SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

R. W. Krieger
Vice President
Nuclear Generation

October 28, 1996

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

Subject: Docket No. 50-362
30 Day Report
Licensee Event Report No. 96-005
San Onofre Nuclear Generating Station, Unit 3

This submittal provides a written Licensee Event Report (LER) to report the mispositioning of a flow restricting valve in the reactor head vent system. Neither the health nor the safety of plant personnel or the public was affected by this occurrence.

Sincerely,

Enclosure: LER No. 96-005

cc: L. J. Callan, Regional Administrator, NRC Region IV
J. E. Dyer, Director, Division of Reactor Projects, NRC Region IV
K. E. Perkins, Jr., Director, Walnut Creek Field Office, NRC Region IV
J. A. Sloan, NRC Senior Resident Inspector, San Onofre Units 2 & 3
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LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 3	0 5 0 0 0 3 6 2	1 of 0 5

Title (4)
Reactor Head Vent Valve Mispositioned

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)
				---		---					NONE	0 5 0 0 0
0 9	2 8	9 6	9 6		0 0 5		0 0	1 0	2 8	9 6		0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)					
5	___ 20.402(b)	___ 20.405(c)	___ 50.73(a)(2)(iv)	___ 73.71(b)		
POWER LEVEL (10) 0 0 0	___ 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)	___ 50.73(a)(2)(I)	___ 50.73(a)(2)(viii)(A)			
	___ 20.405(a)(1)(iv)	XX 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	TELEPHONE NUMBER
	AREA CODE
R. W. Krieger, Vice President, Nuclear Generation	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	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

San Onofre Units 2 and 3 are each provided with a Reactor Coolant Gas Vent System (RCGVS). During the last refueling outage for each unit, the flow restricting orifice (0.188 flow diameter) in the RCGVS reactor head vent line was replaced with a one inch gate valve with a 0.188 inch hole drilled through the valve disc (valve MU995). When closed, this valve performs an identical function as the flow restricting orifice. When opened, the presence of the valve precludes the operational need to first remove and later re-install the flow restricting orifice during refueling outages.

On 9/28/96, at 0200, during preparations to drain the Unit 3 reactor coolant system (RCS) to mid-loop, the operator performing the required valve alignments found MU995 open. Edison immediately reviewed plant records and discovered that MU995 had not been closed at the end of the last refueling outage (9/95). Edison confirmed that the plant always remained bounded by existing accident analyses and the plant was not significantly affected by MU995 being left open. However, with MU995 open, it did not provide the flow restricting ability for the RCGVS reactor head vent line as discussed in UFSAR Section 9.3.7 Consequently, Edison is submitting this report in accordance with 10CFR50.73(a)(2)(ii) due to the interest in FSAR discrepancies.

The misposition was caused by the incorrect completion of the RCS post-fill valve alignment procedure (cognitive personnel error). Edison confirmed by a review of plant records that the corresponding Unit 2 valve was closed. Edison has implemented appropriate disciplinary action against the responsible control room supervisor and will review this occurrence with all operating crews.

Edison is reviewing major alignment procedures to ensure suitable second-checking is implemented. Additionally, Edison is developing a list of valves inside containment which will be checked prior to closing containment after an outage.

Plant: San Onofre Nuclear Generating Station, Unit 3
Reactor Vendor: Combustion Engineering
Date of Discovery: September 28, 1996
Time of Discovery: 0200
Mode: 5, Cold Shutdown
Pressure: atmospheric
Temperature: approximately 119 degrees F

BACKGROUND:

San Onofre Units 2 and 3 are each provided with a Reactor Coolant Gas Vent System (RCGVS). If certain non-design basis events were to occur and generate non-condensable gases inside the reactor coolant system (RCS) [AB], the RCGVS would allow plant operators to vent (remove) those gases from the RCS to ensure proper coolant flow will continue unimpeded. At San Onofre, the RCGVS provides vent paths for the locations inside the RCS where non-condensable gases would naturally collect: (1) the reactor vessel [RPV] upper head, and (2) the pressurizer [PZR] steam space.

As originally designed, each vent path is a 0.75 inch (nominal) pipe with an integral flow restricting orifice [OR] (0.188 inch flow diameter), with two normally closed solenoid-operated valves [FSV] in parallel downstream of the flow restricting orifice. If either of the RCGVS lines were to break, the flow restrictors would limit the maximum flow rate through the broken line to less than the capacity of one charging pump [CB][P] (less than about 44 gpm).

