



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-8064

MAR 6 1996

Southern California Edison Co.  
San Onofre Nuclear Generating Station  
ATTN: Harold B. Ray  
Executive Vice President  
P.O. Box 128  
San Clemente, California 92674-0128

SUBJECT: NRC INSPECTION REPORT 50-361/95-16; 50-362/95-16

Your letter of November 3, 1995, provided additional information concerning issues documented in the subject inspection report. We have reviewed your additional information and have determined additional clarification is appropriate.

Regarding the issues discussed in Sections 5.2.2 and 5.2.3 of the subject inspection report, we have determined that certain clarifications of the record are appropriate. Accordingly, pages 16 and 17 of the subject report have been revised and are attached. Please replace the existing pages 16 and 17 with the attached pages 16 and 17. Each existing page is to be replaced by the page marked with a diagonal and the revised page.

With regard to the issue documented in Section 5.2.1, we maintain that a similar failure mode for three of the four RWST outlet valves provides sufficient evidence that failure for these valves was clearly higher than expected and that the preventive maintenance program for these valves was, clearly, not optimized. This issue was inspected more fully during our most recent inspection period and documented in NRC Inspection Report 50-361/95-30; 50-362/95-30, Section 6.1. This report documents additional motor-operated valve failures which were, at least partially, the result of preventive maintenance deficiencies. Accordingly, we remain concerned regarding the ability of your motor-operated valve preventive maintenance program to preclude valve failures of the type which may be partially the result of preventive maintenance deficiencies. This item is being carried as an open item pending further review and will be dispositioned in a future inspection report.

Should you have any questions concerning this letter, we will be pleased to discuss them with you.

Sincerely,

A handwritten signature in cursive script, appearing to read "J. E. Dyer".

J. E. Dyer, Director  
Division of Reactor Projects

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PDR ADOCK 05000361  
G PDR

Dockets: 50-361  
50-362  
Licenses: NPF-10  
NPF-15

Attachments: As stated

cc w/attachments:  
County of San Diego  
ATTN: Chairman, Board of Supervisors  
1600 Pacific Highway, Room 335  
San Diego, California 92101

Rourke & Woodruff  
ATTN: Alan R. Watts, Esq.  
701 S. Parker St. No. 7000  
Orange, California 92668-4702

Public Utilities Department  
City of Riverside  
ATTN: Sherwin Harris, Resource  
Project Manager  
3900 Main Street  
Riverside, California 92522

Southern California Edison Company  
San Onofre Nuclear Generating Station  
ATTN: R. W. Krieger, Vice President  
P.O. Box 128  
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California Department of Health Services  
ATTN: Dr. Harvey Collins, Chief  
Division of Drinking Water and  
Environmental Management  
P.O. Box 942732  
Sacramento, California 94234-7320

San Diego Gas & Electric Company  
ATTN: Richard Krumvieda, Manager  
Nuclear Department  
P.O. Box 1831  
San Diego, California 92112

Radiological Health Branch  
State Department of Health Services  
ATTN: Mr. Steve Hsu  
P.O. Box 942732  
Sacramento, California 94234

City of San Clemente  
ATTN: Mayor  
100 Avenida Presidio  
San Clemente, California 92672

Southern California Edison Company -4-

E-Mail report to D. Nelson (DJN)  
E-Mail report to NRR Event Tracking System (IPAS)

bcc to DMB (IE01)

bcc distrib. by RIV:

L. J. Callan	Resident Inspector
DRP Director	DRS-PSB
Branch Chief (DRP/F, WCFO)	MIS System
Senior Project Inspector (DRP/F, WCFO)	RIV File
Branch Chief (DRP/TSS)	M. Hammond (PAO, WCFO)
Leah Tremper (OC/LFDCB, MS: TWFN 9E10)	

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JASloan <i>DFK by Nelson</i>	DFKirsch <i>K</i>	JEDyer <i>JML</i>			
03/1/96	03/1/96	03/6/96	02/ /96	02/ /96	

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Southern California Edison Company -4-

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02/1/96	03/1/96	03/6/96	02/ /96	02/ /96

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The inspector emphasized to licensee management that the above two examples were instances in which plant modifications were implemented, but applicable procedures were not appropriately revised to recognize the modifications.

