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SUBJECT: Forwards Rev 2 to util 870531 submittal on 10CFR50, App R  
           compliance assessment for plant, per Generic Ltr 86-10.  
           Schedule for completion of fire protection mods provided.  
           Amends to licenses for interim conditions will be submitted.

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January 21, 1988

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362  
San Onofre Nuclear Generating Station  
Units 2 and 3

On May 31, 1987, Southern California Edison Company (SCE) transmitted the Appendix R Compliance Assessment Report for San Onofre Nuclear Generating Station, Units 2 and 3 (SONGS 2 and 3) to the Nuclear Regulatory Commission (NRC). The Compliance Assessment Report documented the criteria, methodology and results of SCE's reassessment of SONGS 2 and 3 compliance with the requirements of 10 CFR 50, Appendix R, Sections III.G, III.J, III.L and III.O in light of new guidance provided in Generic Letter 86-10. Included as enclosures to the May 31, 1987 letter were SCE's responses to the NRC's Request for Additional Information (RAI) dated October 6, 1986 and SCE's formal requests for deviation from the requirements of 10 CFR 50, Appendix R.

By letter dated November 20, 1987, SCE provided clarification of the May 31, 1987 submittal based on NRC questions/comments and other issues pertaining to SONGS 2 and 3 fire protection discussed in meetings between SCE and the NRC in October 1987.

This letter provides further clarification of SCE's May 31, 1987 and November 20, 1987 submittals and addresses other fire protection issues discussed during the NRC site visit to SONGS 2 and 3 conducted the week of December 7, 1987. Enclosure 1 to this letter contains revisions to the October 1986 RAI, the Appendix R Compliance Assessment Report and the formal requests for deviation from the requirements of Appendix R for SONGS 2 and 3. Enclosure 2 contains additional information to support your review of outstanding SONGS 2 and 3 fire protection issues, as discussed in the December 1987 site visit, including testing and maintenance of electrical interrupting devices utilized for safe shutdown (Generic Letter 81-12).

To resolve a number of recent fire protection issues, SCE is implementing additional design modifications which were not described in previous SCE fire protection submittals. These modifications and the expected schedule for completion of each is provided below:

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January 21, 1988

<u>Design Change Package Number</u>	<u>Modification Description</u>	<u>Expected Completion Date</u>
2-6554.33	Unit 2 Train A Diesel Generator Radiator Refill Connection	February 7, 1988
2/3-6554.05	Cable Wrap for Unit 2 Auxiliary Feedwater Pump Discharge Valve 2HV-4730 in Fire Zone 2-161B	Prior to startup following Unit 3, Cycle 4 refueling outage
	Cable Wrap for Unit 3 Auxiliary Feedwater Pump Discharge Valve 3HV-4730 in Fire Zone 3-161B	Prior to startup following Unit 3, Cycle 4 refueling outage
2-6554.32	Install Permanent Ladders and Platforms in Unit 2 to Facilitate Post-Fire Manual Operator Actions	February 7, 1988
2/3-6554.36	Install Early Warning (Ionization) Detection in Turbine Lab (Control Room Complex)	Prior to startup following Unit 3, Cycle 4 refueling outage
3-6554.33	Unit 3 Train A Diesel Generator Radiator Refill Connection	Prior to startup following Unit 3, Cycle 4 refueling outage
3-6554.32	Install Permanent Ladders and Platforms in Unit 3 to Facilitate Post-Fire Manual Operator Actions	Prior to startup following Unit 3, Cycle 4 refueling outage

SCE intends to maintain in-place the compensatory measures described in our letter dated May 8, 1987 until such time as the modifications and associated operator procedures have been implemented. As a given plant design change becomes operational, the need for the corresponding compensatory measure(s) will be eliminated.

In response to a recent NRC inquiry regarding the status of SONGS 2 and 3 Appendix R operating procedures, the Unit 2 post-fire safe (both normal and alternative) shutdown procedures, reflecting the revised safe shutdown analysis and the recently installed Appendix R modifications for Unit 2, are complete and have been fully instituted, except as noted above; for Unit 3, interim post-fire operating procedures will continue to be utilized until the Unit 3 Appendix R modifications have been completed. The Unit 3 modifications and safe shutdown procedures are to be implemented prior to startup following the Unit 3, Cycle 4 refueling outage (i.e. mid-1988).

January 21, 1988

As discussed during the December 1987 NRC site visit, SCE is currently preparing license amendment submittals to request interim fire protection license conditions and fire protection technical specifications for SONGS 2 and 3. Expeditious completion and submittal of the license amendments for NRC review and approval is proceeding; however, to accommodate revisions based on recent discussions with the NRC on these subjects, the proposed amendments will not be submitted to the NRC until February 19, 1988.

In cases where this submittal revises positions reflected in previous fire protection submittals, the enclosed information supersedes that previously submitted.

If you have any questions regarding this matter, please call me.

Very truly yours,



Enclosures

cc: D. Hickman, NRR Project Manager, San Onofre Units 2 and 3  
J. B. Martin, Regional Administrator, NRC Region V  
F. R. Huey, NRC Senior Resident Inspector, San Onofre Units 1, 2 and 3  
D. J. Kubicki, NRC Staff  
C. B. Ramsey, Inspector, NRC Region V

ENCLOSURE 1

REVISION 2 TO SCE'S  
MAY 31, 1987 SUBMITTAL

ENCLOSURE 1

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3. Question

Revision 2

Regarding page 3-8, how have bus ducts, spare conduit sleeves and seismic gaps been sealed so as to conform with the fire rating of the walls and floor/ceiling assemblies in which they are located?

Response

SONGS 2 and 3 does not have bus ducts which penetrate walls which protect safe shutdown equipment.

