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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

October 18, 1978

Docket No. 50-206

LICENSEE: Southern California Edison Company (SCEC)  
FACILITY: San Onofre, Unit 1 (SO-1)  
SUBJECT: SUMMARY OF SEPTEMBER 15, 1978 MEETING CONCERNING FIRE  
PROTECTION PROGRAM FOR SO-1

On September 15, 1978, the NRC staff met with representatives of SCEC to discuss SCEC's plans and schedules for facility modifications for fire protection at SO-1. A list of attendees is enclosed.

During a previous meeting on August 29, 1978, SCEC outlined its preliminary schedule for implementation of planned modifications for fire protection at SO-1. SCEC also identified those modifications proposed to be deferred for consideration during the Systematic Evaluation Program (SEP). SCEC was to re-evaluate its preliminary schedule for future discussions with the NRC.

During this meeting SCEC presented its plans and schedules for implementing those modifications considered necessary to provide adequate fire protection at SO-1, until additional modifications are considered as part of the SEP.

SCEC identified the following fire protection modifications which will be accomplished during the present Cycle 7 refueling outage:

1. 12 kV Line Routing to Unit 1
2. Installation of 12 kV/480V Transformer
3. Transformer hook-up Low Side and High Side
4. DC Thermal Barrier Emergency Cooling Pump Power Cable Rerouting
5. DC Thermal Barrier Emergency Cooling Pump Control Cable Rerouting
6. Remote Manual Operation at Control Room and Local at Starter Motor to DC Thermal Barrier Emergency Cooling Pump
7. CV 722A, B and C Modification to Fail Open on Loss of Air

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8. Volume Control Tank Level Indication at Test Pump Location
9. Install Curb Around Lube Oil Reservoir and Conditioner Area
10. Drainage Modifications Under Turbine Deck
11. Install 3 Hour Self Closing Fire Door at Southwest Door of 4160-volt Switchgear Room and South Door of 480-volt Switchgear Room
12. Install Curb Around Southeast Door of 4160-volt Switchgear Room

Items 1, 2, and 3 above will provide alternate independent power for the test charging pump. This pump would be used for safe shutdown in the event of loss of the 4160V switchgear room due to a major fire. SCEC representatives stated that this alternate 480V power supply would only be maintained until the fire protection modifications in the 4160V Switchgear room have been completed. We indicated our position that the interim modifications (480V power supply for providing safe shutdown capability) be retained, or other provisions be installed to assure safe shutdown independent of the effectiveness of the 4160V switchgear room modifications. The licensee also stated that the continuous fire watch in the 4160V switchgear room would be discontinued after the 480V power supply to the test charging pump has been installed, since this would provide an independent safe shutdown capability. We indicated that area surveillance should be continued until the fire protection modifications in the 4160V switchgear room have been completed.

SCEC representatives identified the following fire protection modifications to be accomplished on an accelerated schedule independent of the SEP:

Modifications to 4160-volt Switchgear Room

1. Automatic Halon System (Double Shot)
2. Fire Detectors
3. Fire Smoke Dampers
4. Drainage Modifications
5. Hose Reel at Southeast Door

6. Penetration Seals
7. Spray Splash Shields for Switchgear

Modifications to Lube Oil Reservoir and  
Conditioner Area

1. Foam System Over Reservoir/Conditioner
2. Relocate Detectors and Add New Detectors
3. Directed Water Spray to Protect Cable Trays
4. Backup Area Sprinklers: Protection for 480-volt Switchgear Room Walls and Turbine Building Structural Steel
5. Upgrade North Wall of Turbine Building
6. Penetration Seals in North Wall
7. New East Door to 480-volt Switchgear Room (3 Hour Rating)
8. Modify Firewater Crossover Piping in Area 9A

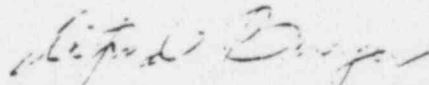
SCEC discussed its accelerated schedule for accomplishing the fire protection modification in the 4160V switchgear room and the Lube Oil Reservoir and Conditioner Area. This schedule was presented by SCEC in a handout (copy enclosed). SCEC indicated that the schedule is based on information obtained from equipment suppliers, and appropriate contingencies based on past experience. However, SCEC will not be able to develop a more reliable implementation schedule before January 1979.

The casualty procedures to be implemented following total a loss of the 4160V switchgear room, to bring SO-1 to a safe shutdown were discussed. SCEC indicated that every valve needed in these procedures can be manually operated. Credit has been taken for motor operated valves going into their fail-safe positions. We indicated the need for Piping and Instrumentation Diagrams (P&IDs) to fully understand the casualty procedures. SCEC agreed to provide such information to supplement the casualty procedures.

