

U.S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-206/88-11  
Docket Nos. 50-206  
License Nos. DPR-13  
Licensee: Southern California Edison Company  
P. O. Box 800, 2244 Walnut Grove Avenue  
Rosemead, California 92770  
Facility Name: San Onofre Unit 1  
Meeting Location: Region V, Walnut Creek, California  
Meeting Date: March 24, 1988

Prepared by: *F. R. Huey* for 3/29/88  
F. R. Huey, Senior Resident Date Signed  
Inspector, Units 1, 2 and 3

Approved By: *P. H. Johnson* for 3/29/88  
P. H. Johnson, Chief Date Signed  
Reactor Projects Section 3

Meeting Summary

Management Meeting on March 24, 1988 (Report No. 50-206/88-11)

A management meeting was held in the Region V office on March 24, 1988 to discuss recently identified environmental qualification concerns related to Unit 1. Southern California Edison's plans relating to transshipment of spent fuel from Unit 1 to Unit 2 were also discussed.

## DETAILS

### 1. Meeting Participants

#### Nuclear Regulatory Commission

J. B. Martin, Regional Administrator  
D. F. Kirsch, Director, Division of Reactor Safety and Projects  
G. W. Knighton, Director, Project Directorate V, NRR  
A. E. Chaffee, Deputy Director, Division of Reactor Safety and Projects  
R. P. Zimmerman, Chief, Reactor Projects Branch  
P. H. Johnson, Chief, Reactor Projects Section 3  
G. P. Yuhas, Chief, Facilities Radiological Protection Section  
F. R. Huey, Senior Resident Inspector, San Onofre

#### Southern California Edison Company

C. B. McCarthy, Jr., Vice President and Site Manager  
K. P. Baskin, Vice President, Nuclear Engineering, Safety and Licensing  
M. O. Medford, Manager, Nuclear Engineering and Licensing  
D. F. Pilmer, Manager, Nuclear Engineering  
J. T. Reilly, Station Technical Manager

#### San Diego Gas and Electric Company

R. Lacey, Manager of Nuclear Department

### 2. Management Discussion

A management meeting was held on March 24, 1988, at the Region V office in Walnut Creek, California. The primary purpose of the meeting was to discuss recently identified concerns associated with environmental qualification (EQ) of Unit 1 safety related equipment. A copy of the meeting agenda is included as Attachment 1. Current efforts associated with transfer of Unit 1 spent fuel and plugging of Unit 1 steam generator tubes were also discussed at the meeting.

#### a. Environmental Qualification Concerns

Mr. Martin opened the discussion by noting that a previous management meeting held on December 15, 1987, had addressed NRC concerns regarding indicated weaknesses in engineering and technical work at San Onofre. He noted that the recently identified EQ deficiencies had further illustrated that concern and asked SCE to review the actions they have taken in this regard.

Mr. Baskin acknowledged that SCE was treating this matter as a serious breakdown of engineering controls associated with the Unit 1 EQ program and he and other members of the SCE staff proceeded to describe the actions being taken to define and correct the problems. A copy of the summary information presented to meeting participants is enclosed as Attachment 2.

## Scope of Problem and Operability Considerations

Mr. Pilmer stated that SCE had initiated a comprehensive task force evaluation of Unit 1 EQ program implementation in response to the EQ discrepancies identified by Mr. Huey and SCE QA. He stated that the approach taken by the task force was to compile a list of all electrical components located within the postulated harsh environment (i.e., which would be affected by a steam line break), and then eliminate those which did not need to be or were already included within the scope of the EQ program. Approximately 1000 candidate components had been screened to date, resulting in the identification of 50 specific components which had not been properly included on the licensee's EQ program master list. These components involve four different safety related systems, as described below:

### (1) Safety Injection System

A total of 26 components were identified as not being properly included on the master EQ list. Of these, the licensee determined that 22 components required modification to comply with EQ requirements and 4 were qualifiable without modification.

During the discussion it was noted that EQ is a concern for the safety injection (main feedwater) system only in the event of a main steam line break. In that case, safety injection is required only for boron injection, to ensure that proper shutdown margin is maintained following the postulated steam line break. Licensee representatives stated that, due to the small magnitude of the temperature coefficient, safety injection has not to date been required to mitigate the consequences of a main steam line break accident. Boration will, however, be required during the latter part of the present operating cycle. The justification for continued operation provided with the 1987 single failure analysis therefore bounds any EQ deficiencies which have to date been associated with the safety injection system.

Mr. Huey noted that the compensatory measures implemented by the licensee in conjunction with the single failure analysis provide for operation of valve HV-851 with flow through the valve. He further noted that the licensee had committed to resolve concerns associated with the ability of this valve to perform as intended prior to Unit 1 restart from the current outage.