Spare conduit sleeves are either sealed internally with a silicone foam seal in the plane of the barrier or have the correct size conduit caps properly installed on both ends of the barrier. Both configurations effectively restrict the passage of smoke and hot gasses. The capped conduits are either fitted with plugs that are flush with both sides of the barrier or are capped external to the barrier on both sides. A conduit which is capped external to the barrier is similar to the accepted configuration of a conduit sealed internally on both sides of a barrier. Fire tests of a conduit plugged with caps flush to the barrier have shown that configurations similar to those at SONGS 2&3 can meet the acceptance criteria defined in the Fire Area Boundary Penetration Seal Evaluation Program. The practice of capping spare conduits in lieu of internal seals is an accepted practice in the industry. The evaluation of the designs used to seal spare conduit sleeves will be documented as a part of the SONGS 2 and 3 Fire Area Boundary Penetration Seal Evaluation Program.

Seismic gaps are sealed with a 3 hour rated seal with the following exceptions:

- a. Seismic gaps communicating between a fire area and the soil or the basemat concrete are not sealed with a 3 hour rated seal. This configuration is considered acceptable since the barrier does not function to separate redundant safe shutdown equipment.
- b. Seismic gaps communicating between a fire area and the outside may not be sealed with a 3 hour rated seal. This configuration is considered acceptable since the barrier does not function to separate redundant safe shutdown equipment.

Additionally, there are inaccessible seismic gaps between the walls of adjacent buildings. The raceways passing through the wall on each side of the gap are sealed to a fire rating at least equal to the resistance rating of the wall. The openings into these spaces (e.g., from the outside) are covered to preclude the introduction of transient materials. Although redundant cabling passes through these walls, the barrier established by the penetration seals, the coverings of openings into gaps as well as the low combustible loading in the gap, which is comprised primarily of IEEE 383 cables, essentially eliminates the potential of an exposure fire.

16. Question

Revision 2

Provide a summary of manual actions required for safe shutdown (including repair) and the time limit to accomplish the action before an unrecoverable plant condition occurs.

Response

As part of the reassessment in light of the latest NRC guidance documents on Appendix R, an assessment was made of the operator actions required for a fire in each fire area to reach cold shutdown. The Compliance Assessment Report provided in response to Question 31 describes the criteria for these operator actions. Time constraints from identification of system abnormal operation (due to fire) to perform the required actions for each system were identified and are provided in Attachment 1. The system time constraints for restoring safe shutdown system functions are based on previously analyzed events. A Time and Manpower Study was then performed to assess the manpower requirements to accomplish the actions within the system time constraints. The Time and Manpower Study was performed for actions required to achieve cold shutdown.

The Time and Manpower Study concluded that the limiting operator manning requirements to prevent an unrecoverable plant condition for fires not involving alternate shutdown is for a fire in Fire Area 2-AC-50-29 which is an area common to Units 2 and 3. For a fire in the west side of this area the response to a fire in this area requires the actions of 6 operators outside the control room in addition to 5 operators inside the control room to shutdown both units. Attachment 3 identifies the operator action requirements for a fire in Fire Area 2-AC-50-29, the time the action is required, and the location of the action. Selected operator actions are credited from the control room for both normal and alternate safe shutdown. These are enumerated in Attachment 1 and are discussed in response to Question #32.

For alternative shutdown areas, a minimum of 10 operators plus 3 supervisory operating personnel for a total of 13 are required for operations. These manpower requirements are met by the SONGS 2 and 3 normal shift manning. The minimum staffing requirements are specified in administrative procedure S0123-0-30, "Shift Manning". One of the supervisory operators serves as the fire department technical advisor. This operator is not a part of the fire brigade. He will be available within 8 hours to assist in operator actions. Attachment 2 identifies the operator action requirements for a fire requiring alternative shutdown, the time action is required from system malfunction due to fire, and the location of the action.

A reassessment of the manpower requirements, utilizing delayed times for certain nontime-critical actions, has demonstrated that operator recall is no longer necessary.



16. (continued)

Revision 2

The revised analysis demonstrates the capability to achieve and maintain safe (both normal and alternative) shutdown within the required 72 hour time frame with a minimum of 13 operators. The Time and Manpower Study has been revised to include all operator actions required to achieve cold shutdown.

For a fire in the Train A Shutdown Cooling pump room for both units, potential exists that local temperature and flow indicators would need to be replaced: this repair would only need to be performed prior to initiation of the shutdown cooling system for cold shutdown. A maintenance instruction has been initiated for replacement of these devices. Dedicated flow instrumentation will be available for this repair and replacement temperature indication will be utilized from the alternate unit.

17. Question

Revision 2

Is it necessary for an operator to enter or pass through the fire area for which alternate shutdown is required in order to effect a safe shutdown? If yes, identify the areas and state the time after the discovery of a fire that this activity must take place.

Response

As a result of the Appendix R analysis, it is not required for an operator to pass through or take action in any area for which alternative shutdown is required except for a control room fire. Actions required prior to control room evacuation are discussed in response to RAI. Manual actions are required at local control stations in certain fire areas to support shutdown using normal safe shutdown systems. Actions in the following areas are required potentially within one hour after the discovery of a fire. Failure to complete the action(s) within the one hour time frame, however, would not lead to an unrecoverable condition.

1. For a fire in fire zone 2-AR-37-102A, closure of the volume control tank outlet valves 2LV-0227B (Unit 2) and 3LV-0227B (Unit 3) is required to support the re-establishment of charging pump makeup to the RCS. To reestablish charging within one hour, this action will be taken in the 45-60 minute time frame from indication of system abnormal system operation. An evaluation has been prepared to demonstrate the feasibility of this action.
2. For a fire in fire zone 2-TB-9-148F, opening of the Salt Water Cooling system valve 2HV-6495 is required to support the operation of the Salt Water Cooling System which in turn supports the operation of the charging pump makeup to the RCS. To reestablish charging within one hour, this action will be taken in the 45-60 minute time frame from indication of system abnormal operation. An evaluation has been prepared to demonstrate the feasibility of this action.
3. For a fire in fire zone 3-TB-9-148F, opening of the Salt Water Cooling system valve 3HV-6495 is required to support the operation of the Salt Water Cooling System which in turn supports the operation of the charging pump makeup to the RCS. To reestablish charging within one hour, this action will be taken in the 45-60 minute time frame from indication of system abnormal operation. An evaluation has been prepared to demonstrate the feasibility of this action.
4. For a fire in fire zone 2-SE-8-140A, opening of the Component Cooling Water surge tank isolation valve 2HV-6505 is required to support operation of the Component Cooling Water System which in turn supports the operation of the charging pump makeup to the RCS.

