

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 82-04

Docket No. 50-361 License No. CPPR-97-1 Safeguards Group

Licensee: Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, California 91770

Facility Name: San Onofre Nuclear Generating Station Unit 2

Inspection at: San Onofre Site, San Diego County, California

Inspection conducted: December 9, 1981 through January 18, 1982

Inspectors: GB Zwetzig for February 9, 1982
A. E. Chaffee, Senior Resident Inspector Date Signed

GB Zwetzig for February 9, 1982
M. Mendonca, Diablo Canyon Resident Inspector Date Signed

Approved by: GB Zwetzig February 9, 1982
G. Zwetzig, Chief, Reactor Projects Section 1 Date Signed
Reactor Operations Project Branch

Summary:

Inspection on December 9, 1981 through January 18, 1982 (Report No. 50-361/82-04)

Areas Inspected: Routine, unannounced inspection of applicant's preoperational test program, TMI modifications, follow up on IE Bulletin, proposed Technical Specifications, startup procedures, safety committee activities and independent inspection effort. This inspection involved 94 inspection-hours onsite by two NRC inspectors.

Results: Of the seven areas inspected, no items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

- *G. Chavez, Project Startup Supervisor
- *C. Horton, Startup Quality Assurance Supervisor
- *P. Sturdle, Startup Quality Assurance Engineer
- *D. Schone, Project Quality Assurance Supervisor
- *P. King, Project Operations Quality Assurance Supervisor
- *P. Croy, Manager, Configuration Control and Compliance
- *W. Moody, Deputy Station Manager

The inspector also interviewed and talked with other applicant employees during the course of the inspection. These included operators, startup engineers, and Quality Assurance personnel.

*Denotes those persons who attended the exit interview.

2. Plant Status

The applicant reported the Unit 2 construction to be 99 percent complete as of January 13, 1982. The applicant appears to be working for closure of all outstanding low power license items by the first week of February.

3. TMI Modifications

a. TMI Item I.A.1.1 "Shift Technical Advisors" (STA) (Open)

Based on discussions with applicant personnel, the inspector determined that, due to poor STA candidate oral board performance, completion of the qualification process for the five STA candidates will be delayed beyond the previous estimated date of December 2, 1981. At present, the licensee has stated that two of the five candidates have successfully completed their qualification program. The other three are receiving additional training, and it is estimated that final qualification of these candidates will be completed by February 1, 1982. This item will be reviewed after satisfactory qualification of these three candidates.

b. TMI Item I.A.2.1 "Immediate Upgrading of Reactor Operator and Senior Operator Training and Qualifications" (Closed)

The inspector reviewed the following documents pertaining to this item:

Training Memorandum 20-81, "Nuclear Operator Training and Requalification Programs, San Onofre Unit 1 or Units 2 & 3," November 25, 1981

"Nuclear Operating Training and Requalification Program, Units 2/3," San Onofre Nuclear Generating Station

Training Memorandum 19-81, "Operator Requalification Program Units 2 & 3," November 25, 1981

Based on the review of the above and discussions with applicant personnel, the inspector determined the following:

- (1) The Operator Qualification and Requalification Program appears to conform to the requirements of TMI Item I.A.2.1 including the appropriate short range recommendations of the Denton letter of October 28, 1980.
- (2) The Operator Requalification Program must still be submitted to the NRC Operator Licensing Branch (OLB). (The licensee stated that this submittal will be made by January 22, 1981.)
- (3) The Operator Requalification Program has been initiated pending OLB approval.

This item is closed.

c. TMI Item I.A.2.3 "Administration of Training Programs" (Closed)

The inspector reviewed the following documentation applicable to this area:

Training Memorandum 17-81, "Southern California Edison (SCE) Nuclear Training Instructor, Evaluation RO/SRO Training," Revision 1, January 6, 1982

Safety Evaluation Report SONGS 2 and 3, NUREG 0712, Supplement No. 1, pages 22-13 through 22-14

NUREG 0737 "Clarification of TMI Action Plan Requirements"

Based on the above review, discussions with applicant personnel and discussions with a representative of the NRC Operator Licensing Branch, the inspector noted the following:

- (1) The applicant's Instructor Requalification Program appears to conform to NRC requirements.

