

*Southern California Edison Company*

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VICE PRESIDENT  
NUCLEAR GENERATION

February 22, 1994

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714-368-6255

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

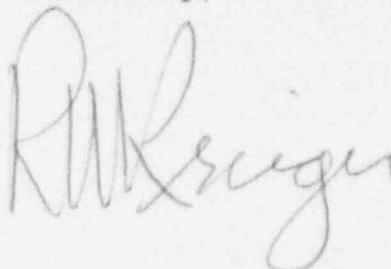
Subject: Docket No. 50-362  
Supplemental Report  
Licensee Event Report No. 93-005, Revision 1  
San Onofre Nuclear Generating Station, Unit 3

Reference: Letter, R. W. Krieger (SCE) to USNRC Document  
Control Desk, dated December 30, 1993

The referenced letter provided Licensee Event Report (LER) No. 93-005, for an occurrence involving an inoperable containment isolation valve. The enclosed supplemental LER provides additional information regarding this occurrence. Neither the health nor the safety of plant personnel or the public was affected by this occurrence.

If you require any additional information, please so advise.

Sincerely,



Enclosure: LER No. 93-005, Rev. 1

cc: B. H. Faulkenberry (Regional Administrator, USNRC Region V)  
J. Sloan (USNRC Senior Resident Inspector, Units 1, 2 and 3)  
M. B. Fields, NRC Project Manager, San Onofre Units 2 & 3  
Institute of Nuclear Power Operations (INPO)

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LICENSEE EVENT REPORT (LER)

Facility Name (1) SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 3  
 Docket Number (2) 0 5 | 0 | 0 | 0 | 3 | 6 | 2  
 Page (3) 1 of 0 3  
 Title (4) Inoperable Containment Isolation Valve

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
Month	Day	Year	Year	/// ///	Sequential Number	/// ///	Revision Number	Month	Day	Year	Facility Names	Docket Number(s)
1	1	3	0	9	3	9	3	---	0	0	5	---
					0	0	5		0	1	0	2
									1	8	9	4
											NONE	0 5   0   0   0
												0 5   0   0   0

OPERATING MODE (9) 6  
 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)  

POWER LEVEL (10) 0   0   0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	Other (Specify in Abstract below and in text)
	20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name R. W. Krieger, Vice President, Nuclear Generation  
 TELEPHONE NUMBER AREA CODE 7 | 1 | 4 | 3 | 6 | 8 | - | 6 | 2 | 5 | 5

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS
D	C   C	I   S   V	W   2   5   5	N					

SUPPLEMENTAL REPORT EXPECTED (14)

Expected Submission Date (15) Month Day Year  
 Yes (If yes, complete EXPECTED SUBMISSION DATE)  NO

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On November 30, 1993, with Unit 3 in Mode 6 at 0% power, Edison completed an evaluation of a Non-Conformance Report for Train A Component Cooling Water System (CCW)[CC] valve 3HV6371. During Motor Operated Valve Analysis and Test System (MOVATS) testing in April 1992, Edison had noted high running current for 3HV6371, and had scheduled the valve for maintenance during the next refueling outage. Prior to completing this maintenance, during a stroke test on January 19, 1993, 3HV6371 failed to open. The valve had been successfully passing its quarterly surveillance testing, including the last test (November 1992) before it failed in January 1993. In accordance with Technical Specification (TS) 3.6.3, "Containment Isolation Valves," the valve was secured in its safety related actuated position (open). When the valve was disassembled during the Cycle 7 refueling outage starting in November 1993, 3HV6371 was found to be incorrectly assembled. Specifically the upstream valve skirt was inverted. Therefore, Edison has conservatively concluded that 3HV6371 was inoperable in excess of the out of service time limits of TS 3.6.2.3 and TS 3.6.3 and therefore is reportable in accordance with 10CFR50.73(a)(2)(i)(B).

The cause of the inoperability of 3HV6371 was the inverted upstream skirt which ultimately lead to the January 19, 1993 failure of the valve. 3HV6371 was correctly assembled, tested and determined operable during the Cycle 7 refueling outage in November 1993. Separate from this event, in January 1990, Edison upgraded the training provided for this type of valve, and, in July 1990, upgraded the associated maintenance procedure.

\*Edison has confirmed that sufficient containment cooling components were operable to ensure containment pressure and temperature design limits could be maintained. Therefore, there was minimal safety significance to this event.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION	DOCKET NUMBER	LER NUMBER	PAGE
UNIT 3	05000362	93-005-01	2 of 3

Plant: San Onofre Nuclear Generating Station  
Unit: Three  
Reactor Vendor: Combustion Engineering  
Event Date: 11-24-93

## DESCRIPTION OF THE EVENT:

On November 30, 1993, with Unit 3 in Mode 6 at 0% power, Edison completed an evaluation of a Non-Conformance Report for Train A Component Cooling Water System (CCW)[CC] valve 3HV6371. Unit 3 has two trains of Containment Emergency Coolers (CEC)[BK] with two coolers in each train (a total of four coolers). Each cooler has one associated supply and one return isolation valve. These valves are containment isolation valves. 3HV6371 is a containment isolation valve (CIV)[ISV] in a CCW return line from one of the two Train A CEC loops. The return valves are normally shut, opening on a Containment Cooling Actuation Signal (CCAS)[JE].