17. (continued)

Revision 2

To reestablish charging within one hour, this action will be taken in the 45-60 minute time frame from indication of system abnormal operation. An evaluation has been prepared to demonstrate the feasibility of this action.

5. For a fire in fire zone 3-SE-8-140A, opening of the Component Cooling Water surge tank isolation valve 3HV-6505 is required to support operation of the Component Cooling Water system which in turn supports operation of the charging pump makeup to the RCS. To reestablish charging within one hour, this action will be taken in the 45-60 minute time frame from indication of system abnormal operation. An evaluation has been prepared to demonstrate the feasibility of this action.

There are other fire areas for which actions are required inside the area of the postulated fire to achieve a post fire shutdown using normal shutdown systems. The time constraints for these actions are sufficiently extended (actions required after 1 hour) such that these are not considered critical actions.

10CFR50 Appendix R  
Compliance Assessment Report  
For  
San Onofre  
Generating Station  
Units 2 and 3

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Revision 2  
January 1988

the possible time delay for completing the action resulting from the fire fighting activities which must occur prior to entry into the fire area. For cases where an action in the area of the fire is required prior to 1 hour, an evaluation has been conducted to ensure that the action can be completed subsequent to extinguishing the fire without exceeding the time constraints for the action. Actions in the fire area in less than one hour where an Appendix R fire scenario occurs include:

- Manual closure of the VCT Outlet Valves 2LV-0227B and 3LV-0227B in fire zone 2-AR-37-102A to isolate the VCT.
  - Manual control of the SWC Heat Exchanger 002B Discharge Valves 2HV-6495 and 3HV-6495, in fire zones 2-TB-9-148F and 3-TB-9-148F, respectively, in order to provide saltwater cooling to the CCW system.
  - Manual control of the CCW Surge Tank isolation valves 2HV-6505 and 3HV-6505, in fire zones 2-SE-8-140A and 3-SE-8-140A respectively, in order to restore Component Cooling Water.
7. The time lines account for all actions taking place outside of the control room (fire area 2-AC-30-20) and actions internal to the control room which are preconditions for completing the actions in the field.

10. Miscellaneous modifications (i.e. removing tray covers, adding metal hatches, platforms).
11. Penetration Seal Modification  
This modification is to provide penetration seals in the fire area boundaries.
12. Valve/Damper Operator Modification  
Modification to the operator for valves/dampers to alter their safe shutdown failure position.
13. Modification to Sprinkler System  
Modification to enhance the fire protection sprinklers system.
14. Modification to Diesel Generators  
Modification to provide a connection to refill the radiator in the event of a diesel generator trip on high temperature.

#### 4.10.2 High/Low Pressure Interface Valves

The valves identified as Category HLP in the component list (Appendix B) were evaluated for spurious operation which could result in failure of the high/low pressure interface with the Reactor Coolant System.

These valves were analyzed as follows:

1. SDC Letdown Isolation Valves HV-9337 and HV-9377 provide a high/low pressure interface between the RCS and the Shutdown Cooling System. Valves HV-9337 (Train A) and HV-9339 (Train B)

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APPENDIX R III.G/III.L COMPLIANCE ASSESSMENT  
SUMMARY TABLE

FIRE AREA	METHOD (S) OF COMPLIANCE	DEVIATION	EVALUATION	MODIFICATIONS	CIRCUIT		MANUAL
					ANALYSIS	SEPARATION	ACTIONS REPAIRS
2-SE-(-15)-136	III.G.1, III.G.2.c	N	12a, 12c	11b, 11c	3, 9	2, 5	10b
2-SE-(-15)-137	III.G.1, III.G.2.a	N	12a	11b, 11g, 11f	3, 9	2	10a, 10b 8
2-SE-(-15)-138	III.G.1	N	12a	11f	3	2	10b -
2-SE-(-15)-139	III.G.1	N	12a	11f	3	2	10a, 10b -
2-SE-8-140	III.G.1	N	12a	11g	3, 9	2	10a, 10b -
2-SE-8-141	III.G.1	N	12a	-	3, 9	2	10b -
2-CT-(-2)-142	III.G.1, III.G.2.b, III.G.2.c	Y	12a, 12b, 12c	11b, 11c	3, 9	2, 5	10b -
2-SE-30-143	III.G.1	N	-	-	-	1	- -
2-SE-30-144	III.G.1	N	12a	-	-	1	- -
2-SE-25-145	III.G.1	N	12a	-	3	2	10a, 10b -
2-SE-50-146	III.G.1	N	12a	-	-	1	- -
2/3-TB-(-9)-148	III.G.1., III.G.2.b, III.G.2.c	Y	12a, 12b, 12c	11e, 11g	3, 9	2, 5	10a, 10b -
2-TB-7-149	III.G.1	N	12a	-	-	1	- -
2-TB-7-150	III.G.1	N	-	-	-	1	- -
2-TB-30-153	III.G.1	N	12a	-	3	2	- -
2/3-TB-72-154	III.G.1.	N	12a	-	-	1	- -

