. Reilly, Engineer
*F. Briggs, Nuclear Engineer
*J. Mortensen, Health Physics Engineer
*D. Duran, Radiation Protection Engineer
*J. Albers, Chemistry/Radiation Protection Engineer
M. Sullivan, Chemistry/Radiation Protection Engineer
*E. Bennett, Chemistry/Radiation Protection Foreman
*G. Davis, Chemistry/Radiation Protection Foreman

Non Licensee Personnel:

F. Gerrardine, Project Manager, Westinghouse
*W. Allen, (Consultant) Radiation Protection, Steam Generator Repair Project

*Indicates those individuals present to the exit interview.

The following individuals were present at the management meeting held at the NRC Region V office at 10:00 AM, September 5, 1980.

Licensee Representatives:

Dr. L. T. Papay, Vice President, Advanced Engineering, SCE
G. D. Cotton, Vice President, San Diego Gas and Electric
K. P. Baskin, Manager of Nuclear Engineering Safety and Licensing,
Acting Vice President, Nuclear Engineering and Operations, SCE
H. L. Ottoson, Manager, Nuclear Engineering and Safety
J. G. Haynes, Manager, Nuclear Operations
D. E. Nunn, Manager, Quality Assurance
J. M. Curran, Plant Manager, San Onofre
R. V. Warnock, Chemistry and Radiation Protection Supervisor
W. D. Allen, Consultant to SCE

NRC Representatives:

R. H. Engelken, Director, Region V
J. L. Crews, Chief, Reactor Operation and Nuclear Support Branch, RV
F. A. Wenslawski, Chief, Reactor Radiation Safety Section, RV
S. J. Nowicki, Operating Reactor Branch 5, NRR
R. J. Pate, Senior Resident Inspector
A. J. Horn, Reactor Inspector
G. P. Yuhas, Radiation Specialist

2. Steam Generator Repair

a. Background

As a result of extensive examination and testing of steam generator tube integrity the licensee has concluded that it is appropriate to sleeve an estimated 2,500 tubes per steam generator. The licensee estimates that this repair effort may require about 1,000 man-rem.

10 CFR Part 20, "Standards for Protection Against Radiation," states that licensees should make every reasonable effort to maintain exposure to radiation as far below the limits specified in Part 20 as is reasonably achievable. USNRC Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be as low as is Reasonably Achievable", Revision 3, dated June 1978 provides specific information relevant to attaining this objective.

The purpose of this inspection was to determine what actions had been taken, or planned by the licensee to ensure that this repair activity will be accomplished in accordance with the "as low as is reasonably achievable" (ALARA) criteria and in compliance with regulatory requirements.

b. Description of Repair Activity

On August 19, 1980 the inspectors met with licensee, contractor, and consultant representatives to review the planned work and proposed schedule.

The primary coolant channel head of each steam generator is covered with a tenacious layer of oxidized metal which readily retains mixed fission and activated corrosion products. Surveys performed by the licensee indicate gamma radiation dose rates in the range of 4 to 14 rem/hr inside the channel heads.

The first step will be an effort to decontaminate the channel heads. This decontamination will be performed by a contractor using high pressure water borne magentite grit. This exact process has not previously been used for steam generator decontamination. The objective of the process will be to reduce the dose rate in the channel heads by a factor of ten.

The decontamination was expected to begin on September 2, 1980.

A safety evaluation for this process was not available for review during the inspection.

Details of the process had not yet been provided to the licensee such that questions relating to ALARA engineering of the piping and peripheral systems could be answered by the licensee representative.

Utilization of this process is expected to produce about 2,800 gallons of magentite grit containing about 40 curies of activity in an aqueous sludge and several hundred bag type pump prefilters.

This waste is to be processed by solidification in 55 gallon drums. The solidification will be performed by contractors. At the time of the inspection the licensee representatives were not sure of exactly which vendor would be contracted to provide this service. A safety evaluation was therefore not available for review.

Following decontamination, each tube to be sleeved will be honed to provide a clean metal surface to which the sleeve will be affixed. The honing operation will be performed by a contractor.

The licensee was not fully aware of the details of this evolution except to note that the hone will have to be replaced every three tubes and that they expect about 10,000 gallons of liquid waste to be produced. The honing operation was expected to begin about September 10, 1980.

Following honing, the sleeves will be inserted and affixed at the upper end and tube sheet interface. This will be performed by the contractor in the period September 15 thru October 22, 1980. Licensee representatives were unsure of the exact methodology to be used in this stage and therefore could not address specific ALARA questions related to these actions.