### (2) Auxiliary Feedwater (AFW) System

A total of three components were identified as not being properly included on the master EQ list. Of these, the licensee determined that one component required modification to comply with EQ requirements and two were qualifiable without modification.

The unqualified AFW pump bearing cooling water valve (SV-135) could have impacted operability of the motor-driven AFW pump.

### (3) Charging and Recirculation Systems

A total of 18 components were identified as not being properly included on the master EQ list. Of these, the licensee determined that 12 components required modification to comply with EQ requirements and 6 were qualifiable without modification.

Only 2 unqualified non safety related components associated with the charging and recirculation systems could impact operability of the recirculation pumps (G45A & B) from an electrical interaction standpoint. The remaining 10 unqualified components are affected by radiation environment only (e.g., less likely to fail).

### (4) Post Accident Sampling System

A total of three components were identified as not being properly included on the master EQ list. Of these, the licensee determined that two components required modification to comply with EQ requirements and one was qualifiable without modification.

The licensee noted that the post accident sampling system serves no safety function, but serves to provide indication of post-accident conditions.

### Root Cause of Current EQ Discrepancies

The licensee stated that the root cause evaluation of this problem was continuing and that the results of this review would be documented in a licensee event report later this month. However, based on review to date, the licensee believed the reasons for the EQ program breakdown to fall into four different categories:

#### (1) Equipment installed between creation of the EQ lists in 1981 and establishment of EQ design controls in 1984

The licensee noted that 10 improperly qualified components in the auxiliary feedwater, safety injection, post accident sampling and recirculation systems appeared to fall into this category.

The licensee also acknowledged that an apparent failure to properly perform a comprehensive reassessment of EQ program implementation in 1984 contributed to this problem.

#### (2) Equipment affected by redefined safety function

The licensee identified 10 improperly qualified components in the safety injection system as falling into this category.

The licensee again acknowledged that a failure to perform a comprehensive reassessment of EQ program implementation in 1984 contributed to this problem.

- (3) Equipment which supports safety-related systems but was missed for lack of in-depth review

The licensee noted that 14 improperly qualified components in the auxiliary feedwater and charging systems fell into this category.

- (4) Equipment having potential for electrical interaction due to associated circuitry

The licensee identified 14 improperly qualified components in the safety injection and recirculation systems as falling into this category. The licensee also noted that a comprehensive evaluation of associated circuitry electrical interactions does not appear to have been performed before. In initially implementing the EQ program, the licensee relied on electrical interaction reviews performed for fire protection and other ongoing efforts, and it appears that these reviews were not sufficiently thorough to assure proper EQ of electrical components.

The licensee noted that two safety injection system components were also found to be of concern from other than the standpoint of potential electrical failure. These involved a lube oil cooler for the main feedwater pumps which would not appear to function properly in a steam environment, and pump motor air filters which were improperly replaced during maintenance operations with unqualified filters.

#### Corrective Actions being Implemented

Licensee representatives stated that the following actions were being taken to correct the identified EQ problems:

- (1) All safety related components within harsh environment areas are being reevaluated for proper environmental qualification (pursuant to 10 CFR 50.49(b)(1)) and will be properly qualified and controlled by the EQ program prior to Unit 1 restart from the current outage. Any exceptions will be covered by approved justifications for continued operation.
- (2) All non-safety related components within potentially harsh environment areas are being reevaluated (pursuant to 10 CFR 50.49.(b)(2)) for possible electrical interaction which (in the event of failure) could adversely affect safety related equipment. This effort will be completed by August 31, 1988.

Mr. Martin expressed concern with regard to SCE's plan to proceed with Unit 1 restart from the current outage without completing a thorough review of electrical interactions, as required by 10 CFR 50.49(b)(2). He noted that several of the EQ problems already identified involve (b)(2) type electrical interactions and since SCE has never performed a comprehensive review of this area, the licensee does not appear to have a sound basis for proceeding as

planned. Mr. Martin stated that SCE should reassess this concern and provide additional justification for restarting the unit before the review is completed.

Mr. Baskin stated that the (b)(2) review was a major effort involving 4 - 6 man-years of effort by skilled engineers, and requiring review of perhaps a thousand electrical drawings. He noted that it would be difficult to complete the review much sooner. The possibility of prioritizing the review was briefly discussed, and licensee representatives stated that additional actions would be taken or justification would be provided for restarting Unit 1 before completing the (b)(2) review.

- (3) Mr. Pilmer stated that design controls implemented in 1984 are expected to prevent recurrence of the types of deficiencies found during this review. Since these types of controls have been continuously in place for Units 2 and 3, he stated that he does not believe similar problems to exist on these units.

Mr. Huey noted that the licensee's Topical Quality Assurance Manual for Unit 1 does not appear to adequately address environmental qualification requirements and requested that the licensee address this concern.