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APPENDIX R III.G/III.L COMPLIANCE ASSESSMENT  
SUMMARY TABLE

FIRE AREA	METHOD (S) OF COMPLIANCE	DEVIATION	EVALUATION	MODIFICATIONS	CIRCUIT ANALYSIS	SEPARATION	MANUAL ACTIONS	REPAIRS
2-DG-30-155	III.G.1	N	-		3	2	10b	-
2-DG-30-156	III.G.1	N	-	-	-	1	-	-
2-DG-30-157	III.G.1	N	12a	-	-	2	-	-
2-DG-30-158	III.G.1	N	-	-	3	2	10b	-
2-DG-20-159	III.G.1	N	-	-	3	2	10b	-
2-DG-20-160	III.G.1	N	-	-	3	2	10b	-
2-TK-(-2)-161	III.G.1, III.G.2.b, III.G.2.c	Y	12a,12b, 12c	11b, 11c	3,9	2,5	10a, 10b	-
2-TK-30-162	III.G.1	N	12a	-	-	1	-	-
2-TK-30-163	III.G.1	N	12a	11b	3	-	10a,10b	-
2-TK-30-164	III.G.1	N	12a	11b	3	-	10a,10b	-
2-TK-30-165	III.G.1	N	12a	-	-	1	-	-
2-TK-30-166	III.G.1	N	12a	-	3	2	10b	-
2-CO-15-167	III.G.1	N	-	-	-	1	-	-
2-CO-15-168	III.G.1	N	-	-	-	1	-	-
2-AC-(-5)-169	III.G.1	N	12a	-	3	-	-	-
2-SE-(-12)-170	III.G.1	N	12a	-	-	2	10b	-
2-SE-30-171	III.G.1	N	-	-	-	1	-	-
2-SE-70-172	III.G.1	N	-	-	-	1	-	-
2-FH-30-174	III.G.1	N	12a	-	-	1	-	-
2-AC-70-175	III.G.1	N	12a	-	-	1	-	-

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APPENDIX R III.G/III.L COMPLIANCE ASSESSMENT  
SUMMARY TABLE

FIRE AREA	METHOD(S) OF COMPLIANCE	DEVIATION	EVALUATION	MODIFICATIONS	CIRCUIT ANALYSIS	SEPARATION	ACTIONS	REPAIRS
3-SE-(-15)-137	III.G.1, III.G.2.a	N	12a	11g, 11b, 11f	3, 9	2	10a, 10b	8
3-SE-(-15)-138	III.G.1	N	12a	11f	3	2	-	-
3-SE-(-15)-139	III.G.1	N	12a	11f	3	2	10a, 10b	-
3-SE-8-140	III.G.1	N	12a	11g	3, 9	2	10a, 10b	-
3-SE-8-141	III.G.1	N	12a	-	3, 9	2	10b	-
3-CT-(-2)-142	III.G.1, III.G.2.b, III.G.2.c	Y	12b, 12c	11b, 11c	3, 9	2, 5	10b	-
3-SE-25-145	III.G.1	N	12a	-	3	2	10a, 10b	-
3-SE-50-146	III.G.1	N	12a	-	-	1	-	-
3-TB-7-149	III.G.1	N	12a	-	-	1	-	-
3-TB-7-150	III.G.1	N	-	-	-	1	-	-
3-TB-30-153	III.G.1	N	12a	-	3	2	-	-
3-DG-30-155	III.G.1	N	-	-	3	2	10b	-
3-DG-30-156	III.G.1	N	-	-	-	1	-	-
3-DG-30-157	III.G.1	N	-	-	-	1	-	-
3-DG-30-158	III.G.1	N	-	-	3	2	10b	-
3-DG-20-159	III.G.1	N	-	-	3	2	10b	-
3-DG-20-160	III.G.1	N	-	-	3	2	10b	-

APPENDIX R III.G/III.L COMPLIANCE ASSESSMENT  
SUMMARY TABLE

FIRE AREA	METHOD (S) OF COMPLIANCE	DEVIATION	EVALUATION	MODIFICATIONS	CIRCUIT			SEPARATION	MANUAL	
					11b,11c	3,9	2,5		ACTIONS	REPAIRS
3-TK-(-2)-161	III.G.1, III.G.2.b, III.G.2.c	Y	12a,12b, 12c			3,9	2,5	10a, 10b	-	-
3-TK-30-163	III.G.1	N	12a	11b	3		-	10a,10b	-	-
3-TK-30-164	III.G.1	N	-	11b	3		-	10a,10b	-	-
3-TK-30-165	III.G.1	N	12a	-	-		1	-	-	-
3-TK-30-166	III.G.1	N	-	-	3		2	10b	-	-
3-CO-15-167	III.G.1	N	-	-	-		1	-	-	-
3-CO-15-168	III.G.1	N	-	-	-		1	-	-	-
3-SE-(-12)-170	III.G.1	N	12a	-	-		2	10b	-	-
3-SE-30-173	III.G.1	N	12a	-	-		1	-	-	-
3-FH-30-174	III.G.1	N	12a	-	-		1	-	-	-
3-SE-(-2)-176	III.G.1	N	12a	-	3		-	-	-	-

APPENDIX R III.G/III.L COMPLIANCE ASSESSMENT  
SUMMARY TABLE

NOTES

The following notes apply to the summary table:

1. No redundant Safe Shutdown equipment/cables in fire area.
2. Redundant circuits/equipment resolved by redundant components outside F.A.
3. Redundant circuits resolved by circuit analysis.
4. Redundant circuit protected by 3 hour wrap.
5. Redundant circuit protected by existing 1 hour wrap and suppression and detection.
6. Redundant circuit/equipment protected by 20 ft. separation and suppression/detection.
7. Redundant circuit/equipment resolved by alternate shutdown.
8. Redundant circuit/equipment resolved by repairs.
9. Redundant circuit/equipment resolved by CPS analysis.
- 10
  - a. Redundant circuit/equipment resolved by manual actions inside fire area.
  - b. Redundant circuit/equipment resolved by manual actions outside fire area.
11. Redundant circuit/equipment resolved by modifications for each F.A.
  - a. Fuse Modifications
  - b. Local Instrument Indicator Modifications
  - c. Cable Wrap Modifications
  - d. Circuit and Switches Modifications
  - e. Saltwater Cooling (SWC) Modifications
  - f. Miscellaneous modifications (i.e. removing tray covers, adding metal hatches, platforms).
  - g. Penetration Seals
  - h. Valve/Damper Operator Modification
  - i. Modification to Sprinkler System
12. Evaluation Required
  - a. Fire Area Boundary
  - b. Separation
  - c. Suppression/Detection

DEVIATION NO. 9**UNITS 2 AND 3 CONTROL ROOM COMPLEX  
FIRE AREA 2/3-20**Deviation Requested

A deviation is requested from Southern California Edison's commitment to Section III.G.3 of Appendix R to 10 CFR 50 to the extent it requires the existence of a fixed fire suppression system. Specifically, this deviation is requested for the installation of a fixed fire suppression system in the Control Room.