During Motor Operated Valve Analysis and Test System (MOVATS) testing in April 1992, Edison had noted high running current for 3HV6371, and had scheduled the valve for maintenance during the next refueling outage. Prior to completing this maintenance, during a stroke test on January 19, 1993, 3HV6371 failed to open. The valve had been successfully passing its quarterly surveillance testing, including the last test (November 1992) before it failed in January 1993. In accordance with Technical Specification (TS) 3.6.3, "Containment Isolation Valves," the valve was secured in its safety related actuated position (open). When the valve was disassembled during the Cycle 7 refueling outage starting in November 1993, 3HV6371 was found to be incorrectly assembled. Specifically the upstream valve skirt was inverted.

Optimum operation of WKM Model D-2 gate valves is dependant upon proper installation of the upstream and downstream valve skirts. With the upstream valve skirt for 3HV6371 inverted, the valve was subject to accelerated wear (galling). Therefore, Edison has conservatively concluded that 3HV6371 was inoperable in excess of the out of service time limits of TS 3.6.2.3 and TS 3.6.3 and therefore is reportable in accordance with 10CFR50.73(a)(2)(i)(B).

## CAUSE OF THE EVENT:

The cause of the inoperability of 3HV6371 was the inverted upstream skirt which caused inappropriate contact between valve internal components, ultimately leading to the January 19, 1993 failure of the valve.

3HV6371 was disassembled and reassembled only once following the original installation. Specifically, during the Cycle 4 refueling outage in June 1988, the valve was disassembled and reassembled using match marking of valve components. Following a review of maintenance records and discussions with the individuals involved, Edison was unable to confirm if the valve skirt was inverted during the June 1988 maintenance. However, based upon a review of MOVATS traces for all 16 WKM CEC CIV's, Edison has hypothesized that the upstream skirt may have been inadvertently mis-installed during the June 1988 maintenance.

In 1988, the procedure for performing maintenance on WKM valves was based on the WKM instruction manual. However, in 1990, after noting the complexity of reassembly for the WKM D-2 valves, it was determined the vendor instruction manual did not provide sufficient guidance to ensure proper reinstallation of valve components. Assuming that the mis-assembly occurred in 1988 as hypothesized, the cause of this mis-assembly is considered to be inappropriate instructions in the procedure (taken from the vendor instruction manual).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION UNIT 3	DOCKET NUMBER 05000362	LER NUMBER 93-005-01	PAGE 3 of 3
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CORRECTIVE ACTIONS:

3HV6371 was correctly assembled, tested and determined operable during the Cycle 7 refueling outage in November 1993.

Edison re-evaluated the MOVATS testing and trace analyses for the other 15 WKM Model D-2 valves installed in the CEC's, and based on this review, Edison believes these valves are correctly assembled (no inverted flow skirts). In addition, these valves continue to pass their surveillance stroke testing. Edison also evaluated the MOVATS testing and trace analyses of other similar WKM valves with the same results.

Separate from this event, after noting the complexity of reassembly for the WKM D-2 valves, in January 1990, Edison upgraded the training provided for this type of valve to include hands on instruction using an actual WKM Model D-2 valve. This training was also enhanced to include proper techniques for match marking and valve reassembly. Additionally, in July 1990, after observing that the vendor manual did not provide sufficient guidance to ensure proper reinstallation of valve components, Edison upgraded maintenance procedure SO123-I-6.75 to provide this guidance. The maintenance procedure was further upgraded to provide enhanced guidance for proper match marking of valve components during disassembly.

Edison will incorporate this incident into the Continuing Maintenance Training Program.

SAFETY SIGNIFICANCE OF THE EVENT:

As previously discussed, San Onofre Units 2 and 3 each have two trains of emergency containment cooling systems. Each train has one containment spray header (CS) [BE] and two loops of containment emergency coolers. Thus, there are six individual components between Train A and Train B that can provide post accident containment cooling as follows:

- | Train A                  | Train B                  |
|--------------------------|--------------------------|
| 1) Containment Spray     | 4) Containment Spray     |
| 2) Emergency Cooler E399 | 5) Emergency Cooler E400 |
| 3) Emergency Cooler E401 | 6) Emergency Cooler E402 |

Best estimate calculations completed for Edison's Individual Plant Examination (IPE) concluded that any one of the above six components is sufficient to ensure containment pressure and temperature design limits can be maintained.

Prior to January 1993, with the upstream valve skirt inverted, the valve was subject to increased stress and accelerated wear. Edison believes the valve became inoperable sometime prior to its failure on January 19, 1993. However, Edison has confirmed that sufficient containment cooling components were operable to ensure containment pressure and temperature design limits could be maintained. Therefore, there was minimal safety significance to this event.

ADDITIONAL INFORMATION:

The following previous LER's involved the incorrect assembly of components:

LER 90-15 (Docket 50-361) reported the incorrect installation of the Gravity Feed Lube Oil supply line to the motor of Auxiliary Feedwater Pump P-504 motor. The supply line was installed in the wrong bearing location.

LER 91-13 (Docket 50-206) reported the mis-assembly of the 4160 Volt Room Halon System Actuation Line.

Common contributing factors for the above incidents were inadequate match marking and the omission of necessary procedural guidance. Following the Gravity Feed Lube Oil incident, instruction on match marking was added to all mechanical lesson plans by the Edison Nuclear Training Division.

Because the incorrect assembly of 3HV6371 preceded the above occurrences, corrective actions for these occurrences could not have prevented this occurrence.