UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-8064

February 8, 1999

Harold B. Ray, Executive Vice President
Southern California Edison Co.
San Onofre Nuclear Generating Station
P.O. Box 128
San Clemente, California 92674-0128

SUBJECT: NRC INSPECTION REPORT NO. 50-361/99-02; 50-362/99-02

Dear Mr. Ray:

This refers to the inspection conducted on January 11-15, 1999, at the San Onofre Nuclear Generating Station, Units 2 and 3, facilities. The enclosed report presents the results of this inspection.

The scope of this inspection included review of the implementation of your inservice inspection program for the Unit 2 outage and your planned implementation of the modification to allow the cross-tying of emergency diesel generators between units. During the 5-day period covered by this inspection, your conduct of inservice inspection activities associated with the Unit 2 outage was generally characterized by sound inspection and careful radiological work controls.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room (PDR).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/s/

Dr. Dale A. Powers, Chief
Engineering and Maintenance Branch
Division of Reactor Safety

Docket Nos.: 50-361; 50-362
License Nos.: NPF-10; NPF-15

A/1

Enclosure:
NRC Inspection Report No.
50-361/99-02; 50-362/99-02

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E-Mail report to T. Frye (TJF)
E-Mail report to D. Lange (DJL)
E-Mail report to NRR Event Tracking System (IPAS)
E-Mail report to Document Control Desk (DOCDESK)
E-Mail report to Richard Correira (RPC)

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.:	50-361; 50-362
License Nos.:	NPF-10; NPF-15
Report No.:	50-361/99-02; 50-362/99-02
Licensee:	Southern California Edison Co.
Facility:	San Onofre Nuclear Generating Station, Units 2 and 3
Location:	5000 S. Pacific Coast Hwy. San Clemente, California
Dates:	January 11-15, 1999
Inspector:	John E. Whittemore, Senior Reactor Inspector, Engineering and Maintenance Branch
Approved By:	Dr. Dale A. Powers, Chief, Engineering and Maintenance Branch Division of Reactor Safety

ATTACHMENT: Supplemental Information

EXECUTIVE SUMMARY

San Onofre Nuclear Generating Station, Units 2 and 3
NRC Inspection Report No. 50-361/99-02; 50-362/99-02

This inspection consisted of a review of the licensee's implementation of the facility inservice inspection program and engineering followup review of a previous inspection open item. The inspection report covers a 1-week period onsite by a region-based inspector.

Maintenance

- The inservice inspection examinations were performed in accordance with the applicable procedures. Examination surface preparation was thorough and radiation protection personnel were sensitive to obtaining ALARA conditions for nondestructive examination personnel working in the containment building (Section M1).

- ASME code-governed repair and replacement activities reviewed by the inspector were procured, performed, and tested in accordance with appropriate codes and procedures (Section M1).

- The approved procedures used in the inservice inspection program met ASME code and regulatory requirements. The documentation of inservice inspection activities was in accordance with code requirements. The inservice inspection program schedule included the appropriate examination activities for which relief had been denied by NRC (Section M3).

- Records and documentation indicated that certified nondestructive examination personnel were physically qualified and technically competent to perform assigned inservice inspection activities. The personnel observed performing examination activities were knowledgeable and proficient. The inservice inspection program responsible engineer (coordinator) demonstrated excellent knowledge of ASME Section XI Code requirements, as well as, the content and requirements of the inservice inspection program. The responsible engineer was frequently involved in the observation of field activities (Section M4).

Engineering

- The licensee had performed an appropriate 10 CFR 50.59 evaluation of a highly complicated control system modification that would allow the inter-unit cross-tie of an emergency diesel generator with the same train dead bus on the other unit (Section E8).

Report Details

Summary of Plant Status

Unit 2 was in Mode 6 undergoing refueling, modification, and maintenance. Unit 3 operated at or near full power for the week of the onsite inspection.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Inservice Inspection (73753)

The Unit 2 inservice inspection program was in the second 40-month period of the second 10-year interval, and the current refueling outage was designated as the Unit 2, Cycle 10 outage. The inservice inspection program for both units adopted Section XI of the 1989 Edition of the ASME Code, without addenda. The NRC had denied two of seven requested exemptions to the code requirements for the second 10-year interval.

a. Inspection Scope

The inspector observed the performance of nondestructive examinations on Code Class 1 pipe welds and bolting. Activities associated with code-governed repair and replacement were reviewed and discussed. In addition, the inspector reviewed program plans, schedules, and relief requests.

b. Observations and Findings

The inspector observed the calibration of the portable ultrasonic testing unit that was used to perform angle beam examination of a Class 1, 12-inch, circular pipe weld. The calibration was performed in accordance with the approved procedure using the appropriate calibration blocks.