Prior to plant startup with the Cycle 7 Core, SCEC should provide the aforementioned information to permit our evaluation of the operability of valves required for safe shutdown including assessment of the potential spurious operation of these valves that could result from fire damage.

We believe that an hourly fire patrol may be provided, in lieu of the continuous fire watch used prior to shutdown of SO-1. Such a fire patrol should be maintained until all fire protection modifications are completed in the 4160V switchgear room and in the turbine lube oil area. A response to this position is required prior to Cycle 7 startup.

We will address the adequacy of the remaining proposed fire protection modifications and the long-term safe shutdown considerations at a later time.



Alfred Burger, Project Manager  
Operating Reactors Branch #2  
Division of Operating Reactors

Enclosures:

1. List of Attendees
2. SCEC Handout

cc: See next page

October 18, 1978

cc

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and General Counsel  
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LIST OF ATTENDEES

SCEC

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J. D. Hornbuckle  
K. P. Baskin  
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A. Burger  
L. Derderian  
T. Dunning  
R. Ferguson  
V. Panciera  
D. L. Ziemann

CASUALTY PROCEDURES TO BE IMPLEMENTED  
FOLLOWING TOTAL LOSS OF 4160V SWITCHGEAR

Hot Shutdown Sequence of Events

t=0

- 1) Loss of All A.C. Power and D.C. Control
  - Reactor Scram
  - No Saltwater or Component Cooling
  - No FW to Steam Generators
  - No Charging or Seal Water Injection
  - Seal Water Return to Volume Control Tank through RV283
- 2) Before evacuating control room, manually start D.C. Powered Thermal Barrier Emergency Pump providing cooling water to RCP leakoff to seals (CV722 A, B, C fail open).
- 3) Manually Restore Power to 480V Switchgear No. 2
- 4) Manually Start Air Compressor K1B
- 5) Manually open Saltwater cooling pump discharge valve POV6 and close POV5 (if necessary).
- 6A) Manually Restore RCP Seal cooling by starting the following equipment.
  - Saltwater cooling pump G13B
  - Component cooling pump G15B
  - MOV720A or MOV720B fail as is (1 open)
- 6B) Manually Restore Power to Auxiliary Control Panel C38
- 7) Initiate Feedwater Flow to Steam Generators by Startup of Steam Driven Auxiliary Feedwater Pump G10.
  - For Steam supply manually open valve (3" - 600-129), CV113 will automatically open for steam flow regulation.
  - For Water supply manually open valve (4" - 600-140).

t=30 minutes

- 8) Initiate Flow of Water from Reservoir to Condensate Storage tank by gravity feed through fire water system. Manually attach fire hose to fire hydrant No. 10 and open valve.

t=60 minutes

- 9) Manually startup Pressurizer Heaters if needed.
- 10) Initiate Primary Coolant Makeup from Volume Control Tank
  - MOV/LCV1100C fails as is (open).
  - FCV1115 A, B, C; PCV1115A, B, C; CV291; fail open.
  - CV410 and 411 fail closed
  - Manually close valves; (253 - 3/4" - T58), (252 - 3" - T58), (251 - 3" - T58). Startup CVCS test pump G42.



Control level in Volume Control Tank by operation of test pump using local level indication. When test pump is not in operation, seal return flow goes to Volume Control Tank through RV 283.

t= 120 minutes

- 11) Pressureizer Level and Pressure, Primary Loop Temperature, Steam Generator Level and neutron level are monitored and Steam dump is controlled from Aux. Control Panel.
- 12) The unit is in the Hot Shutdown Condition.

HOT SHUTDOWN TO COLD SHUTDOWN SEQUENCE OF EVENTS

- 1) The unit is in the Hot Shutdown Condition.
- 2) Initiate Cooldown by increased blowdown to atmosphere.
- 3) Supply Borated Water from RWST  
MOV 883 is locked open.  
Manually open MOV/LCV1100B or D  
Manually close MOV/LCV1100 C  
Startup Test Pump (if necessary).  
Makeup water is supplied through RCP seal injection flow.  
Seal water return flow is to suction of test pump.
- 4) Initiate RHR System  
When Primary Coolant characteristics reach RHR system design limits, the RHR cooling mode can be initiated as follows:  
  
MOV822A or MOV822B fail as is (1 open)  
TCV601A and TCV601B fail open  
HCV602 fail open  
MOV720A or MOV720B fail as is (1 open)  
MOV814 and MOV834 opened from switchgear 2  
MOV813 and MOV833 opened manually be entering the containment.  
Manually start RHR Pump G14B
- 5) Continued cooldown can be accomplished by appropriate control of RHR pump and test pump or by controlling flow through MOV834 until cold shutdown conditions are achieved.

PRELIMINARY FIRE PROTECTION PROJECT SCHEDULE  
FOR 4 KV ROOM & LUBE OIL RESERVOIR AREAS