Once the tubes are sleeved, nondestructive testing will be performed as the final step in the repair operation.

c. Organization

At the time of this inspection the licensee anticipated that 600 people working for several contractors will be onsite associated with this repair activity.

Integration of this force into the licensee organization had not yet been clearly defined by a written organization chart. Discussion with several licensee representatives indicated that they were unsure as to their degree of responsibility in effecting the radiation protection controls associated with this job. The inspectors noted a tendency on the part of licensee representatives to defer ALARA and radiation protection concerns to consultant and contractor personnel.

d. Procedures

Procedures for the decontamination and various phases of sleeve work had not been received from the contractor for review and approval as of August 22, 1980.

The radiation protection consultant stated that due to the narrow scope of the steam generator work a special, all inclusive, procedure will be established, reviewed and approved that covers all aspects of radiation protection to be implemented for this repair activity.

This special procedure will supercede existing program requirements in some cases. The procedure is under development and is expected to be submitted to licensee management in sufficient time for review prior to the start of decontamination.

e. Training and Qualifications

In order to assure the ALARA criteria is achieved the licensee has recognized the need for considerable specialized training. The inspectors were informed that training is being performed at the contractor facility on the engineering and mechanical aspects of the work. In addition, the contractor intends to ship the steam generator mockup to the site for additional equipment check out and training.

Specialized radiation protection training that includes the areas of instruction required by 10 CFR Part 19 will be developed and implemented for several categories of workers.

This training will include written lesson plans, classroom instruction, on the job training when appropriate, and evaluation and documentation of training effectiveness.

The training will be tailored to suit the needs of personnel in each of the following categories:

1. Licensee personnel involved in the steam generation repair.
2. Contractor radiation protection personnel.
3. Contractors performing the repair activity.
4. Contractors performing waste solidification and packaging.

As of the time of the inspection, training had been provided to 12 of the contractor radiation protection technicians.

Review of the resumes submitted to the licensee to establish compliance with Technical Specification 6.3 "Facility Staff Qualifications" indicated that four individuals did not appear to meet the two year experience requirement expressed in ANSI 18.1-1971 for technicians in responsible positions.

The Supervisor Chemistry and Radiation Protection interviewed each of the 12 technicians to better assess their qualifications in order to exercise selectivity in where their talents could most effectively be used.

f. Exposure Control

Survey records and exposure data provided by the licensee were reviewed to assess what measures would be appropriate for the repair activity.

Survey data for the steam generator channel heads lacked specificity. Dose rate measurements were general in nature and indicated a radiation intensity gradient from 1.2 rem/hr at the manway entrance to 13.7 rem/hr on contact with the tube sheet.

The inspector was informed that individuals entering the channel heads had been provided with a film badge and thermoluminescent dosimeter worn on the chest in close proximity to self reading pocket dosimeters as called for in Radiation Protection Procedure S-VII-1.4 "Entering and Leaving Steam Generators."

The licensee representatives stated that head and extremity monitoring devices were not provided for individuals entering the steam generators. Review of personnel dosimetry records for several individuals who entered the channel heads and received dose in excess of 2 rem as measured by chest dosimetry did not indicate head, lens of the eye, skin, or extremity dose results.

Radiation survey records appear to indicate that the dose to an individuals head may be 20 to 50% greater than the dose to his chest.

The licensee representatives when asked for an evaluation pursuant to 10 CFR 20.201 to demonstrate the appropriateness of personnel monitoring provided to comply with 10 CFR 20.202 and 10 CFR 20.101 indicated that such an evaluation had not been performed.

Radiation Protection Log book entries on July 3 and 6, 1980 and a Radiation/Contamination Survey Data sheet dated July 25, 1980 indicate that a dosimetry evaluation to compare instrument readings verses film badge results as a function of position in the channel heads were initiated. The licensee representative stated that as of the time of the inspection no one had located the film badge results or collated the data in order to complete the evaluation.

The inspector was informed that prior to further personnel entries into the channel head area a survey and evaluation necessary to comply with 10 CFR 20.201 would be completed.

The inspector indicated that failure to perform a survey or evaluation that establishes the appropriateness of the chest worn dosimetry for individuals who were permitted to enter the channel head area during this outage represents potential noncompliance with 10 CFR 20.101, .201 and .202 and will remain unresolved pending a special inspection to review additional survey data to be developed (50-206/80-23-01).

