Southern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION

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March 17, 1992

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

Subject: Docket No. 50-361
Supplemental Report
Licensee Event Report No. 89-010, Revision 2
San Onofre Nuclear Generating Station, Units 2 and 3

Reference: Letter, H. E. Morgan (SCE) to USNRC Document Control Desk, dated March 16, 1990

The referenced letter provided Licensee Event Report (LER) No. 89-010, (Revision 1), for a condition involving the Units 2 and 3 Main Steam Safety Valve (MSSV) capacity. The enclosed supplemental LER provides additional corrected information concerning Unit 3 operation with a gagged MSSV. The previous revision had failed to address periods when Unit 3 had operated with one MSSV gagged. Since this occurrence involves similar systems, cause, and corrective actions applicable to Units 2 and 3, a single revised report for Unit 2 is being submitted in accordance with NUREG-1022. Neither the health nor the safety of plant personnel or the public was affected by this condition.

If you require any additional information, please so advise.

Sincerely,

R W Krieger

Enclosure: LER No. 89-010, Rev. 2

cc: C. W. Caldwell (USNRC Senior Resident Inspector, Units 1, 2 and 3)
J. B. Martin (Regional Administrator, USNRC Region V)
Institute of Nuclear Power Operations (INPO)

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LICENSEE EVENT REPORT (LER)

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

Title (4)
MAIN STEAM SAFETY VALVE (MSSV) FLOW CAPACITY APPARENTLY LESS THAN NAMEPLATE RATING

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)
									SONGS, UNIT 3	0 5 0 0 0 3 6 2
0 5	2 0	8 9	8 9	- 0 1 0	- 0 2	0 3	1 7	9 2		0 5 0 0 0

OPERATING MODE (9)	5
POWER LEVEL (10)	0 0 0

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

___ 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)	X 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)	___ 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)			

VOLUNTARY

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
R. W. Krieger, Station Manager	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	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
B	S B	V B	C 7 1 0	YES					

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)

This revision to voluntary LER 89-010 provides corrected information concerning Unit 3 operation with a gagged main steam safety valve (MSSV).

On 5/20/89, with Unit 2 in Mode 5 (cold shutdown) and Unit 3 at 100% power, during an ongoing evaluation of Information Notice (IN) 86-05, "Main Steam Safety Valve Test Failures and Ring Setting Adjustments," it was concluded that the MSSV flow capacities were most likely less than nameplate rating. This conclusion was based upon best available findings of the Westinghouse Owners Group (WOG) Subcommittee on MSSVs, and upon the factory-set ring settings of the Units 2 and 3 MSSVs.

Analyses performed indicated that overpressure protection with all MSSVs operable at the reduced capacity was adequate and would not alter the results of the safety analyses; these conclusions were supported by actual performance data taken following two actual loss of heat removal events (LER 86-022 [Docket No. 50-361] and LER 90-002 [Docket No. 50-362]). However, a review of operating history for Units 2 and 3 later identified that Unit 3 had operated at power from 8/27/86 to 9/30/86 with one MSSV gagged. During this time, Unit 3 reactor power did not exceed 94%. Unit 2 had not operated at power with a gagged MSSV. An additional analysis concluded that there was minimal safety significance associated with operations at reduced MSSV capacity and with one MSSV gagged.

As reported in IN 86-05, MSSVs with initial factory-set ring settings obtain a disc lift that is less than rated lift. The MSSV ring settings were initially set based upon valve operational tests conducted at limited volume test facilities on valves typically smaller than the MSSVs. Test facilities for full flow testing of MSSVs were not available at the time the valves were manufactured.

The ring settings for the Units 2 and 3 MSSVs were changed such that full flow capacity of the MSSVs was achieved.

Plant: San Onofre Nuclear Generating Station
Units: 2 and 3
Reactor Vendor: Combustion Engineering
Event Date: 05-20-89

A. CONDITIONS AT TIME OF THE EVENT:

Unit 2: Mode 5, Cold Shutdown
Unit 3: Mode 1, Power Operation

B. BACKGROUND INFORMATION:

The purpose of this revision is to provide corrected information in regard to plant operation with gagged main steam safety valves (MSSV).

1. Main Steam Safety Valves (MSSVs)

Nine (9) MSSVs [RV] are provided on each of two main steam (MS) lines (one line per steam generator [SG]) to protect the MS system [SB] from overpressurization. The MSSVs each have a nameplate rating of approximately 233 pounds mass per second at 103% of setpoint pressure (i.e., at 3% accumulation). This rating is dependent upon the valve obtaining rated lift. Rated lift of the valve is dependent, in part, upon the ring settings of the valve. The ring settings also determine, in part, the blowdown and accumulation characteristics of the valves.