Discussion

Fire Area 20 is located in the center of the Auxiliary Control Building at elevation 30 feet and is comprised of the following five fire zones: 2-AC-30-20A (Control Room and Cabinet Area), 3-AC-30-20B (Computer Room 3), 2-AC-30-20C (Computer Room 2), 2-AC-39-20D (Technical Support Center), and 2-AC-30-20E (Lobby). This fire area can be generally defined as the Units 2 and 3 Control Room complex. This area contains redundant safe shutdown equipment however, alternate shutdown capability that is physically and electrically independent of the area is provided. A general discussion of the relevant fire considerations for each of the fire zones in this area is provided below.

**2-AC-30-20A**

Fire zone 2-AC-30-20A is bounded by a 3-hour rated reinforced concrete wall on the east and a 3-hour rated reinforced concrete wall on the exterior portion of the west wall. This zone is separated from the Lobby (2-AC-30-20E) by plaster partitions and bullet-resistant wire glass. Three 3-hour rated doors open into this fire zone from the Lobby. A 2-hour rated concrete wall separates this zone from the stairwell (2-AC-30-24). The remainder of the zone walls are 2-hour rated concrete, or metal framed plaster construction. The floor and ceiling are 2-hour rated. Support columns are protected by 2 hour rated vermiculite fireproofing. Bulletproof glass and 2-hour rated walls separate this fire zone from the Technical Support Center (Fire Zone 2-AC-39-20D) which is located on the mezzanine level of the control room. Fire Zone 2-AC-30-20A also communicates with the cable riser galleries (2-AC-30-28 and 3-AC-30-21) through 3-hour rated doors, the pipe chase (2-AC-9-16) through a 1 1/2-hour rated door, and the Computer Rooms (2-AC-30-20C and 3-AC-30-20B) currently through 3-hour rated doors. It is desirable that the existing Computer Room doors be replaced with 1 1/2-hour rated doors with wired glass windows. (See 3-AC-30-20B and 2-AC-30-20C discussion, below.)

Approximately 50% of the combustibles in this area are cable insulation and the total in-situ fire loading is approximately 16,400 BTU/sq.ft.. The postulated in-situ fire duration is 12 minutes. Transient combustibles are controlled by plant Administrative procedures. Automatic fire suppression equipment is not installed in this fire zone. However, localized heat detection is provided in support areas such as the watch engineer's office, instrument repair room, turbine lab and the kitchen. Localized ionization smoke detectors are provided in the back panel area, women's locker room, and certain class IE control room cabinets. These detectors provide early warning to the site fire department office as well as the control room for fire department response. The San Onofre fire department has a minimum of five certified fire fighters on duty per shift. Fire extinguishers are provided and a hose station is available from an adjacent area.

In response to an NRC request to provide additional fire protection features for the Turbine Lab portion of fire zone 2-AC-30-20A, ionization detection will be installed in the Turbine Lab, to supplement the existing heat detection, in lieu of upgrading the fire resistance rating of the Turbine Lab walls or providing a fixed water suppression system.

### **3-AC-30-20B and 2-AC-30-20C**

Fire zones 3-AC-30-20B and 2-AC-30-20C (Computer Rooms) are each 1104 sq. ft. of floor area and are south and north, respectively, of the Control Room (2-AC-30-20A) and communicate with the Control Room as noted above (3-hour rated doors). The Computer Rooms have the equivalent of 1-hour rated walls and 2-hour rated floors and ceilings. Because these rooms are located in high traffic areas, when people currently exit through the 3-hour rated doors, personnel in the surrounding vicinity could be struck by the doors. Therefore, SCE would like to replace the existing doors with 1 1/2-hour rated doors, each with a wired glass window whose area will not exceed 100 square inches. Since the barrier rating of the subject walls is 1-hour rated, no impact to the minimum barrier rating and the overall fire protection features provided is introduced by this proposed door change. SCE requests approval of this proposed modification as part of this deviation request.

The combustible loading in these zones consists of cable insulation and Class A combustibles. The total in-situ fire loading is approximately 7,000 BTU/sq.ft. and 12,200 BTU/sq.ft. in zones 20B and 20C, respectively. The postulated in-situ fire duration is 6 minutes and 9 minutes in zones 20B and 20C, respectively. Transient combustibles are controlled by plant Administrative Procedures. An automatic total flooding Halon 1301 fire suppression system is provided in each of these fire zones. The systems have a main and reserve supply of Halon 1301. Ionization smoke detectors and heat detectors are also provided in both zones. The heat detectors are provided for halon system

actuation. The detectors provide early warning alarm to the site fire department office as well as the Control Room for fire department response. The San Onofre fire department has a minimum of five certified fire fighters on duty per shift. Fire extinguishers are provided in fire zone 20C and in an adjacent zone to 20B. A hose station is available from an adjacent area.

#### **2-AC-39-20D**

Fire zone 2-AC-39-20D (Technical Support Center) is 1246 sq.ft. of floor area and is on the mezzanine level of the Control Room. As noted above, this fire zone communicates with fire zone 2-AC-30-20A through bulletproof glass and 2-hour rated walls. The east wall is non-rated and the remaining walls are 1-hour rated. The floor and ceiling are both 2-hour rated.

This fire zone has miscellaneous and Class A combustibles with a total in-situ fire loading of approximately 28,900 BTU/sq.ft.. The postulated in-situ fire duration is 22 minutes. Ionization smoke detectors and heat detectors are provided in this zone. These fire detectors provide early warning alarm to the site fire department office as well as the Control Room for fire department response. Manual fire suppression equipment in the form of fire extinguishers and a hose station are provided in this zone.

#### **2-AC-30-20E**

Fire zone 2-AC-30-20E (Lobby) is 1541 sq.ft. of floor area and is west of the Control Room and between the two Computer Rooms. The west wall is reinforced concrete with a 3-hour rating. The walls surrounding the elevator (2-AC-9-18) are 2-hour rated reinforced concrete. A non-rated door opens to the elevator. The walls separating this area from the pipe chase (2-AC-9-16) are 2-hour rated metal framed plaster construction. The wall adjoining the Control Room is a plaster partition with bullet-resistant wire glass. Three 3-hour doors communicate with the Control Room to the technical support center at the mezzanine level (2-AC-39-20D). The remainder of the area walls are 1-hour rated metal framed plaster. The floor and ceiling are 2-hour rated. Two 3-hour fire rated doors installed in the concrete opening form the separation from the Turbine Building (2-TB-34-148D). A 1 1/2-hour door communicates with the stairway (2-AC-30-24).

