U.S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos.	50-361/90-42, 50-362/90-42
Docket Nos.	50-361, 50-362
License Nos.	NPF-10, NPF-15
Licensee:	Southern California Edison Company Irvine Operations Center 23 Parker Street Irvine, California 92718
Facility Name:	San Onofre Units 2 and 3
Enforcement Conference at:	Region V Office, Walnut Creek, California
Conference Date:	December 11, 1990
Prepared by:	David L. Proulx, Project Inspector

Approved By: P. H. Johnson, Chief, Reactor Projects Section 3 — 12/19/90, Date Signed

Summary

An enforcement conference was held on December 11, 1990 to discuss the circumstances and apparent violations associated with (1) inoperability of the steam driven auxiliary feedwater pump (SDAFWP) in Unit 2 and (2) a mis-positioned containment sump outlet valve in Unit 3 which resulted in inoperability of one train of emergency core cooling systems (ECCS) and containment spray, and caused degradation of containment integrity.

DETAILS

1. Meeting Participants

Nuclear Regulatory Commission

J. B. Martin, Regional Administrator
R. P. Zimmerman, Director, Division of Reactor Safety and Projects
A. D. Johnson, Regional Enforcement Officer
M. D. Blume, Regional Counsel
S. A. Richards, Chief, Reactor Projects Branch
P. H. Johnson, Chief, Reactor Projects Section 3
F. R. Huey, Chief, Engineering Section
C. W. Caldwell, Senior Resident Inspector
L. E. Kokajko, Units 2 and 3 Project Manager, NRR
A. L. Hon, Resident Inspector, San Onofre
D. L. Proulx, Project Inspector

Southern California Edison Company

H. B. Ray, Senior Vice President, Nuclear
H. E. Morgan, Vice President and Site Manager
B. Katz, Manager, Nuclear Oversight
J. T. Reilly, Manager, Nuclear Engineering and Construction
R. M. Rosenblum, Manager, Nuclear Regulatory Affairs
R. W. Waldo, Operations Manager
M. P. Short, Technical Manager
R. G. Lacy, Manager, Nuclear, San Diego Gas & Electric
L. D. Brevig, Supervisor, Onsite Nuclear Licensing

2. Management Discussion

On December 11, 1990, an enforcement conference was held at the Region V office in Walnut Creek, California. The purpose of this meeting was to discuss the circumstances and apparent violations associated with (1) inoperability of the steam driven auxiliary feedwater pump (SDAFWP) in Unit 2 and (2) a mispositioned containment sump outlet valve in Unit 3 which resulted in inoperability of one train of emergency core cooling systems (ECCS) and containment spray, and also caused degradation of containment integrity, as described in Report Nos. 50-361/90-37 and 50-362/90-37.

The enforcement conference convened at 9:30 a.m.

Mr. Martin presented opening remarks stating that the purpose of the conference was to ensure that the facts related to the two events are accurately presented in the associated inspection report, and to allow for additional dialogue on corrective actions taken or planned by the licensee.

Mr. Zimmerman indicated that the apparent violations were of particular concern to the NRC because they were indications of weaknesses in fundamental aspects of power plant operation. Specifically, (1) a number of corrective action and root cause program deficiencies resulted in several missed opportunities to identify the inoperability of a key, safety related component (SDAFWP), and (2) control room operators were not fully knowledgeable of plant status information available on the control room panels.

Mr. P. Johnson then discussed the chronology, details, and apparent violations associated with the events described above.

3. Licensee Position

Mr. Rosenblum stated that the licensee agreed in principle with almost all of the facts and conclusions presented in the inspection report. However, he referred the attendees to pages 9 and 16 of the inspection report for two comments. He asserted that Technical Specifications (TS) paragraph 3.8.1.1, Action statement c.2, did not appear to have been violated as stated on page 9 of the NRC inspection report. This TS states that if one emergency diesel generator (EDG) is inoperable, then the steam driven auxiliary feed pump (SDAFWP) shall be verified operable. Although an EDG was taken out of service while the SDAFWP was inoperable, it was SCE's position that they would not have removed the EDG from service if they had known that the SDAFWP was inoperable. In addition, the verification (of SDAFWP operability) required by the Action statement consists of a status review, and does not involve operating the SDAFWP. Therefore, he continued, SCE disagreed with the NRC's assertion that TS 3.8.1.1, action statement c.2 was apparently violated. Mr. Zimmerman acknowledged the comment, and indicated that the NRC would evaluate the licensee's position.

