

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Numbers: 50-361/94-01 and 50-362/94-01
Docket Numbers: 50-361 and 50-362
License Numbers: NPF-10 and NPF-15
Licensee: Southern California Edison Company
Irvine Operations Center
23 Parker Street
Irvine, California 92718
Facility Name: San Onofre Units 2 and 3
Inspection Date: January 10 - 14, 1994
Inspector: F. Gee, Reactor Inspector
Approved by: W. P. Ang 1-28-94
W. Ang, Chief Date Signed
Engineering Branch

Inspection Summary:

Inspection during the period of January 10 through 14, 1994
(Report Numbers 50-361/94-01 and 50-362/94-01)

Areas Inspected:

The inspector conducted a routine announced inspection of the San Onofre Units 2 and 3 fire protection and prevention program. The adequacy of the licensee's engineering and technical support of the fire protection and prevention program was also evaluated. The inspector used inspection procedure 64704 as guidance for this inspection.

Results:

General Conclusions and Specific Findings:

The licensee's fire protection program appeared to adequately address measures necessary for the prevention and detection of potential plant fires. Engineering and technical support in this area also appeared to be adequate.

Safety Issues Management System (SIMS) Item:

None.

Significant Safety Matters:

None.

Summary of Violations and Deviations:

None.

Open Items Summary:

None.

Details

1. Persons Contacted

Southern California Edison Company

D. Axline, Engineer, On-site Nuclear Licensing
J. Carnes, Supervisor, Fire Protection Services
C. Couser, Supervisor, Fire Protection
R. Erickson, Site Representative, San Diego Gas & Electric Company
N. Ferris, Engineer, Site Quality Assurance
S. Giannell, Engineer, Fire Protection
D. Herbst, Manager, Site Quality Assurance
M. Hojati, Supervisor, Nuclear Engineering Design Office (NEDO)
H. Jones, Engineer, Station Technical
R. Kowal, Engineer, Fire Protection
R. Moreno, Training Supervisor, Fire Protection Services
B. Pennington, Engineer, Fire Protection
R. Richter, Fire Protection System Design Engineer, NEDO
P. Romero, Engineer, Fire Protection
M. Tolson, Engineer, Fire Protection
W. Zintl, Manager, Site Emergency Preparedness

All of the above personnel attended the exit meeting on January 14, 1994.

The inspector also held discussions with other licensee personnel during the inspection.

2. Fire Protection and Prevention Program (64704)

a. Fire Protection Administrative Procedure Review

The inspector reviewed the licensee's fire protection program procedure controlling the use of ignition sources for technical adequacy and for proper implementation of the fire protection program. The procedures reviewed were S0123-XIII-12, "Control of Ignition Sources," Revision 0, and S0123-I-1.41, "Flame Permit Procedure," Revision 0. The inspector concluded that these procedures appeared to adequately control the use of ignition sources.

b. Surveillance of Fire Hoses

The inspector verified the performance of fire hose surveillance testing as required by Technical Specification Section 4.7.8.3.c.2, which requires hoses to be hydrostatically tested, at least once every three years, at a pressure of 150 psig or at least 50 psig above the maximum fire main operating pressure, whichever is greater. The inspector reviewed the records for the hose surveillance performed in December 1993 as documented on Attachment 8, "Surveillance Data Record Form, 36 Month In-Service Hose Test - Hose Stations," and Attachment 9, "Surveillance Data Record Form, Water Flow Test Outside Units 2 and 3 Containment," of S023-XIII-44, "Fire Hose In-Service Functional Tests." The inspector concluded

that the licensee performed the triennial hose test on the reviewed samples adequately at a pressure of 300 psig. The range of the fire main system pressure ranged from a maximum of 175 psig to an average operating pressure of 140 psig.

c. Walkdown and Review

Section 3.7.8.1 of San Onofre Technical Specifications requires two electric-driven fire pumps and one diesel-driven fire pump with their discharge aligned to the fire suppression header. The same section of the Technical Specifications also requires two separate water supplies, each with a minimum contained volume of 300,000 gallons.