The inspector also observed the performance of the examinations listed below.

EXAMINATION TYPE	ASME ITEM CATEGORY	SYSTEM AND LOCATION IDENTIFICATION	COMPONENT OR WELD TYPE
Ultrasonic	B9.11	02-17-036	12" Pipe Weld
Liquid Penetrant	B9.11	02-008-001	30" Pipe Weld
Liquid Penetrant	B5.130	02-008-002	30" Pipe Weld
Magnetic Particle	B9.12	02-008-003P	30" Pipe Elbow Longitudinal (BOT)
Magnetic Particle	B9.12	02-008-004P	30" Pipe Elbow Longitudinal (TOP)
Phosphorous Magnetic Particle	B6.30	02-001-056-19	Rx Vessel Closure Stud

The inspector found that the examinations were performed as required by the procedures. The inservice inspection nondestructive examination contractor's procedures had been appropriately reviewed and approved in accordance with the licensee's process for approval of safety-related procedures. The licensee's inservice inspection program responsible engineer (coordinator) accompanied the inspector during five of the six examinations observed. During followup discussions, it was determined that this individual routinely observed nondestructive examination performance in the field.

The examiners did not identify or report any recognizable flaw or discontinuity indications during the six examinations. The inspector observed that examination surfaces had been thoroughly cleaned and prepared by licensee personnel. Generally, it was not necessary for the examiners to perform any additional cleaning or preparation prior to conducting the examinations. The inspector also observed that within the Unit 2 containment building, radiological protection personnel were fully aware of radiological conditions and dose rates where examinations and other tasks were being performed. These personnel made frequent visits to work sites; inquired about dosimeter readings; informed workers of local dose rates and how to attain more favorable radiological conditions; and on occasions of low activity, such as awaiting development of dye-penetrant examinations, requested personnel to relocate to a "cold zone."

The inspector selected and reviewed the code-governed repair and replacement activities listed below. The review consisted of reviewing the work control documentation and discussions with code and welding engineers to understand how code requirements were determined and met for the specific activities.

WORK CONTROL DOCUMENT	ACTIVITY TYPE	ACTIVITY DESCRIPTION
Maint. Order 99010309	Repair	Generic Repair Specification GEN-152, Revision 2, was used to replace load pins in any Unit 2 snubbers and supports that required replacement
Maint. Order 98042040	Replace	Replace two sections of Unit 2 Steam Generator 1 blowdown piping inside the containment where examinations had revealed excessive wall thinning
Maint. Order 98060026	Replace	Replace 2-inch Check Valve S22418(MU)108 in nitrogen gas supply line to Unit 2 safety injection tanks
Maint. Order 96121639	Repair	Perform weld repairs on a through-wall leak and an area below minimum wall thickness on the discharge head of the spare salt water cooling pump

The inspector verified that approved procedures were in place to implement the above repair and replacement tasks. A review of code requirements referenced in the packages indicated that the licensee had invoked the appropriate code sections and articles for procurement, work performance, and post-repair/replacement examinations

for each of the tasks. Discussions with responsible welding and code engineers indicated that these individuals possessed thorough knowledge of the licensee's procedures as well as the applicable requirements in ASME Code Sections III, IX, and XI.

c. Conclusions

The inservice inspection examinations were performed in accordance with the applicable procedures. Also, the inservice inspection program engineer spent sufficient time in the field to verify adequate performance of licensee-contracted nondestructive examination personnel. Examination surface preparation was thorough and radiation protection personnel were sensitive to obtaining ALARA conditions for personnel working in the containment building. ASME code-governed repair and replacement activities reviewed by the inspector were procured, performed, and tested in accordance with appropriate codes and procedures.

M3 Maintenance Procedures and Documentation

a. Inspection Scope (73753)

The inspector reviewed program implementing and performance procedures. Examination reports for the examinations observed and listed in the attachment were also reviewed. Denied relief requests were also reviewed and compared to the current program and inspection plan.

b. Observations and Findings

The inspector found that the licensee's inservice inspection program and implementing procedures referenced in the attachment were clear and concise. The contractor's examination procedures were of sufficient quality to perform and report the inservice inspection examinations with a minimum of interpretation required by the user (examiner). The ultrasonic testing equipment calibration instructions were integral to the ultrasonic examination procedures. The examination procedures had been reviewed and implemented into the licensee's program in accordance with the licensee's process for review, approval, and implementation of safety-related procedures. The inspector also reviewed the final reports of the examinations observed during the inspection. These reports complied with the licensee's procedures, which met code requirements for nondestructive examinations and reporting. Additionally, the inspector reviewed the following NRC-denied relief requests for the licensee's second interval inservice inspection program plan.