Mr. Martin commented that although SCE did not knowingly deviate from the TS in this case, inoperability of the EDG was of safety significance because this could have caused both the turbine driven and motor driven auxiliary feed pumps to be out of service at the same time.

Secondly, Mr. Rosenblum stated that SCE did not totally agree with the NRC's conclusion on page 16 of the inspection report (second item under paragraph f). This item asserted that the approved omission of certain steps (associated with reestablishing condenser vacuum) from the startup procedure did not receive sufficient review. SCE recognized that other procedures should have provided for proper realignment of the steam traps, but considered the decision to omit certain steps from the startup procedure to have been correct.

Mr. P. Johnson acknowledged this comment, noting that the procedure weakness (in the steam generator drain and refill procedure) was accurately stated in paragraph 4.e of the report. He concurred that while the omitted steps had provided for proper realignment of the traps on previous occasions, their omission in this case did not appear to be inappropriate. He noted that, as discussed in paragraph 4.e., the nitrogen blanketing procedure should have provided for proper trap realignment.

4. Discussion of Apparent Violation Associated with Inoperability of the Steam Driven Auxiliary Feedwater Pump (SDAFWP)

Mr. Waldo presented SCE's discussion of the causes of the problem, and corrective actions completed and to be taken. A copy of slides used during his discussion is included as an attachment to this report.

Mr. Johnson referred to the missed opportunity to find the root cause when the other steam trap for Unit 2 was found isolated. In particular, he asked whether a nonconformance report (NCR) was generated when this problem was discovered.

Mr. Reilly replied that a NCR was not generated because the steam traps were not considered safety-related. Mr. Ray stated that if improper alignment of steam traps affects auxiliary feed pump turbine performance, then the steam traps should be designated safety-related. He then stated that more formal controls over these steam traps are needed, and suggested that the station staff evaluate whether the trap isolation valves should be locked open during normal operation.

Mr. Reilly added that normally these turbines are designed to tolerate more condensate in the steam lines without tripping on overspeed. A possible exacerbating factor in this case is that the trip setting of the turbine is only 10% above rated speed. He stated that SCE will evaluate whether a design change is appropriate to raise the SDAFWP overspeed trip setting. Mr. Ray agreed that this evaluation would be undertaken.

Mr. Waldo concluded his presentation with a description of the completed and planned corrective actions for this occurrence, as listed in the attachment to this report. Fourteen of 17 identified corrective actions had been completed at the time of the conference.

5. Discussion of the Apparent Violation Associated with the Mispositioned Containment Sump Valve

Mr. Waldo presented SCE's discussion of the direct causes of this problem, and root causes of the overall event. A copy of slides used during his discussion is included as an attachment to this report.

Mr. P. Johnson and Mr. Hon then commented on the perceived heavy workload assigned to control room operators -- e.g., surveillance tests and equipment control tasks -- which appeared to detract from routine monitoring of panel indications and plant conditions.

Mr. Ray and Mr. Waldo agreed, and stated that an evaluation of control room operator activities would be conducted. However, they felt that the operators could also have discovered the problem through routine status checks and review of printouts of the plant computer (also known as the plant monitoring system, or PMS). Mr. Waldo noted, however, that the printout contains so much information that it may not be useful to help identify problems quickly. He further stated that actions will be taken to make the PMS printout a useful tool.

Mr. Zimmerman pointed out that at many other sites, the plant computer is quite useful in aiding the operators in monitoring plant status.

Mr. Ray acknowledged Mr. Zimmerman's observation and stated that SCE will survey other plants to get information on how the plant computer is employed elsewhere.

Mr. Waldo then described completed and pending licensee corrective actions and actions to provide for more prompt identification of deficient alignments, as outlined in the attachment to this report. For the mispositioned containment sump valve, 10 of 19 planned corrective actions had been completed at the time of the enforcement conference.

6. Closing Remarks

Mr. Martin concluded by stating that the two principal issues of concern for this conference were fundamental to safe operation of a power plant. The first issue involved management's failure to ensure that the cause of the overspeed trips of the AFW pump was determined prior to returning the pump to service. The second fundamental issue, management failure to ensure that the operators are focused primarily on plant conditions, caused the open containment sump outlet valve to remain open undetected for four days, and apparently contributed to extended inoperability of the SDAFWP.