The RCGVS also provides an operational convenience for draining and filling the RCS during plant outages. However, the flow restrictor in the reactor head vent line unnecessarily limits the rate of RCS fill and vent evolutions to less than optimal, and consequently, is normally removed during plant outages. However, during the last refueling outage for each unit, the flow restricting orifice in the RCGVS reactor head vent line was replaced with a one inch gate valve [V] with a 0.188 inch hole drilled through the valve disc (valve number MU995). When closed, this valve performs an identical function as the flow restricting orifice. When opened, the presence of the valve precludes the operational need to first remove and later re-install the flow restricting orifice.

DESCRIPTION OF THE EVENT:

On 9/28/96, at 0200, during preparations to drain the RCS to mid-loop, the operator performing the required valve alignments found MU995 open. Edison immediately reviewed plant records and discovered that MU995 had not been closed at the end of the last refueling outage in September 1995. As noted in the safety significance section below, Edison confirmed that the plant always remained bounded by existing accident analyses and the plant was not significantly affected by MU995 being left open. However, with MU995 open, it did not provide the flow restricting ability for the RCGVS reactor head vent line as discussed in the Updated Final Safety Analysis Report (UFSAR) Section 9.3.7. Consequently, Edison is submitting this report in accordance with 10CFR50.73(a)(2)(ii) due to the interest of FSAR discrepancies.

CAUSE OF EVENT

The misposition of MU995 was caused by the incorrect completion of the RCS post-fill valve alignment attachment to the fill and vent procedure (cognitive personnel error). The last step in the fill and vent procedure SO23-3-1.4 requires attachment 3 of the procedure, "RCS post-fill valve alignment," to be performed. In this case, the Control Room Supervisor [utility, licensed] responsible for implementation of this procedure attachment did not verify correct MU995 position as required. Because two different crews were involved with maneuvering the plant at the time MU995 misposition occurred (9/95), incomplete shift turnover may have contributed to the error in this case.

CORRECTIVE ACTIONS:

Edison confirmed by a review of plant records that the corresponding Unit 2 RCGVS reactor head vent valve MU995 was closed. Edison has implemented appropriate disciplinary action against the Control Room Supervisor responsible for this occurrence. Edison will review this occurrence with all operating crews and will emphasize the importance of shift turnover communications.

Edison is reviewing major alignment procedures to ensure suitable second-checking of alignment decisions is implemented. Additionally, Edison is developing a list of valves inside containment which will be checked prior to closing containment after an outage.

SAFETY SIGNIFICANCE

This occurrence is of particular concern to Edison management as the performance of plant operators in this case was significantly below Edison's expectations. Edison is performing a probablistic risk assessment of this issue. Preliminary results indicate the risk impact of this condition to have been an increase in core damage probability on the order of 5E-8.

Evaluation of UFSAR Requirements:

UFSAR Section 3.6 addresses the requirements for evaluating postulated effects from High Energy Line Breaks (HELBs). This UFSAR section indicates that HELBs do not need to be postulated in the reactor vessel head vent piping, since the upstream (3/4") and downstream (1") piping diameters are 1 inch or smaller, and is not dependent upon the flow restricting orifice. Additionally, the existing analyses of postulated HELBs did not identify any potential jet impingement or pipe whip interactions with this line. Therefore, with MU995 mispositioned, the unit continued to comply with the UFSAR HELB analysis.

The post-LOCA long term cooling analysis discussed in UFSAR Section 6.3.3.4 applies to break sizes below 1.9 inches flow diameter. Since the postulated rupture of the RCGVS line would be 0.612 inches in diameter, the long term cooling analysis as described in this section of the UFSAR continues to be bounding.

With MU995 open, it did not provide the flow restricting ability for the RCGVS reactor head vent line as discussed in UFSAR Section 9.3.7. However, the RCGVS design includes redundant isolation valves and control circuits, and motive power for the isolation valves is locked out during plant operation. These features alone satisfy the requirements of NUREG-0737 and are unaffected

by the position of MU995. Consequently, the results of the UFSAR Chapter 9.3.7 failure analysis remain unchanged.

The Fire Hazards Analysis (UFSAR Section 9.5.1) was not affected by this valve misposition. There were no potential spurious circuit interactions created. Further, spurious opening of the redundant isolation valves can not occur because the isolation valves have their motive power locked out during plant operation.