- (2) The licensee must still submit the Instructor Requalification Program to the Operator Licensing Branch (OLB) for approval prior to issuance of an operating license. (The licensee is in the process of submitting this program.

Unless the OLB requires further revisions to these programs, no further inspection is required. This item is therefore closed.

- d. TMI Item I.C.6 "Guidance on Procedures for Verifying Correct Performance of Operating Activities" (Open)

The inspector reviewed the following documents:

Operating Instruction S023-0-13, "Work Authorizations," Revision 3, November, 1981

Operating Instruction S023-0-23, "Equipment Status Control," Revision 0, December 7, 1981

Operating Instruction S023-0-17, "Locking of Critical Valves and Breakers," Revision 2, October 13, 1981

Operating Instruction S023-0-16, "Abnormal Equipment and Circuits," Revision 2, September 15, 1981

Operating Instruction S023-0-1, "Watch Engineers Responsibilities, Duties and Authority," Revision New, May 19, 1981

Operating Instruction S023-0-19, "Use of Caution and Magnetic Tags," Revision 2, December 15, 1981

Equipment Control Log

Equipment Status Log

Based on the review of the above and discussions with applicant personnel, the inspector noted the following:

- (1) Operating Instruction S023-0-24, "Redundant and Operability Testing Requirements," is not approved. This procedure will define an adequate functional test of redundant systems and systems being returned to operation. This procedure further defines two aspects of the acceptable program referenced in NUREG 0737, namely Section 5.6 of Draft 7 of ANS 3.2.
- (2) The applicant's Equipment Control Procedures do not address the need for considering redundant testing during out of service periods. This item must be considered prior to granting

permission to work on safety-related equipment. This item is included in Draft 7 of ANS 3.2, which is an acceptable program as defined in NUREG 0737.

- (3) The applicant has not yet determined how to implement ALARA considerations into independent verification activities. This consideration is part of the acceptable program in NUREG 0737.
- (4) The method used to document the satisfactory completion of the independent verification of equipment being taken out of service is not clearly addressed in Operating Instruction S023-0-13.
- (5) The applicant has not fully implemented the approved program for this area. For example:
 - (a) Operating Instruction S023-0-23, "Equipment Status Control," is crucial in meeting several of the requirements of I.C.6. However, training on the use of this procedure is incomplete for the 15 Senior Reactor Operator (SRO) candidates. The applicant assured the inspector that prior to return to their regular duties, training in this matter would be given to the SROs.
 - (b) Operating Instruction S023-0-23 has been implemented only on systems turned over to the station. At present, however, several major systems including the Reactor Coolant System, the High Pressure Safety Injection System, the Low Pressure Safety Injection System, and the Chemical and Volume Control System have not been turned over to the station. Thus, a number of major systems are not under the equipment control requirements of this instruction which addresses I.C.6. requirements.
 - (c) Operating Instruction S023-0-23 requires the use of form SO(123)-107, "Work Authorization," to provide the Watch Engineer with a list of authorized work activities for a given day. At present, this system is not in use.
 - (d) Draft 7 of ANS 3.2 which describes an acceptable program to meet the requirements of TMI Item I.C.6 states, "Procedures shall also require that the status of inspections and tests performed upon individual items on the nuclear power plant be indicated by the use of markings such as stamps, tags, labels, routing cards, or other suitable means." The applicant appears to have an adequate procedure to address this matter for plant systems that have been turned over to the station. As noted above, however,

there are a number of major systems that have not yet been turned over to the station. Moreover, there are no administrative means for indicating on the Control Room indicating instruments the operability or turnover status of these systems. Since some of these systems cannot be turned over to the station until testing has been completed during the startup or power ascension phases, means appear to be needed to indicate to the Control Room Operators which systems have not been "turned over." This is necessary so that Operators do not rely on meter indications which may be invalid.