Mr. Johnson noted that SCE had not previously certified to the NRC that Unit 1 met the EQ requirements of 10 CFR 50.49. He requested that the licensee provide a clear certification to this effect (excepting those items for which specific JCOS have been provided) in the forthcoming LER or other appropriate correspondence.

b. Transshipment of Unit 1 Fuel to Units 2/3

Following the discussion of Unit 1 environmental qualification concerns, the licensee briefly discussed efforts associated with the transfer of Unit 1 spent fuel to Units 2/3.

Mr. Martin expressed concern that ongoing efforts associated with the transfer of Unit 1 spent fuel appeared to involve significant disagreements between licensee and NRC personnel regarding whether the action could be accomplished without an amendment to the Unit 1 license. He noted that, although SCE was considering fuel transfer operations as early as the following week, a 10 CFR 50.59 evaluation had not yet been completed by the licensee, and that it also was not clear that the activity could be accomplished pursuant to 50.59.

Mr. Medford reviewed the background of the fuel transshipment issue, noting that:

- \* Storage of Unit 1 spent fuel in the Unit 2/3 fuel pools was addressed during the initial licensing reviews for these units, although (perhaps inadvertently) it was not specifically included in their Technical Specifications.

- \* The transfer was needed to make room in the Unit 1 spent fuel pool for a complete core offload during the 1989 or 90 refueling for inservice inspection. Complete unloading of the core could also be necessary during the 1988 refueling if unexpected problems should be encountered.
- \* The heavy lift program pursuant to NUREG-0612 has been approved by the NRC for implementation at San Onofre. SCE believes that this serves as a basis for proceeding under 50.59, in that 0612 gives steps to follow for loads different from those covered by the initial review. The NUREG authorizes lifts up to the crane capacity so long as weight limits, surveillance tests, and other requirements are satisfied.

Mr. Knighton disagreed with SCE's position, in that NRR considers license amendments to be required for Unit 1 and Units 2/3 to permit the transfer. He stated that a Technical Specifications change was under review for Units 2 and 3, but that it involved technical considerations, not just administrative matters. Mr. Knighton stated that a Unit 1 licensee amendment is also required pursuant to 50.59 in that the fuel transfer involves safety questions (e.g., possible consequences of a postulated drop of the heavier cask) not previously reviewed by the NRC. He also stated that NUREG-0612 is provided as guidance, and does not obviate the need for NRR to review the cask drop analysis.

Mr. Yuhas noted that the licensee has taken exception to some of the requirements of the certificate of compliance for the spent fuel cask. He stated that the licensee should specifically address the impact of these exceptions in any 50.59 analysis performed for this transfer evolution. Mr. Yuhas also stated that the licensee should specifically address the potential impact of the use of a heavier spent fuel cask in the Unit 1 spent fuel pool on current pool liner leakage.

Mr. Martin concluded the discussion by reiterating his concern that the fuel transfer issue had unnecessarily become an urgent problem. He expressed concern that the issue had not been previously brought to the attention of senior NRC management. He noted that SCE should get its 50.59 review completed and submitted to the NRC for review, and ensure that similar concerns are addressed at a higher management level in the future.

c. Plugging of Unit 1 Steam Generator Tubes

With regard to the amendment request submitted by SCE for the plugging of Unit 1 steam generator tubes, Mr. Knighton noted that the submittal did not contain adequate information to allow NRR to perform an independent review of the licensee's proposal. He encouraged the licensee to pay more attention to this concern for future license submittals. Mr. Medford stated that SCE had the appropriate technical information for review and would be providing it to NRR in the near future.

d. Performance of Engineering/Technical Work

Mr. Johnson expressed concern that the EQ issue indicated a weakness in the accomplishment of engineering and technical work by SCE. He briefly reviewed other examples of recent NRC observations which reflect upon more recent engineering activities, including (1) the presence of thermal overloads in safety-related valves, contrary to SCE's commitments, and (2) the 1987 single-failure analysis apparently not considering the ability of valves 851A and B to close as required with flow through the valves.

The safety system functional inspection (SSFI) of the safety injection and charging systems, to be conducted by the licensee, was briefly discussed. It was noted that the licensee committed to do this SSFI in Mr. Morgan's letter dated March 17, 1988, to be completed in about eight weeks. In addition, inspection of selected components, to include the HV-851 through -854 valves in one train, would be completed before unit restart. Mr. Martin questioned what some of the technical problems discussed indicate about the effectiveness of present technical work, and encouraged the licensee to assess this carefully. He requested that SCE management be prepared to discuss the preliminary results of this evaluation, as well as possible applicability to Units 2 and 3, at the next management meeting, currently expected in April.