The inspector performed a visual inspection of the fire main system to verify compliance with the above noted Technical Specification requirements. The inspector verified that the discharge of the fire pumps were aligned to the fire suppression header and that the minimum required volume of water was maintained at the storage tanks.

In addition, the inspector also verified that the valve position of three randomly selected sectional valves of the fire main system complied with the applicable piping and instrument diagram flow path.

The inspector also verified that indications at the control room fire protection monitoring panel corresponded with the local indications. Both local and remote level and valve position indications agreed with each other.

In addition to the walkdown, the inspector reviewed the surveillance record of the fire main system, dated February 22, 1993, from Attachment 1, "Annual Fire Suppression System Valve Cycle Surveillance," of surveillance procedure S023-3-3.36.1, "Fire Suppression System Annual Test." The inspector also reviewed the surveillance record, dated December 20, 1993, from Attachment 4, "Fire Water System Flowpath Valve Position Verification," of surveillance procedure S023-3-3.36, "Fire Suppression System Monthly Tests." The surveillance tests appeared to be adequately performed.

d. Adequacy of Engineering and Technical Support in the Fire Protection and Prevention

At San Onofre, engineering and technical support for the plant fire protection and prevention program were provided by three organizations. The Nuclear Engineering Design Office (NEDO) fire protection group was responsible for design and licensing bases. The on-site fire protection engineering group under Site Emergency Preparedness was responsible for surveillance and fire impairments. The on-site Station Technical Group was responsible for the disposition of nonconformances and for equipment performance.

During this inspection, the inspector evaluated the adequacy of engineering and technical support in four areas of the fire protection program: fire barrier penetration seals, smoke clearing for fire containment, fire main system, and disposition of nonconformances.

(1) Fire Barrier Penetration Seals

Section 3.7.9 of San Onofre Technical Specifications requires fire barrier penetration seals separating redundant equipment which could affect the ability to achieve and maintain safe shutdown in the event of a fire to be operable. In response to NRC and industry concerns regarding the adequacy of installed fire barrier penetration seals at nuclear power plants, NEDO initiated a program to evaluate the installed fire barrier penetration seals at San Onofre in 1988.

The licensee documented the evaluation in report M-89032, "Fire Area Boundary Penetration Seal Evaluation Program," dated July, 1988. The inspector reviewed this report for the scope and methodology of the seal evaluation. In the report, the licensee documented the review of seal design, the assessment of construction, installation, and maintenance of seals, and the review of installed seals. The licensee evaluated all identified deviations from the fire endurance test configurations, justified the deviations to be acceptable, and updated documentation to reflect as-built configurations. The inspector concluded that the report was comprehensive and adequate in the evaluation of the fire barrier penetration seals.

At the time of the inspection, the on-site fire protection engineering group under Site Emergency Preparedness was in a 100% reverification program of the installed configuration as a part of the validation of the Plant and Equipment Data Management System (PEDMS) data base. The licensee determined that four of 1500 Technical Specification fire barrier penetration seals inspected did not meet the acceptance criteria of administrative procedure S023-XIII-57, "Eighteen Month Fire Rated Assembly Inspection," and were declared to be inoperable. The acceptance criteria was that minor gaps or separations should not exceed a depth of one inch or a width of 1/8 inch. The licensee had established Technical Specification compensatory measures (fire watches) and initiated maintenance orders to repair the inoperable seals.

The licensee also found 162 drawing discrepancies at the completion of the walkdown of these 1500 seals. These 1500 seals represented a 20% sample of a total of 7000 Technical Specification seals. The reverification process was continuing for the remaining seals at the time of this inspection.