The applicant was informed of the above concerns and is at present taking various forms of corrective action. The applicant has assured the inspector that the problems discussed above will be corrected prior to low power license issuance. The Senior Resident Inspector will continue to monitor this area.

e. TMI Item I.D.1 Control Room Design (Fuel Load Items) (Open)

Based on discussions with applicant personnel and visual inspection of the required modifications, the inspector noted the following:

- (1) The applicant has developed noncontrolled colored drawings which show the Indication Pattern which should exist on the Control Room panels when Engineered Safety Features are actuated. The applicant stated that these drawings are being added to their drawing control system. The applicant also stated that these drawings are referenced for use in the appropriate Emergency Procedures.
- (2) Operator Training on the most basic plant computer manipulation was adequately demonstrated.
- (3) The Core Protection Calculator index is not yet published for operator use.
- (4) Procedure S023-V-4.26, which controls software changes to the plant computer, is not yet published for use.

Items 3 and 4, above, will be reviewed at a future inspection.

f. TMI Item II.B.1.3 Reactor Coolant System Vents (Closed)

The inspector reviewed the following documentation pertaining to this item:

Safety Evaluation Report SONGS 2 & 3, NUREG-0712, Supplement No., 1 pages 22-44 through 22-47

SONGS 2 & 3 FSAR Amendment 23, pages II.B.1-1 through II.B.1-7

Operating Instruction S023-3-1.4, "Filling and Venting the Reactor Coolant System," Revision 3, July 28, 1981

Emergency Operating Instruction S023-3-5.6, "Loss of Coolant Accident," Revision 2, December 7, 1981

Operating Instruction S023-3-2.33, "Reactor Coolant Gas Vent System," Revision New, July 14, 1981

P & I diagram 40111, "Reactor Coolant System"

Operating Instruction S023-3-2.31, "Natural Circulation Guideline," Revision New, August 27, 1981

Based on the above review, visual inspection of the system, and discussions with applicant personnel, the inspector concluded that the applicant appears to have procedures available for operation of this system which conform to applicable requirements. (Note: Per NUREG 0737, use of this system at operating facilities is not presently authorized.)

g. TMI Item II.D.3 "Relief and Safety Valve Indication" (Closed)

(Note: This facility does not utilize power operated relief valves in the Reactor Coolant System.)

The inspector reviewed instrument calibration data sheets covering the various components of the two redundant indicator systems on each code safety, performed a visual inspection of portions of the system, and conducted discussions with applicant personnel. Based on these activities, the inspector determined that this item appears to be complete except for turnover of the system to the station. This turnover will be completed prior to fuel load. This item is closed.

h. TMI Item II.E.4.2 Containment Isolation Dependability (Open)

The inspector reviewed the following documents:

Station Order S023-G-3, "Technical Specification Surveillance Requirements," Revision 1, September 22, 1981

Proposed SONGS 2 Technical Specifications, dated December 14, 1981

Preoperational Test Results, 2 PE-356-04, "ESFAS Power Supply Modification," Revision 1, completed December 8, 1981

Preoperational Test Results, 2PE-356-02, "ESFAS Preoperational Test," Revision 0, completed September 16, 1981

Preoperational Test Results, 2PE-101-04, "Containment Isolation Valves," Revision 0, completed December 4, 1981

Preoperational Test Results, 2PE-357-01, "Plant Protection System," Revision 0, completed November 25, 1981

Preoperational Test Results, 2PE-340-02, "Process Radiation Monitoring System," Revision 0, (in approval)

Operating Surveillance Test S023-3-3.10, "Containment Integrity Verification," Revision 1, June 16, 1981

Operating Procedure S023-1-4.2, "Containment Purge and Recirculation Filtration System," Revision 2, November 17, 1981

Instrument and Test Procedure S023-II-1.1, "Reactor Plant Protection System Testing," Revision new, September 27, 1979