Mr. Martin noted that seven years ago, San Onofre had experienced the types of programmatic problems described in this report, and that the occurrence of these types of problems now is of substantial concern to Region V. He observed that San Onofre had gradually improved to an overall good performer about two years ago, but is perceived to have declined somewhat since that time. Mr. Martin commented that these two events demonstrated a weakness in communications at San Onofre and that this weakness, accompanied by the other negative elements mentioned earlier, can result in performance that continues to decline, unless aggressive corrective actions are instituted.

Mr. Martin adjourned the meeting at 12:45 p.m.

Attachment: Copy of slides used during the licensee's discussions.

Enclosure 1

ENFORCEMENT CONFERENCE WITH

SOUTHERN CALIFORNIA EDISON COMPANY

San Onofre Nuclear Generating Station

December 11, 1990

AGENDA

1. Opening Remarks, Purpose of Meeting -- J. B. Martin, Regional Administrator, and H. B. Ray, Senior Vice President, Nuclear

2. Discussion of Significant Violations of Technical Specification Requirements for Safety Related Equipment -- P. Johnson, Chief, Reactor Projects Section III

3. Response by Edison Staff

4. NRC Comments and Discussion

5. Review of Enforcement Policy -- A. D. Johnson, Enforcement Officer

6. Closing remarks -- J. B. Martin, Regional Administrator, and H. B. Ray, Senior Vice President, Nuclear

AGENDA

- EVENTS AND THEIR DIRECT CAUSES
- CORRECTIVE ACTION UPDATE
- UNDERLYING CONTRIBUTOR
- SAFETY SIGNIFICANCE
- INSPECTION REPORT CLARIFICATIONS
- CONCLUDING REMARKS

MISALIGNMENT OF TRAP ISOLATION VALVE AUXILIARY FEEDWATER PUMP 2P-140

CAUSE DISCUSSION

OUTLINE OF EVENT

- PLANT IN MODE 3 TO REPAIR SG FEEDRING - VACUUM PRESERVED
- N_2 BLANKET ALIGNMENT PERFORMED - TRAP VALVES CLOSED
- N_2 BLANKET REMOVAL ALIGNMENT PERFORMED
- ENTERED MAIN STEAM LINE ALIGNMENT PROCEDURE AT POINT THAT VACUUM IS ESTABLISHED
- 2P-140 SATISFACTORILY TESTED - PLANT ENTERS OPERATION
- 2P-140 EXPERIENCES OVERSPEED TRIPS

DIRECT CAUSES

- SG N_2 BLANKET PROCEDURE DID NOT
  - REALIGN TRAP VALVES, OR
  - ENSURE VALVE REALIGNMENT WAS ACCOMPLISHED THROUGH OTHER PROCEDURAL ACTIONS

MISSED OPPORTUNITIES

- PROCEDURES PERMITTED MANUAL CONDENSATE REMOVAL PRIOR TO ROUTINE PUMP TESTING
- COMPANION TRAP VALVE ON OPPOSITE STEAM HEADER FOUND CLOSED PRIOR TO TRIPPING EVENTS
- ROUTINE PLANT MONITORING DID NOT DETECT MISALIGNMENT
- EARLY INVESTIGATION EFFORTS FAILED TO DISCOVER CLOSED VALVE

MISALIGNMENT OF TRAP ISOLATION VALVE AUXILIARY FEEDWATER PUMP 2P-140

CORRECTIVE ACTIONS - COMPLETED

- PERIODIC CHECK OF AFW TURBINE STEAM LINE TRAPS AND DRAINS

- STEAM LINE TRAPS AND DRAINS CHECKED AFTER EACH MONTHLY PUMP TEST

- APPROPRIATE PROCEDURES REVISED TO ENSURE VALVES ARE REPOSITIONED FOLLOWING EVOLUTIONS

- PROCEDURE WRITER'S GUIDE AMENDED TO PROVIDE GUIDANCE TO AUTHORS TO DIRECT REALIGNMENT OF VALVES FOLLOWING EVOLUTIONS

- THIS EVENT HAS BEEN REVIEWED WITH OPERATIONS PERSONNEL

- PROCEDURES REVISED TO DIRECT OPERABILITY ASSESSMENT FOLLOWING DISCOVERY OF FUTURE VALVE MISALIGNMENTS

- ENGINEERING PERSONNEL REVIEWED THIS EVENT, EMPHASIZING:

    - formality of communications and follow-up during investigations

MISALIGNMENT OF TRAP ISOLATION VALVE AUXILIARY FEEDWATER PUMP 2P-140

CORRECTIVE ACTIONS - PLANNED

- PEO ROUNDS WILL BE OPTIMIZED, DIRECTED AT BROADER RANGE OF EQUIPMENT

- REVIEW METHODS TO REDUCE AFW PUMP TURBINE VULNERABILITY TO WATE.. INGRESS (e.g., REVISION OF OVERSPEED TRIP SETPOINT)

MISALIGNMENT OF TRAP ISOLATION VALVE AUXILIARY FEEDWATER PUMP 2P-140

CORRECTIVE ACTIONS - STATUS

- 17 Corrective Actions Identified

- 4 Corrective Actions Completed

CONTAINMENT SUMP VALVE MISALIGNMENT

CAUSE DISCUSSION

OUTLINE OF EVENT

- WORKER DISCUSSES LABEL REPLACEMENT IN AUXILIARY RELAY CABINET WITH SS AND CRS
- WORKER INADVERTENTLY BUMPS CIRCUIT BREAKER WHILE REPLACING LABEL (SUMP VALVE OPENS)
- WORKER RESETS BREAKER - REQUESTS CR OPERATOR TO CHECK CABINET STATUS
- CABINET STATUS VERIFIED SATISFACTORY BY CR OPERATORS
- MISALIGNMENT DETECTED DURING EQUIPMENT STATUS MONITORING

DIRECT CAUSES

- INAPPROPRIATE AUTHORIZATION OF WORK ACTIVITY ON CRITICAL EQUIPMENT
- INADEQUATE SUPERVISION OF ACTIVITY
- POOR COMMUNICATION BETWEEN WORKER AND CR OPERATORS
- DESIGN DOES NOT PROVIDE ANNUNCIATION OF MISALIGNMENT OF CRITICAL COMPONENT

MISSED OPPORTUNITIES

- ROUTINE PLANT STATUS MONITORING DID NOT DETECT PROBLEM FOR 4 DAYS
- PLANT COMPUTER ENTRIES NOT CONDUCIVE TO MEANINGFUL ROUTINE REVIEW

CONTAINMENT SUMP VALVE MISALIGNMENT

CORRECTIVE ACTIONS - COMPLETED

- INSIDE AND OUTSIDE SUMP VALVES ARE VERIFIED CLOSED ON SHIFTLY BASIS

- CONTROL ROOM POLICIES AND PROCEDURES FOR ON-SHIFT MONITORING OF EQUIPMENT STATUS HAVE BEEN IMPROVED

- ACTION REQUIREMENTS OF ECCS TECHNICAL SPECIFICATION WILL BE APPLIED TO SUMP VALVES AND MINIFLOW VALVES (TECH SPEC CHANGE TO BE SUBMITTED TO SPECIFICALLY ADDRESS THESE VALVES)

- PROCEDURES HAVE BEEN ENHANCED TO PROVIDE ADDED LEVEL OF CONTROL FOR WORK ON CRITICAL PLANT EQUIPMENT

- THIS EVENT HAS BEEN REVIEWED WITH OPERATIONS PERSONNEL

- ALL PLANT PERSONNEL HAVE BEEN REMINDED OF OBLIGATIONS REGARDING OPERATION OF PLANT EQUIPMENT AND NOTIFICATION OF CONTROL ROOM OF INADVERTENT EQUIPMENT MANIPULATION

CONTAINMENT SUMP VALVE MISALIGNMENT

CORRECTIVE ACTIONS - PLANNED

- PROVIDE AUDIBLE ALARM FOR MISALIGNED SUMP VALVES AND ECCS AND CS MINIFLOW VALVES
  - utilize existing plant capabilities - Spring 1991
  - evaluate long term improvements
- EVALUATE OTHER CRITICAL VALVES FOR SIMILAR ANNUNCIATION
  - Complete Evaluation - 3rd Qtr. 1991
- EVALUATE OPTIMUM POSITION OF INSIDE SUMP VALVE
  - Complete Evaluation - 1991

CONTAINMENT SUMP VALVE MISALIGNMENT

CORRECTIVE ACTIONS - STATUS

- 19 Corrective Actions Identified

- 10 Corrective Actions Completed