## 5.2 Missed Opportunities to Correct Repetitive Equipment Problems

The inspectors noted several recent examples of repetitive equipment problems which appear to represent missed opportunities for the licensee to have thoroughly understood and corrected the full scope of the involved problems when they initially occurred. Specific examples included:

### 5.2.1 Safety-Related Valve Motor Actuator Failures

Since May 1995, the licensee has identified failures of motor-operated valves, and significant degradation of a valve. Unit 3 refueling water storage tank (RWST) outlet Isolation Valve 3HV9301 failed during valve testing, and failures of the outlet isolation valves for the other Unit 3 RWST and for one Unit 2 RWST were documented in NRC Inspection Report 50-361/95-07. These failures were caused by motor actuator problems. The inspector considered the incidence of failure of safety-related valves in general to be higher than expected, and noted that additional attention to the root cause of these failures appeared to be warranted.

### 5.2.2 WKM Valve Failures

During plant cooldown at the beginning of the Unit 3 Cycle 8 refueling outage, the licensee observed that SDC Valve 3HV9339 would not open more than 75 percent. The problem was determined to be caused by a broken rail inside the valve, and not a motor actuator problem. The valve, manufactured by WKM, was a 16-inch dual disk lever-lock valve. Previous similar problems had been experienced by the licensee on hydraulically-actuated main steam isolation valves. The licensee had determined, based principally on a third-party engineering evaluation, that the corrective actions taken for the main steam isolation valves did not need to be implemented on any motor-operated valves, because the motor-operated valves had a slower stroke velocity, which was considered a major contributing factor to the failures. The number of cycles was also a factor, and as the SDC valves were not frequently operated, they were not considered to be susceptible to the same failure mechanism. At the close of the inspection period, the licensee had not determined why this valve failed. The licensee inspected some other valves with very low or higher susceptibility to failure and found them all to be in good condition. One possibility the licensee considered was that a preexisting flaw in Valve 3HV9339 may have made it more susceptible to failure than other similar valves. However, in light of the failure of Valve 3HV9339, the licensee made modifications to the valve internals and was considering prudent preventative actions for other WKM valves.

The inspector concluded that the licensee had thoroughly evaluated and corrected the recent failure of Valve 3HV9339, but previously may not have accurately assessed the susceptibility of the WKM SDC valves to the failure of

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### 5.2.3 RCP 3P002 Baffle Bolt Failure

During the Unit 3 Cycle 8 refueling outage, the licensee investigated anomalous vibration phase angle shifts observed in RCP 3P002 during the operating cycle. While the vibration magnitude increased modestly (about 2.5 mils), the phase angle increased markedly during the cycle. Upon disassembly and inspection of the pump during the outage, the licensee identified that five of the six cap screws securing the seal cooler baffle were broken as a result of fatigue failure, and that the baffle was cocked inside the heat exchanger, rubbing at the lowest point.

The licensee determined that the bolt failure occurred due to a loss of preload on the bolts. A high-vibration event at the end of the Cycle 7 refueling outage may have contributed to the condition. Additionally, the licensee found that the alignment of the holes in the baffle with the mounting holes was imperfect, which could have resulted in the bolt heads being slightly cocked, substantially increasing the stresses at the head. The seating surface of the baffle was also found to be not uniform, and vibration could cause high spots to wear down, resulting in a loss of bolt preload.

The licensee discussed its analysis and actions in a meeting with NRC management in Region IV on August 23, 1995. During the meeting, the licensee discussed the effectiveness of corrective actions for the previous events during which baffle bolts were found loose or broken. As a result of the current situation, the licensee replaced the baffle and bolts. Additionally, the licensee verified that the torque on the baffle bolts in the three other RCPs in Unit 3 was adequate.

The inspector concluded that the licensee's recent engineering actions in monitoring and inspecting the RCP, identifying and evaluating the deficiencies, and determining appropriate corrective actions, were excellent. However, the inspector also noted that more thorough engineering attention following previous occurrences of RCP baffle bolt failures may have prevented the most recent problem.

## 6 PLANT SUPPORT ACTIVITIES (71750)

### 6.1 Radiological Controls

#### 6.1.1 Cigarettes Found in Radiologically Controlled Area

On August 8, 1995, the inspector observed a maintenance worker performing pipe support modifications associated with high pressure safety injection Pump 3P018 in the Unit 3 safety equipment building. The worker's hard hat was on the floor and contained a package of cigarettes, contrary to licensee policy. There was no evidence that the worker had been smoking inside the radiologically controlled area. Upon notification, licensee Health Physics

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