Preoperational Test Results, 2PE-455-01, "Verification of Load Group Assignments (Class IE)"

Operating Surveillance Test S023-3-3.26, "Once a Day Surveillance (Modes 1-4)," Revision 0, June 30, 1981

Based on the above review and discussions with applicant personnel, the inspector noted the following:

- (1) The completion of Preoperational Tests 2PE-356-04, 2PE-356-02, 2PE-101-04, and 2PE-356-01 demonstrated that containment isolation was initiated by diverse parameters.
- (2) Preoperational Test 2PE-101-04, "Containment Isolation Valves," demonstrated the operability of the Containment Isolation System. However, several of the containment isolation valves did not meet the FSAR acceptance criteria for closure times. The applicant performed an engineering evaluation and concluded that the acceptance criteria for closure times could be increased. The new closure time criteria were submitted to the NRC as Amendment 27 to the FSAR.
- (3) The applicant completed a modified form of Preoperational Procedure 2PE-455-01, "Verification of Load Group Assignments (Class IE)," to assure that components of the Engineered Safety Features (ESF) Systems did not change position upon

resetting the actuation signal. This also demonstrated that containment isolation valves will not reopen when the actuation signal is reset as required by this TMI item.

- (4) The containment high pressure setpoint is set at 2.95 psig in step 8.6.16.12 of 2PE-357-01, Revision 0, which was completed on November 25, 1981. This value is less than 4 psig, which is the nominal value stated in SER Supplement No. 1, NUREG 0712. The value appears acceptable, however, because it is conservative and includes allowance for instrument drift.
- (5) Procedure S023-1-4.2 requires the containment purge valves to be shut and power removed from their operators when the reactor is in Modes 1-4. This condition is required to be checked monthly by Procedure S023-3-3.10. However, Procedure S023-3-3.26, "Once A Day Surveillance (Modes 1-4)," does not require a visual check of the valve position lights daily as required by proposed Technical Specification 4.6.1.7.1.a.
- (6) Preoperational Procedure 2PE-101-04, "Containment Isolation Valves," completed December 4, 1981, and Section 8.32 of 2PE-340-02, "Process Radiation Monitoring System," completed prior to January 1, 1982, demonstrated that containment purge valves close on a high radiation signal.

Item 5 will be inspected at a future inspection.

i. TMI Item II.F.1 Additional Accident Monitoring Instrumentation (Open)

(1) Containment Pressure Monitor (Closed)

The inspector reviewed the following documents pertaining to this item:

Design Change Package 28-J

Instrumentation and Control Loop Verification Data Sheets

Based on the above review, discussions with applicant personnel, and visual inspection, the inspector concluded that the containment pressure monitoring and recording system conforms to the applicant's commitment and to the Safety Evaluation Report discussion which reflects NUREG 0737 requirements.

(2) Containment Water Level Monitor (Closed)

The inspector reviewed the following documents.

Design Change Package 23-J, "Containment Water Level Indication Upgrade per TMI," Revision 3

Instrumentation and Control Loop Verification Data Sheets

NUREG 0712, Supplement 1, "Safety Evaluation Report SONGS 2 and 3.

NUREG 0737, Clarification of TMI Action Plan Requirements

Design Change Package 51-J, "Containment Normal Sump Level Instrumentation Upgrade," Revision 1

Based on the above review, discussions with applicant personnel, and a visual inspection of portions of this system, the inspector concluded that the applicant's containment water level system appears to conform to the applicable requirements.

(3) Containment Hydrogen Monitor (Open)

The inspector reviewed the following documents:

Safety Evaluation Report SONGS 2 and 3, NUREG 0712, Supplement 1

NUREG 0737, Clarification of TMI Action Plan Requirements

Design Change Package 50-J

Based on the above review, discussions with applicant personnel, and a visual inspection of portions of this system, the inspector concluded that the licensee's containment hydrogen monitoring system appears to conform to the applicable requirements with the following exceptions:

- (a) The operability of both H₂ Channels has not yet been demonstrated.
- (b) The H₂ concentration recorder is not operable.