Radiation surveys performed on the platforms surrounding the access to the steam generators indicate whole body dose rates in the range of 50 to 100 mrem/hr. Licensee representatives stated that additional surveys will be performed to determine where temporary shielding can be placed to reduce dose rates in the work area. Temporary shielding had been ordered but had not yet arrived at the site.

The inside surfaces of the channel head are highly contaminated. Smears taken in the "C" steam generator on July 6, 1980 indicated levels of 80 mrad/hr. At the time of the inspection no contamination control enclosures had been placed around the steam generator channel head entrances. Ventilation control consisted of an air eductor which drew air from the channel head to be worked, through the steam generator tubes, out the other channel head, and discharged thru a laundry bag tied to the eductor exhaust. Also, present, but not yet in use, were exhaust ducts equipped with an inline high efficiency filter and blower.

Licensee representatives stated that they were considering improved contamination and airborne activity control measures.

Review of radiation protection survey equipment including equipment ordered but not yet received, indicated a need for the licensee to establish the veracity of this equipment, especially for telemetered dosimetric devices, in terms of the type and intensity of radiation and radioactive materials to be monitored. Air sampling equipment that could be used to measure airborne activity in the channel heads during the performance of work was not readily apparent. Equipment and methods used to collect breathing zone air samples was discussed with licensee representatives.

With the exception a calculation of beta dose to the lens of the eye the licensee had not established the degree of protection provided by anti-contamination clothing for nonpenetrating radiation found in the channel heads.

Facilities for access and egress including personnel contamination surveys were under review by the licensee and measures to improve these areas were being planned.

g. Radwaste

During the current outage an unusually large accumulation of solid radioactive waste developed at the facility. This accumulation was attributed to the lack of a contract with the waste processing vendor and circumstances at the burial grounds.

At the time of the inspection, a contract had been issued to dispose of this accumulation. The waste contractor had a crew of four individuals working six days a week.

The licensee representatives were unsure of the volume, activity and form, of the radioactive waste that will be produced by the repair activity. In the absence of this information, the planning in the radwaste area was in the preliminary stages.

3. Review of Liquid Radwaste Spill

On August 13, 1980 the licensee notified the NRC, Resident Inspector of a potential unmonitored release of liquid radwaste via deck drains from the Component Cooling Heat Exchanger area through the yard drain system to the beach.

Drains from the diked component cooling heat exchanger area can be lined up to discharge to either the Auxiliary Building sump or the yard drain system.

On August 12, 1980 while dewatering spent resins for shipment in accordance with "Procedure for Transferring Resin from the Spent Resin Storage Tank to the Shipping Cask" OIS-3-2.33, approximately 200 gallons of liquid and sludge were discharged into the component cooling heat exchanger dike area.

The inspector reviewed survey records, drainage system plans, dewatering procedures, dewatering system schematic's and two separate investigations reports prepared by the licensee.

This review indicates that the water and sludge was contained within the dike due to a plugged deck drain. This plugged drain, although unplanned, prevented a release to the environment.

Surveys and a visual inspection of the effluent discharge path performed by the licensee concluded with reasonable assurance that an unplanned release to the environment did not occur. The licensee had implemented immediate corrective action to prevent a recurrence of a similar spill.

Although the immediate corrective action appeared to be adequate; the inspector noted that the actual cause for this incident had not been identified by the licensee's investigations. Additional actions taken by the licensee to identify the cause will be examined during a subsequent inspection. (50-206/80-23-02)

4. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the inspection are discussed in Paragraphs 2.f and 3.

5. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on August 22, 1980. The inspector summarized the scope and findings of the inspection.

In addition, the inspector expressed concern that at this stage the licensee's planning did not appear adequate to accomplish the work, as tentatively scheduled, in a manner consistent with the as low as is reasonably achievable dose criteria and in compliance with regulatory requirements.

6. Management Meeting

On September 5, 1980 Region V management met with senior representatives of the Southern California Edison Company (as described in Paragraph 1) to discuss NRC concerns regarding the performance of radiation protection activities at San Onofre Unit 1.

The findings of this inspection and other recent NRC radiation protection inspection findings documented in Inspection Report Nos. 50-206/80-13, 14, 17, 22 and the September 2, 1980 notification made as a result of surveys performed in response to the findings discussed in paragraph 2.f of potential exposures in excess of the regulatory limits were discussed in terms of an apparent deterioration of the radiation protection program.

Licensee representatives presented their immediate and proposed long term corrective action to insure an adequate radiation protection program is implemented.

The licensee's commitments presented at this meeting were confirmed in an Immediate Action letter to the licensee from the regional office on September 5, 1980.