This fire zone has 200 lbs. of Class A materials with an in-situ fire loading of approximately 1,000 BTU/sq.ft. The postulated in-situ fire duration is less than one minute. Transient combustibles are controlled by plant Administrative Procedures. Heat detection is provided for this zone that provides early warning alarm to the site fire department office as well as the Control Room for fire department response. A minimum of five certified fire fighters are on duty per shift. Manual fire suppression equipment in the form of portable fire extinguishers and a hose station are readily available.

### Evaluation

A deviation from the requirements of Section III.G.3 to provide an automatic fire suppression system for plant areas with alternative shutdown capability is requested based upon the following evaluation:

The objective for the protection of safe shutdown capability is to ensure that at least one means of achieving and maintaining safe shutdown conditions will remain available during and after any postulated fire in any area in the plant. In the event of a fire in the Control Room, alternative shutdown capability is provided in areas physically and electrically independent of the Control Room area. Fire detection equipment is provided in the Control Room complex to provide early warning alarm to the site fire department. In addition, the Control Room is constantly manned by operations personnel such that fire conditions can be identified by visual observation and corrective actions can be immediately initiated. Manual fire suppression equipment is provided in this fire area and is adequate for the types of combustibles and magnitude of fire postulated.

### Conclusion

Ionization detection, for early warning capability, will be installed in the Turbine Lab located in fire zone 2-AC-30-20A.

It is, therefore, Southern California Edison's position that a level of protection equivalent to Section III.G.3 of Appendix R to 10 CFR 50 will be provided in the Control Room. The addition of a fixed fire suppression system would not significantly enhance the level of fire protection for safe shutdown or alternative shutdown equipment.

sight between the valves. Power and instrument cables for these valves are routed in conduits which run underneath the floor grating along the northwest wall. Their point of least horizontal separation is approximately 5'-0" where the conduits penetrate the northwest wall. The conduits containing power and control cables for Train A valve 2HV-4730 will be wrapped in a one hour barrier from where the cables enter the fire zone to the valve operator.

#### Evaluation

A deviation from the requirements of Section III.G.2 to provide 20 feet of separation free of intervening combustibles between the auxiliary feedwater pumps and valves in zone 2-TK-30-161A and to provide automatic suppression, detection, and 20 feet of separation free of intervening combustibles in zone 2-TK-(-2)-161B and to provide rated fire doors into areas 2-SE-(-15)-138 and 2-SE-(-15)-136 is requested based on the following evaluation:

The AFW pump room (fire zone 2-TK-30-161A) has zone wide automatic detection and suppression systems. In addition to a zone wide automatic sprinkler system which actuates on a signal from the installed flame detectors, a second automatic water spray system is located over the Train B and C auxiliary feedwater pumps that is actuated by rate compensated heat detectors. Zone wide ionization detectors provide early warning in the site fire department office as well as in the Control Room to alert the site fire department and manual suppression equipment exists in the fire zone and adjacent yard. These fire protection features, in addition to the missile barrier which acts as a radiant energy shield and greater than 20 foot separation between the Train A and B auxiliary feedwater pumps, provides reasonable assurance that any fire in the zone would remain localized and not damage both redundant trains. The primary intervening combustible between the pumps could consist of gravity fed lube oil to the pump bearings only in the event of a piping failure. If the sight glass on the collection tank were to rupture, the oil would drain onto the floor and would not pose a spray hazard. In addition the partial height wall would prevent the oil from spreading to the redundant pump.

Of the four auxiliary feedwater discharge valves in zone 2-TK-(-2)-161B, only one is required to open to allow auxiliary feedwater flow into containment. These valves are located on opposite sides of a partial wall which serves as a radiant energy shield between the valves. There are no in-situ combustibles in the cable tunnel. Oil in the two hydraulic operated valves in the tunnel is of negligible quantity and located well below the redundant motor operated valves. The station transient combustible procedure will be revised to prevent the accumulation of transient combustibles in this zone, thus further minimizing the presence of combustibles. There is no safe shutdown cables or equipment within 50 feet of the non-rated watertight doors. The watertight doors are similar to those approved previously by the NRC. Manual fire suppression equipment exists in adjacent zones and the outside yard which can be used to suppress a fire. Because of the



limited amount of combustibles, the physical configuration of the auxiliary feedwater discharge valves and the addition of one hour wrap on the power and control cables for Train A valve 2HV-4730 in this fire zone, a fire of sufficient magnitude to disable all four valves is not considered possible.

Deviation from the use of automatic suppression and detection systems in fire zone 2-TK-(-2)-161B with no combustibles present (i.e., all cable routed in conduit) as well as for the configuration of the AFW pump room fire zone 2-TK-30-161A was granted in Section 9.5.1 of the NRC's Safety Evaluation Report and Supplements 4 and 5 thereto, and in the Safety Evaluation related to the issuance of Operating License NPF-15, San Onofre Unit 3. This deviation request provides clarification of the installed geometry of safe shutdown equipment and cables in the zone.

#### Conclusion

It is therefore Southern California Edison's position that the addition of a one hour wrap in zone 161B will provide a level of protection equivalent to Section III.G.2 of Appendix R to 10 CFR 50 for fire area 2-161. Additional protection or the removal of intervening combustibles in zone 161A and the addition of detection and suppression systems in zone 161B would not significantly enhance the level of fire protection provided for safe shutdown equipment.