This item will be reviewed at a future inspection.

j. TMI Item II.F.2.1 and .2 "Instrumentation for Detection of Inadequate Core Cooling" (Closed)

The inspector reviewed the following documentation in this area:

NUREG 0737, "Clarification of TMI Action Plan Requirements"

NUREG 0712, Supplement No. 1, "Safety Evaluation Report
SONGS 2 & 3," pages 22-99 through 22-110

NUREG 0712, Supplement No. 2, "Safety Evaluation Report
SONGS 2 & 3," pages 22-25 through 22-29

Preoperational Procedure 2ST-211-04, "Subcooling Margin Monitor,"
Revision 0, completed December 15, 1981

Emergency Operating Instruction (EOI) S023-3-2.30, "Determination
of Adequate Core Cooling," Revision 2, July 28, 1981

Based on the above review, visual inspection, and discussions
with applicant personnel, the inspector noted the following:

- (1) Work on the subcooling margin monitor is complete with the
exception of follow-up testing which requires the plant be
at power.
- (2) Procedure S023-2.30, "Determination of Adequate Core Cooling,"
appears to fulfill the procedure requirements of this item.
- (3) The core exit thermocouples interim system which is required
for fuel load appears to be complete.

Subitems 1 and 2 of this item are closed.

No items of noncompliance or deviations were identified in the area
of TMI Action Items.

4. Follow up on IE Bulletins

IEB 80-06 "Engineered Safety Feature (ESF) Reset Controls" (Open)

The inspector reviewed the following documentation in this area:

Amendment 27 to SONGS 2 and 3 FSAR, pages Q & R 15.0-19

Deficiency Evaluation Report 102

Preoperational Test 2PE-455-01, "Verification of Load Group Assignments
(IE)," as modified for use in addressing IEB 80-06 concerns, completed
September 1, 1981

Operating Instruction S023-3-2.7, "Safety Injection System Operation"

Based on the above review and discussions with applicant personnel, the inspector noted that the licensee had conducted the required test and document review. This resulted in the identification of 18 components which, under test conditions, repositioned upon resetting of an actuation signal. The disposition of these components is as follows:

- a. Under conditions of a realistic accident scenario, it was found that nine of the 18 components would be prevented from repositioning by existing procedures.
- b. Eight components were found which would reposition but the repositioning would have no negative impact. The applicant has stated these components work as designed and no modifications are planned.
- c. The last component is the Volume Control Tank outlet valve LV-0217 which repositions on ESFAS reset. This was determined to be unacceptable. Repositioning of this valve will be prevented on an interim basis by revising Operating Instruction S023-3-2.7, "Safety Injection System Operation." Further corrective action on this item will be implemented at the first refueling outage. At that time, circuit modifications will be completed to prevent repositioning upon ESFAS reset. Supplement 4 to NUREG 0712 (when published) will require "caution statements" in the appropriate emergency procedures to alert the operator to the ESF components identified above which may be expected to reposition on ESF reset. At present, the applicant is reviewing the status of completion of incorporation of these caution statements in the appropriate emergency procedures.

An additional item of concern resulted from the applicant's performance of Preoperational Procedure 2PE-455-01. This concern was the automatic loading of the non-Class 1E backup pressurizer heaters onto a 1E bus upon ESF reset. This response appears to conflict with the requirements of TMI Item II.E.3.1, "Emergency Power Supply for Pressurizer Heaters," which states:

- "(4) Any changeover of the heaters from normal offsite power to emergency onsite power is to be accomplished manually in the control room.
- (5) In establishing procedure to manually load the pressurizer heaters onto the emergency power sources, careful consideration must be given to:
 - (a) which ESF loads may be appropriately shed for a given situation;
 - (b) reset of the safety injection actuation signal to permit the operation of the heaters; and

- (c) instrumentation and criteria for operator use to prevent overloading a diesel generator.
- (6) The Class 1E interfaces for main power and control power are to be protected by safety-grade circuit breakers (see also Regulatory Guide 1.75).
- (7) Being non-Class 1E loads, the pressurizer heaters must be automatically shed from the emergency power sources upon the occurrence of a safety injection actuation signal (see item 5.b. above)."