RELIEF REQUEST NUMBER	RELIEF REQUEST DESCRIPTION
3.3.5	Requested the NRC to allow personnel not certified in accordance with ASME Section XI Standard SNT-TC-1A to perform VT-3 visual examinations of the two Class 1 pressurizer safety valve bodies while undergoing reconditioning and testing at a vendor's facility, whose noncertified, but experienced personnel would perform the examinations.
3.3.6	Requested NRC approval to forego code-required volumetric and surface examinations for 23 welds on the letdown system regenerative heat exchanger tube sheet, heat exchanger head, and welded integral attachments because of the high radiation dose that would be received by personnel preparing the examination surfaces and performing the examinations.

The inspector verified that ASME code requirements had been included in the current Unit 2 interval plan for the two relief requests that had been denied. The schedule indicated that the code-required examinations of the pressurizer safety valves and the 23 regenerative heat exchanger welds would be conducted over the current and next period of the current interval.

c. Conclusions

The approved procedures used in the inservice inspection program met ASME code and regulatory requirements. The documentation of inservice inspection activities was in accordance with code requirements. The inservice inspection program schedule included the examination activities for which relief had been denied by NRC.

M4 Maintenance Staff Knowledge and Performance

The inspector reviewed copies of the certifications for four licensee-contracted nondestructive examination personnel. These records indicated that the contracted personnel were physically qualified and technically competent to perform the inservice inspection activities they were assigned. Those personnel that performed examination activities observed by the inspector were knowledgeable and proficient. The licensee's inservice inspection program responsible engineer (coordinator) demonstrated excellent knowledge of ASME Section XI Code requirements and the licensee's inservice inspection program requirements. The responsible engineer also demonstrated frequent involvement in the observation of field activities.

III. Engineering

E8 Miscellaneous Engineering Issues

a. Inspector Followup of an Item from a Previous Inspection (92903)

E8.1 (Closed) Unresolved Item 50-361/9613-03: Review of 10 CFR 50.59 Evaluation for Modification to Emergency Diesel Generator Unit Cross-Tie Permissive Circuitry.

Background

NRC inspectors had previously questioned the results of the licensee's 10 CFR 50.59 evaluation of a design modification that would permit electrically cross-tying the Train A Vital 4.16 kV Bus Emergency Diesel Generator from one unit to the Train A 4.16 kV Vital Bus in the other unit. The same modification had been completed for the Train B busses on both units. The licensee desired to implement the modification to gain the capability to provide emergency power to one train of emergency cooling equipment for a unit in blackout conditions requiring core/containment cooling under the provisions of 10 CFR 50.54(x). The licensee had determined that the design change would not result in an unreviewed safety question or involve a change to the Technical Specifications. However, during a previous inspection, NRC inspectors had questioned the licensee's basis for determining that the modification did not increase the likelihood or consequences of the failure of equipment important to safety. Although the licensee had completed installation and overlapping functional testing in both units, the licensee subsequently electrically isolated and bypassed the installation, which rendered the modification functions unusable and all current design functions and requirements were in place. The licensee was attempting to find an acceptable method for implementing the modification and had initiated correspondence with the Office of General Counsel and the Office of Nuclear Reactor Regulation.

Inspection Followup

The inspector reviewed the details of the modification and the 10 CFR 50.59 evaluation performed to support the implementation of the modification without a license amendment. The modification primarily involved the control circuitry for each train of each unit's 4.16 kV vital bus power supply breakers and the associated load sequencing circuitry.

During a loss of offsite power, the licensee currently has the capability to tie the Train A or B diesel generator on either unit to its respective Train A or B bus in the other unit through existing intermediate train bus ties, if the other unit is in a blackout condition. However, this evolution must be performed manually using Desperate Operating Instruction 1E-4160 X-TIE, "Restoration of a 1E 4160V Bus from the Diesel Generator of Opposite Unit," Revision 0. Manual performance involves manually defeating engineered safety features actuation signals, lifting control system leads, and installing electrical jumpers. Licensee representatives stated that the process was time consuming and they estimated that it could take up to one hour to obtain the desired lineup.