DEVIATION NO. 11**UNIT 3 AUXILIARY FEEDWATER PUMP ROOM AND PIPE TUNNEL  
FIRE AREA 3-161**Deviation Request

A deviation is requested from Southern California Edison's commitment to Section III.G.2 of Appendix R to 10 CFR 50 to the extent it requires separation of redundant safe shutdown equipment and cables by 20 feet free of intervening combustibles, and protection by automatic suppression and detection systems. Specifically, (1) redundant safe shutdown auxiliary feedwater pumps and related valves in fire zone 3-TK-30-161A are separated by over 20 feet with intervening combustibles and (2) redundant auxiliary feedwater isolation valves in fire zone 3-TK-(-2)-161B are separated by less than 20 feet with no automatic suppression or detection. Additionally, the fire area boundary separating zone 3-TK-(-2)-161B from areas 3-SE-(-15)-138 and 3-SE-(-15)-136 is not a 3-hour rated barrier.

Discussion

The Auxiliary Feedwater Pump Room and Pipe Tunnel Fire Area 3-161 consists of fire zones 3-TK-30-161A and 3-TK-(-2)-161B which are open to each other. The auxiliary feedwater pump room (fire zone 3-TK-30-161A) is located in a separate building south of Unit 3 containment. It is adjacent to the condensate and refueling water storage tanks. The auxiliary feedwater piping tunnel (fire zone 3-TK-(-2)-161B) connects zone 3-TK-30-161A to Unit 3 containment. The tunnel extends west, from underneath the auxiliary feedwater pump room, turns north to cross under the electrical cable tunnel, and then turns east to pass under the Safety Equipment Building into Unit 3 containment.

The total in-situ combustible loading in fire zone 3-TK-30-161A is approximately 20,500 BTU/sq. ft. which consists of pump oil and cable insulation and equates to an equivalent fire severity of 16 minutes. In addition, there are two 60 gallon oil tanks on the roof of the fire zone. The oil in these tanks is used to cool the motor bearings for the two motor driven auxiliary feedwater pumps. If the contents of both of these oil tanks is released, the fire loading will increase by 9,240 BTU/sq. ft. Fire zone 3-TK-(-2)-161B has no in-situ combustibles. Cables in the zone are routed in conduits and the negligible quantity of oil in the two hydro-pneumatic valves is not considered to contribute to the fire load. Transient combustibles are controlled by plant administrative procedures.

The AFW pump room is bounded by a 3-hour rated reinforced concrete south wall, the other walls are reinforced concrete approximately 2 feet thick, and the floor and ceiling are reinforced concrete approximately 2 feet thick. A partial height missile shield, approximately 5-1/2 feet high, constructed of reinforced concrete separates the Train A (motor driven) redundant auxiliary feedwater pump

underneath the floor grating along the southwest wall. Their point of least horizontal separation is approximately 5 feet where the conduits penetrate the southwest wall. The conduits containing power and control cables for Train A valve 3HV-4730 will be wrapped in a one hour barrier from the point where the cables enter the fire zone to the valve operator.

#### Evaluation

A deviation from the requirements of Section III.G.2 to provide 20 feet of separation free of intervening combustibles between the auxiliary feedwater pumps and valves in zone 3-TK-30-161A and to provide automatic suppression, detection, and 20 feet of separation free of intervening combustibles in zone 3-TK-(-2)-161B and to provide rated fire doors into areas 3-SE-(-15)-138 and 3-SE-(-15)-136 is requested based on the following evaluation:

The AFW pump room fire zone 3-TK-30-161A has zone wide automatic detection and suppression systems. In addition to a zone wide automatic sprinkler system which actuates on a signal from the installed flame detectors, a second automatic water spray system is located over the Train B and C auxiliary feedwater pumps that is actuated by rate compensated heat detectors. Zone wide ionization detectors provide early warning in the site fire department office as well as the Control Room to alert the fire department. Manual suppression equipment exists in the fire zone and adjacent yard. These fire protection features, in addition to the missile barrier which acts as a radiant energy shield and greater than 20 foot separation between the Train A and B auxiliary feedwater pumps, provides reasonable assurance that any fire in the zone would remain localized and not damage both redundant trains. The primary intervening combustible between the pumps could consist of gravity fed lube oil to the pump bearings only in the event of a piping failure. In the sight glass on the collection tank were to rupture, the oil would drain onto the floor and would not pose a spray hazard. In addition, the partial height wall would prevent the oil from spreading to the redundant pump.

Of the four auxiliary feedwater discharge valves in zone 3-TK-(-2)-161B, only one is required to open to allow auxiliary feedwater flow into containment. These valves are located on opposite sides of a partial wall which serves as a radiant energy shield between the valves. There are no in-situ combustibles in the cable tunnel. Oil in the two hydraulic operated valves in the tunnel is of negligible quantity and located well below the redundant motor operated valves. The station transient combustible procedure will be revised to prevent the accumulation of transient combustibles in this zone, thus further minimizing the presence of combustibles. There are no safe shutdown cables or equipment within 50 feet of the non rated watertight doors. The watertight doors are similar to those approved previously by the NRC. Manual fire suppression equipment exists in adjacent zones and the outside yard which can be used to suppress a fire. Because of the limited amount of combustibles, the physical configuration of the auxiliary feedwater discharge valves and the addition of one hour wrap

on the power and control cables for Train A valve 3HV-4730 in the fire zone, a fire of sufficient magnitude to disable all four valves is not considered possible.

Deviation from the use of automatic suppression and detection systems in fire zone 3-TK-(-2)-161B with no combustibles present (i.e., all cable routed in conduit) as well as for the configuration of the AFW pump room, fire zone 3-TK-30-161A was granted in Section 9.5.1 of the NRC's Safety Evaluation Report and Supplements 4 and 5 thereto, and in the Safety Evaluation related to the issuance of Operating License NPF-15, San Onofre Unit 3. This deviation request provides clarification of the installed geometry of safe shutdown equipment and cables in the zone.

#### Conclusion

It is, therefore, Southern California Edison's position that the addition of a one hour wrap in zone 161B will provide a level of protection equivalent to Section III.G.2 of Appendix R to 10 CFR 50 for fire zone 3-161. Additional protection or the removal of intervening combustibles in zone 161A and the addition of detection and suppression systems in zone 161B would not significantly enhance the level of fire protection provided for safe shutdown equipment.