The inspector also reviewed the licensee's penetration seal installation details, S023-411-22-71, for the Units 2 and 3 cable spreading rooms. The inspector reviewed the following: seal material, seal depth, annular gap dimensions, maximum allowable area, seal orientation, combination of penetrating items, and location of installation. The inspector performed a walkdown inspection and verified the adequacy of a sample of the installed fire barrier penetration seals in the Unit 2 cable riser and spreading rooms. The inspector found the sampled seal installations to be in agreement with the design installation details.

(2) Smoke Clearing for Fire Containment

In Section 3.3.4.B of the San Onofre Units 1, 2 & 3 Updated Fire Hazards Analysis, the licensee utilized both fixed ventilation systems and portable fans for smoke removal. The detector interlocks for ventilation fan controls and fusible dampers provided the automatic isolation for smoke containment. Where fire damage to ventilation equipment could occur, the licensee developed a smoke removal plan in the Fire Pre-Plans that removed products of combustion to the exterior environment.

The licensee used three types of portable fans for manual smoke removal: pneumatic, electric, and combustion driven fans. The associated air hoses and ducts were located in a dedicated hose house.

The inspector walked down the hose house, where the air hoses and collapsible ducts for smoke removal fans were stored, and visually inspected a sample of collapsible duct for punctures. The hose house appeared orderly, and the equipment in the hose house appeared to be in good working condition. The inspector also inspected the material condition of the two sixteen-inch electric fans on the fire engine. The material condition of the electric fans on the fire engine appeared to be adequately maintained.

The inspector also reviewed the smoke removal plan in the Fire Pre-Plans for the control room and cable riser and spreading rooms. The information as documented on the smoke removal plan for these areas appeared to be adequate.

The inspector also reviewed the surveillance record of the smoke removal equipment as documented on Attachment 8, "Surveillance Data Record From Monthly Smoke Removal Equipment Inspection," dated December 9, 1993, of S0123-XIII-54, "Monthly Fire Equipment Inspection." The inspector concluded that the licensee performed the monthly smoke removal equipment inspection adequately.

(3) Fire Main System

During this inspection, the inspector evaluated the engineering and technical support for the fire main system by reviewing the maintenance records for the fire pumps.

The inspector reviewed trend data, which were collected by the engineering staff of the Station Technical Group, of the discharge pressure performance of the three (two electric and one diesel driven) fire pumps. The data were derived from the annual operability surveillance of the pumps for the last five years. Based on the analysis of these data, the Station Technical Group concluded that the performance of the fire pumps had been gradually degrading. The Station Technical Group was evaluating options for corrective actions.

The inspector concluded that the engineering staff's monitoring of fire pump performance was adequately performed and that sufficient data points were being monitored for long term performance degradation.

(4) Disposition of Nonconformance Reports

The inspector reviewed the disposition of the following three nonconformance reports (NCRs) by the Station Technical Group:

- NCR 93120021, Diesel Fire Pump Failed to Start for the Weekly Auto-start Surveillance
- NCR 93120040, Diesel Fuel in Crank Case of Diesel Fire Pump
- NCR 93100045, Diesel Fire Pump Failed to Start After Three Cranking Cycles During Annual Surveillance

The licensee initiated timely root cause analysis for these NCRs, and corrective actions were initiated to prevent recurrence. The inspector walked down the diesel fire pump and observed the results of the implementation of the corrective actions. The corrective actions included check valve replacement and ground cable connection modification. The performance of the engineering staff in dispositioning these NCRs appeared to be adequate.

The engineering and technical support in the fire protection areas inspected was adequate. The engineering staff appeared to be knowledgeable in the licensing and operational requirements of the fire protection systems inspected and cognizant of the current equipment status of these fire protection areas.

No violations or deviations of NRC requirements were identified.

3. Exit Meeting

The inspector conducted an exit meeting on January 14, 1994, with members of the licensee staff as indicated in paragraph 1. During the exit meeting, the inspector summarized the scope of the inspection activities and reviewed the inspection findings as described in this report. The licensee acknowledged the inspection findings identified in the report.

The licensee did not identify as proprietary any of the information provided to, or reviewed by, the inspector during this inspection.