UFSAR Section 15.6 evaluates the effects of postulated small break Loss of Coolant Accidents (SBLOCA) on the RCS. As shown in UFSAR Table 15.6-19 and Figure 15.6-184, the existing SBLOCA analyses for San Onofre evaluates the consequences of a postulated break equivalent to a 1.35 inch diameter line. For the RCGVS, the most limiting rupture location would be at the vessel head (upstream of MU995). Because the RCGVS line has an inside diameter of 0.612 inches, the UFSAR SBLOCA analysis bounds a postulated rupture of the RCGVS line. The ABB topical reports for SBLOCA approved by the NRC (CEN-114-P, Amendment 1-P & CENPD 137-P) confirms that no core uncovery would occur for break sizes less than a flow diameter of 1.35 inches.

When MU995 is closed, the RCGVS flow diameter is 0.188 inches. Thus, the piping downstream of MU995 (to the first isolation valve) is normally pressurized during plant operation. With MU995 open, there was no increase in the pressure or temperature experienced by this line.

The probability of ruptures of the vent system piping were unaffected, since the downstream piping was (1) already pressurized, (2) is Seismically 1 piping, and (3) is identical to the upstream piping in material, stress analysis and fabrication (see ASME Code discussion below).

When MU995 is closed (with a flow diameter of 0.188 inches), if the downstream isolation valve(s) were opened, the resulting flow through this opening (at normal RCS temperature and pressure) would be about 30 gpm (less than the makeup capacity of one charging pump - about 44 gpm). When MU995 is opened, the inside diameter of the RCGVS line is about 0.612 inches and the resulting flow under the same conditions would be larger than the makeup capacity of three charging pumps. However, as noted by the UFSAR SBLOCA analysis, the resulting flow rate would be well within the makeup capacity of the high pressure safety injection system. Therefore, adequate makeup to the RCS was always available and remained within the bounds of the UFSAR SBLOCA analysis.

In summary, with MU995 open and the postulation of a rupture of the RCGVS line:

- The plant remained bounded by the HELB analyses,
- The plant remained bounded by the RCGVS Failure Modes and Effects Analysis,
- The plant remained bounded by the Updated Fire Hazards Analysis,
- The plant remained bounded by the UFSAR SBLOCA analyses.

Additionally, because the plant remained bounded by the UFSAR analyses detailed above, the potential dose consequences of a postulated rupture of the RCGVS line remain bounded by the UFSAR analyses as well.

Technical Specification Impact:

Licensee Controlled Specification (LCS) 3.4.102 and the previous technical specification (TS) 3.4.10 did not address the position of MU995 as a condition for RCGVS operability. However, conservatively considering the RCGVS inoperable with MU995 open, both the new LCS 3.4.102 and the old TS 3.4.10 for the RCS head vent system would allow continued full power operation provided that the two isolation valves down stream of MU995 are closed with power removed. Because this requirement is (and was) the normal position of these downstream valves, the requirements of the previous TS and new LCS were always satisfied during the period MU995 was mispositioned.

RCS and RCGVS - ASME Code Effects

During plant construction, it was standard Edison construction practice to identify a code change (from Class 1 to Class 2) when allowed by the ASME Code. All small bore instrument lines connected to the RCS were designed ASME III Class 1 upstream of a flow restrictor and a lesser code class downstream. Consequently, the RCGVS line from the reactor vessel head to MU995 is designed to meet the requirements of ASME III Class 1. The RCGVS line between MU995 and the first down stream isolation valves is ASME III Class 2. Edison reviewed the actual downstream ASME Code impact based on the 1989 Edition (the Code of the record is 1974 Edition) and construction specifications with the following results:

Allowable Stresses: The allowable stresses are the same since both portions of lines are analyzed in accordance of ASME III class 2 rules in accordance with the Code.

Material: The material used for both the Class 1 and the Class 2 portions of the RCGVS lines is the same.

Welding and Non Destructive Examination:

Both the Class 1 and Class 2 RCGVS lines were butt welded, and radiographed to the same acceptance standards. The Class 1 welds require an additional surface exam, while Class 2 welds do not require a surface exam. However, the radiographic exam performed for these welds is a full volumetric exam and is sufficient to detect any weld defects, including surface defects.

Results: ASME III Class 1 and Class 2 piping in the RCGVS lines are identical in material, stress analysis, and fabrication requirements.

Additional Information:

In the past three years, there have been no other reportable occurrences caused by an operator assuming a valve was in the correct position and failing to verify a valve position as required.