ENCLOSURE 2

ADDITIONAL INFORMATION

ON SONGS 2 AND 3

APPENDIX R/ FIRE PROTECTION ISSUES

ENCLOSURE 2

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SCE RESPONSE TO  
GENERIC LETTER 81-12 GUIDELINES ON  
ELECTRICAL PROTECTIVE DEVICES

During the October 20-21, 1987 meetings, the NRC requested clarification on the methodology used to maintain coordination of electrical protective devices associated with safe shutdown circuits at San Onofre Units 2 and 3, particularly with respect to the guidelines specified in Generic Letter 81-12.

This information was presented to the NRC in meetings conducted during the week of December 7, 1987. This response to the NRC request documents SCE's presentation on this issue.

The relevant Generic Letter 81-12 guidelines are listed below along with a description of the San Onofre program as it relates to each guideline. The program provides adequate assurance that the electrical interrupting devices at San Onofre Units 2 and 3 will perform their intended function and, thereby, ensure the ability to achieve and maintain safe shutdown in the event of a fire.

As described in Generic Letter 81-12, the acceptability of a particular interrupting device is considered demonstrated if the following criteria are met:

81-12 Guideline

"(i) The interrupting device design shall be factory tested to verify overcurrent protection as designed in accordance with the applicable UL, ANSI, or NEMA standards."

Response:

The designs of applicable interrupting devices have been factory tested to verify overcurrent protection as designed in accordance with the applicable UL, ANSI, or NEMA standards.

81-12 Guideline

"(ii) For low and medium voltage switchgear (480 V and above) circuit breaker/protective relay periodic testing shall demonstrate that the overall coordination scheme remains within the limits specified in the design criteria. This testing may be performed as a series of overlapping tests."

"(iii) Molded case circuit breakers shall periodically be manually exercised and inspected to insure ease of operation. On a rotating refueling outage basis a sample of these breakers shall be tested to determine that breaker drift is within that allowed by the design criteria. Breakers should be tested in accordance with an accepted Q.C. testing methodology such as MIL STD 105D."

Response:

Class IE 4.16kv and 480v switchgear protective devices are tested on a rotating basis during refueling.

Molded case circuit breakers specified in Technical Specification 3.8.4 are tested on a rotating basis during refueling.

In accordance with NEMA Standards AB2-1984 Section 1 and AB3-1984 Section 7 and vendor recommendations, molded case circuit breakers not governed by Technical Specification 3.8.4 are tested upon installation and when they show signs of degraded performance.

Although most Class IE breakers are normally exercised during routine maintenance activities, exercise and inspection of all Class IE molded case breakers is not proceduralized in the preventive maintenance program. The existing preventive maintenance program is being modified to require NEMA AB2-1984 Section 2 recommended inspections and preventive maintenance on all Class IE molded case breakers on a rotating refueling outage basis, starting with the upcoming Unit 3 Cycle IV refueling.

81-12 Guideline

"(iv) Fuses when used as interrupting devices do not require periodic testing, due to their stability, lack of drift, and high reliability. Administrative controls must insure that replacement fuses with ratings other than those selected for proper coordinating are not accidentally used."

Response:

The correct fuse is specified on the switchgear or motor control center bill of material and/or elementary diagram. The Station Work Authorization procedure controls the fuse removal and replacement process at San Onofre, Units 2 and 3. In some applications in the plant, fuses are the only disconnecting/interrupting device provided. In order to perform maintenance activities, these fuses must be removed and then later reinstalled in order to deenergize equipment for personnel safety.

To enhance the fuse replacement process and to aid in the rapid verification of the installed fuse, labels in the vicinity of each fuse holder will be installed in both Units 2 and 3 prior to the completion of the Unit 3 cycle IV refueling.



AUXILIARY FEEDWATER TURBINE DRIVEN PUMP  
LUBE OIL SHROUD SURVEILLANCE

STATEMENT OF COMMITMENT

- o San Onofre Unit 3 License Condition 2.C(12)b.2 required installation of a metal shroud on the Auxiliary Feedwater (AFW) turbine driven pump lube oil system prior to exceeding five (5) percent power. Additionally, a similar shroud was backfitted on the Unit 2 turbine driven AFW pump.
- o San Onofre Units 2 and 3 operating procedure, S023-3-3.25, Once-a-Shift Surveillance (Modes 1-4), Revision 7, requires a shiftly check of both the Unit 2 and Unit 3 AFW turbine driven pump lube oil shroud.

SCE POSITION

The AFW turbine driven pump lube oil shroud functions to protect the adjacent auxiliary feedwater pumps and motors from oil spray which could create a fire hazard in the event of a lube oil line rupture. While this oil shroud constitutes a part of the fire protection program, its surveillance interval should be consistent with, and no more restrictive than, that of other plant fire protection features of its type--namely, eighteen (18) months.

BASIS FOR ACCEPTABILITY

The Technical Specification surveillance interval for fire barriers (i.e. walls, floors and ceilings) and one hour fire-rated assemblies (exposure fire barriers for raceway enclosures) is currently every 18 months. Following an NRC walkdown and a subsequent 18-month shroud surveillance in which the shroud was not in place, the required once-a-shift shroud check was initiated in December 1984.

A comprehensive review of the shiftly shroud surveillances for both Units 2 and 3 was recently conducted. The review considered shiftly inspections from implementation in December 1984 until the end of April 1987 for Unit 2 and until May 1987 for Unit 3 (a total of 4283 checks). The review identified only two instances where the shroud was improperly installed. In one case, the plant was in mode 4 and the shroud was not necessary to satisfy the license condition, since the AFW system was not necessary to support plant operation at that time. In the other case, a small piece of shroud was missing and the missing piece did not adversely impact the shroud's ability to prevent oil from spraying on the adjacent pumps and motors in the event of an oil line rupture.

Based on the results of this investigation, administrative procedures have demonstrated the consistent operability of the AFW turbine driven pump oil shroud installation. Therefore, inspecting the oil shroud on an 18 month surveillance interval, consistent with other fire protection features of this type, is appropriate and will not adversely impact the fire protection program or the ability to achieve and maintain safe shutdown.