3. Summary

In summary, Mr. Martin noted SCE's intent to correct all known EQ problems before unit restart, except where properly justified otherwise. He expressed concern, however, that proper justification did not appear to have been provided for restarting Unit 1 before the 50.49(b)(2) analysis is completed (by August 31, 1988). He encouraged licensee representatives to assess carefully the controls applied to the accomplishment of engineering and technical work, and requested further discussion of this topic at the next management meeting. He also expressed his dissatisfaction regarding the extremis situation involving the licensee's plans to ship Unit 1 fuel to Units 2 and 3, especially in that senior NRC management had not been involved in the issue.

The meeting adjourned at 4:05 p.m.

NOTE: During discussions between Region V and NRR on March 25, 1988, it was determined that NRR would assume the lead role in evaluating the licensee's corrective actions related to the identified EQ problems, particularly SCE's plan to restart Unit 1 before completion of the 50.49(b)(2) review.



ATTACHMENT 1

AGENDA

Meeting Between NRC and SCE

March 24, 1988

1. Opening remarks, purpose of meeting -- J. B. Martin, Regional Administrator
2. Presentation on and discussion of San Onofre Unit 1 Environmental Qualification (EQ) Problems -- SCE personnel
3. Other items of current interest
4. Closing remarks -- J. B. Martin, Regional Administrator

ATTACHMENT 2

ENVIRONMENTAL QUALIFICATION  
SAN ONOFRE UNIT #1

Background

- A. EQ review initiated under the SEP and amplified by IEB 79-01B.
1. NRC guidelines for review issued February 15, 1980.
  2. SCE submittal of June 18, 1980 met these guidelines. (List was amended by letters dated 10/31/80 and 11/4/81).
  3. NRC guidelines did not require review of non-safety related equipment.
- B. TMI Action plan required EQ list of "TMI" Equipment
1. List provided by letter dated July 2, 1982.
  2. EQ reviews by NRC contractor did not cover TMI equipment.
- C. 10 CFR 50.49 became effective February 22, 1983
1. SCE's response referred to previous submittals, and stated that non-safety related equipment was not included, i.e., (b)(2) items.
  2. Compliance with 10 CFR 50.49 (b)(2) was approved based on work done for SEP, Fire Protection, IE Notices, Circulars, Bulletins and the ECCS Single Failure Evaluation.

ATTACHMENT 2  
(Continued)

Current Review of EQML

- A. Comprehensive review conducted January-February, 1988
1. Approximately 1000 candidate components were screened.
  2. Criteria of 10 CFR 50.49 (b)(1) were utilized, i.e. safety related equipment required to shutdown and/or mitigate accidents.
  3. A few (b)(2) interactions also indicated.
- B. All discrepancies to be remedied during current mid-cycle outage.

ATTACHMENT 2  
(Continued)

Future EQ Work

A. Electrical Interactions

1. Rigorous review is underway of the complete EQML.
2. Criteria of 10 CFR 50.49 (b)(2) are being employed.
3. Discrepancies will be dispositioned at the time of discovery.

B. Post-Accident Monitoring Equipment  
[10 CFR 50.49 (b)(3)]

1. Additional equipment may be added to the list of SONGS 1 post-accident monitoring equipment as a result of ongoing NUREG-0737 Supplement 1 work. Such equipment would then be added to EQML.

ATTACHMENT 2  
(Continued)

CURRENT EQ DISCREPANCIES

	<u>Cause</u>	<u>System</u>	<u>No. of Items</u>
1.	Equipment installed between creation of EQ lists (1981) and establishment of EQ design controls (1984)	AFWS SIS PASS Recirculation	2 2 3 3
2.	Equipment affected by redefined safety-function.	SIS	10
3.	Equipment having supporting function but missed for lack of in-depth evaluation	AFWS CVCS (charging & recirculation)	1 13
4.	Equipment having potential for electrical interaction due to associated circuitry	SIS Recirculation	12 2
5.	Equipment in non-qualified configuration	MFP's	a. LO Cooler b. Air Filter

ATTACHMENT 2  
(Continued)

OPERABILITY CONSIDERATIONS

System

Discussion

SIS

SIS for boration during MSLB is only use affected. Adequate shutdown margin has existed during this fuel cycle without boration. JCO used for single-failure findings is applicable.

AFWS

G10S operability effected by MSLB only. Two out of three components were in essentially qualified configuration. Dedicated shutdown diesel powered AFWP was available for backup. AFWS met all other intended functions.

Charging and  
Recirculation

Six components are environmentally qualified, 10 components are affected by radiation environment only (not likely to fail) and 2 remaining components are (b)(2) items which affect operability of G45A & B.

PASS

System serves no safety function. Ability to draw RCS samples during LOCA is affected.

DFP:1537j