This item is presently being reviewed by the applicant. The above items will be examined at a future inspection.

No items of noncompliance or deviations were identified.

5. Safety Committee Activities (Open)

Based on discussions with applicant personnel, the inspector determined that procedure revisions necessitated by recent significant changes in the proposed Technical Specifications were progressing. The procedures, however, have not yet been reviewed and approved by the Onsite Review Committee.

These procedures are scheduled to be reviewed and approved in the near future and will be inspected after approval.

6. Technical Specification Review (Open)

The inspector reviewed the initial proof and review copy of the proposed Technical Specifications for Units 2 and 3, and forwarded comments on that document to NRR by memorandum dated November 18, 1981. Subsequently, several revisions to the initial proof and review copy have been incorporated. These revisions appear to include response to the comments made in the above memorandum. In addition, the licensee is aware that the Topical Quality Assurance Report for Units 2 and 3 will need to be updated in its final form to be consistent with the as-issued Technical Specifications. Pending finalization of the Technical Specifications, this item remains open.

No items of noncompliance or deviations were identified.

7. Startup Test Procedures

The inspector reviewed the following startup test procedures:

2HB-316-01, Revision 0, "CEDM Tests," November 23, 1981

2 FL-101-01, Revision 1, "Initial Fuel Load," November 10, 1981

2 HA-212-04, Revision 0, "Pressurizer Performance," December 18, 1981

2 HB-313-01, Revision 0, "Pressurizer Spray Valve and Control Adjustment," September 16, 1981

2AC-211-03, Revision 0, "Pressurizer Pressure and Level Control," January 1, 1981

Based on the above review and discussions with applicant personnel, the inspector concluded that these procedures appeared to conform to the applicable requirements.

No items of noncompliance or deviations were identified.

8. Plant Tour

The inspector conducted several tours of the plant and noted the following:

a. Housekeeping

Varying amounts of dust and debris were observed in various locations around the plant, including inside containment. The inspector stated to the applicant that cleanliness inside containment should be upgraded prior to fuel loading. The applicant acknowledged this observation and stated that the equipment hatch recently had been shut and this marked the commencement of increased efforts to clean up the containment.

b. Fire Equipment

The inspector observed no apparent discrepancies in the condition of fire fighting equipment. (Note: The total fire protection system is not yet fully operational.)

c. Communications

The inspector observed no unidentified dead spots in the public address system coverage in the Unit 2 area.

No items of noncompliance or deviations were identified.

9. Independent Inspection Effort

The inspector noted that the operating staff relies on uncontrolled mylar "washed out" drawings, located in the Control Room, to establish the proper alignment of vent and drain valves when preparing clearances for equipment. In addition, these drawings are used by the operator

to verify the adequacy of other approved procedures (e.g., hydro tests). The inspector noted that no controlled drawings showing vent and drain valves exist, at present, in the Control Room. The inspector expressed concern that the use of these uncontrolled drawings in connection with activities affecting quality, may have a negative impact on these activities. The licensee concurred and committed to develop controlled versions of these documents by about April 21, 1982. In the interim, the operators will be cautioned not to rely on these drawings for controlling activities affecting quality. The operators will use these drawings only as a convenient backup check and to facilitate the use of controlled isometric drawings when needed and as available in the Control Room. The controlled isometric drawings are not normally used by the operators due to the large number of drawings, which makes their use very cumbersome. (NOTE: The isometric drawings do include all vent and drain valves.) This item will be reviewed at a future inspection (OI82-04-01).

No items of noncompliance or deviations were identified.

10. Exit Interview

The inspector met with the applicant's representatives (denoted in Paragraph 1) at the conclusion of the inspection on January 18, 1982. The results of the inspection were reviewed.