The inspector determined that as a result of the modification, the desired lineup for one train could be achieved from the control room within minutes after repositioning two switches from the normal position in each unit. These switches when taken from normal to the "50.54x" position changed the control system to do the following:

- Allow simultaneous closing of the diesel generator output and bus tie breakers on a given Class 1E bus
- Remove loss of voltage or degraded voltage with safety injection signals to permit a tie breaker to be closed on a dead bus
- Block automatic load sequencing on the affected trains of emergency cooling loads in both units
- Initiate appropriate alarms in the control room

The inspector walked down the Class 1E 4.16 kV switchgear rooms and equipment to locate the switches. There were two cross-tie switches located in the train fire protection isolation cabinet, located in each switchgear room, for a total of four switches in each unit. The train fire protection cabinets were normally locked and the keys were controlled by the licensee's normal control system for locked valves, switches, and components. Plant operators did not routinely carry keys that would allow them access to these panels.

The licensee had completed testing on the modifications for both trains of both units. Fully integrated testing was not performed, however, overlap testing of the modification features had been performed and verified that all desired modification features were functional. Furthermore, the testing verified that with the switches in the normal position all design requirements and features were maintained. Surveillance procedures and testing were developed but not implemented to verify the switch positions monthly and to verify the normal accident initiation capability, and the modification-provided functions every refueling outage (24 months). The installed modification was not implemented and was currently disabled in both units through the use of lifted leads and electrical jumpers.

The licensee's safety evaluation reasoned that the redundancy of the switches, the control room alarms on the switches, and the administrative controls for diesel generator cross-tie, precluded the possibility of creating a new accident or increasing the likelihood or consequences of an already reviewed accident from occurring. The licensee planned to implement the modification following the resolution of legal issues regarding the applicability of 10 CFR 50.54(x) for use of the cross-tie.

The adequacy of the 10 CFR 50.59 evaluation was considered acceptable.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on January 15, 1999. The licensee's management acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Bua, Supervisor, Station Technical Services/Chemistry
G. Cook, Supervisor, Nuclear Regulatory Affairs
R. Krieger, Vice-President, Nuclear Generation
W. Lazear, Codes and Welding Engineer, Station Technical Services
A. Mahindrakar, Inservice Inspection Engineer, Site Technical Services
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A. Scherer, Manager, Nuclear Regulatory Affairs
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M. Short, Manager, Site Technical Services
K. Slagle, Manager, Nuclear Oversight Division

NRC

J. Kramer, Resident Inspector, Division of Reactor Projects-E
J. Sloan, Senior Resident Inspector, Division of Reactor Projects-E

OTHERS

C. Thompson, Authorized Nuclear Inservice Inspector, Arkwright Insurance Company

INSPECTION PROCEDURES USED

IP 73753	Inservice Inspection
IP 92903	Followup-Engineering

ITEM CLOSED

Closed

50-361;362/9613-03	URI	Modification to EDG Cross-Tie Permissive Circuitry May Prevent Proper Loading of EDG in an Accident, E.1.5.b.(2)

LIST OF LICENSEE DOCUMENTS REVIEWED

Procedures:

SO123-IN-1	Inservice Inspection Program, Revision 4
SO123-XVII-1	Inservice Inspection Program Implementation, Revision 8
SO23-XXVII-20.28	Ultrasonic Examination of Reactor Vessel Stud Hole Threads, Revision 0
SO23-XXVII-20.47	Magnetic Particle Examination, Revision 1
SO23-XXVII-20.48	Liquid Penetrant Examination, Revision 0
SO23-XXVII-20.49	Visual Examination Procedure to Determine the Condition of Nuclear Parts, Components, or Surfaces, Revision 0
SO23-XXVII-20.55	Ultrasonic Examination of Nuclear Coolant System Austenitic Piping, Revision 3
DOI IE-4160X-TIE	Restoration of 1E 4160V Bus From the Diesel Generator at Opposite Unit, Revision 0

Maintenance Work Orders:

96121639	98042042	98060026
98010021	98051465	90103099

Action Requests:

612009998	960900875	961201400

Nondestructive Examination Reports:

02-17-036	02-008-002	02-008-004P
02-008-001	02-008-003P	02-001-056-19

Miscellaneous:

San Onofre Nuclear Generating Station, Unit 2, Nuclear Inservice Inspection Program, Second 10-Year Interval, dated April 12, 1995

Safety Evaluation Report, Second 10-Year Interval, SONGS Units 2 & 3

Summary, Second 10-Year Interval, SONGS Units 2 & 3

Design Change 7048.OOSE, 10 CFR 50.54(x) Unit to Unit Diesel Generator Cross-Tie

10 CFR Part 50.59 Safety Evaluation for Design Change 7048.OO4