2. Technical Specification (TS) Requirements

TS 3.7.1.1, "Turbine Cycle - Safety Valves," establishes the operability requirements of the MSSVs and the maximum allowable reactor protection system [JC] linear power level-high reactor trip (LPLHT) setpoint when one or more MSSVs are inoperable. The purpose of these TS requirements is to ensure that the secondary system pressure will be limited to within 110% of its design pressure during the most severe anticipated system operational transient.

3. Westinghouse Owners Group (WOG) Subcommittee on MSSVs:

Information Notice (IN) 86-05, "Main Steam Safety Valve Test Failures and Ring Setting Adjustments", and Supplement 1 were issued in 1986. This IN was provided to alert recipients of the potential for MSSVs to possess less than full-rated flow capacity due to initial factory-set ring settings. The WOG Subcommittee on MSSVs was formed to address the ring setting problem and to establish recommended MSSV generic ring settings such that full capacity of the MSSVs is achieved. These generic ring settings and their relationship with other MSSV design parameters have been established.

C. DESCRIPTION OF THE EVENT:

1. Event:

On 5/20/89, with Unit 2 in Mode 5 (cold shutdown) and Unit 3 at 100% power, during an ongoing evaluation of IN 86-05, it was concluded that the MSSV flow capacities were most likely less than nameplate rating. This conclusion was based upon best available findings of the WOG Subcommittee on MSSVs and upon the factory-set ring settings of the Units 2 and 3 MSSVs. The MSSV ring settings had not been subsequently changed by SCE.

An evaluation was performed to determine the capability of the Units 2 and 3 MSSVs to meet design requirements with factory-set ring settings. This analysis indicated that overpressure protection with all MSSVs operable was adequate. However, the power reduction required by the LPLHT setpoint with one MSSV removed from service specified by TS 3.7.1.1 did not provide sufficient margin to preclude exceeding the secondary design pressure limit of 110% if the plant were operated just below the LPLHT setpoint. In practice, a reduction in operating power level would have occurred to preserve a sufficient operating margin.

A review of operating history for Units 2 and 3 later identified that Unit 3 had operated at power from 8/27/86 to 9/30/86 with one MSSV gagged. During this time, the LPLHT was reduced to 98.6% as required by TS 3.7.1.1 for operation with one MSSV gagged. Reactor power did not exceed 94% between 8/27/86 and 9/30/86. Unit 2 had not operated at power with a gagged MSSV.

2. Inoperable Structures, Systems or Components that Contributed to the Event:

Not applicable.

3. Sequence of Events:

Not applicable.

4. Method of Discovery:

As discussed in section C.1, "Event", above.

5. Personnel Actions and Analysis of Actions:

Not applicable.

6. Safety System Responses:

Not applicable.

D. CAUSE OF THE EVENT:

As reported in IN 86-05, MSSVs with initial factory-set ring settings obtain a disc lift that is less than rated lift. The MSSV ring settings were initially set based upon valve operational tests conducted at limited volume test facilities on valves typically smaller than the MSSVs. Test facilities for full flow testing of MSSVs were not available at the time the valves were manufactured.

E. CORRECTIVE ACTIONS:

Corrective Actions Taken:

The ring settings for the Units 2 and 3 MSSVs were changed to be consistent with the new recommended generic settings during the Cycle 5 refueling outages, thus achieving full flow capacity of the MSSVs.

F. SAFETY SIGNIFICANCE OF THE EVENT:

Conservative evaluation techniques indicated that with all MSSVs available, the reduced MSSV capacities were sufficient to meet design bases and would not have altered the results of the safety analyses. The MSSV analytical model utilized to arrive at this conclusion estimated 75% of full nameplate flow. In addition, these conclusions were supported by actual performance data taken following two actual loss of heat removal events (LER 86-022 [Docket No. 50-361] and LER 90-002 [Docket No. 50-362]).

The loss of condenser vacuum (LOCV) event was re-analyzed using the RETRAN Transient Analysis Code (best estimate) from EPRI. The LOCV is the most limiting design bases event while operating with one gagged MSSV. The results of this analysis indicate that the calculated peak secondary pressure would have been less than the design basis value of 1210 psia at 94% power and 75% MSSV capacity. Therefore, there was minimal safety significance associated with operations at reduced MSSV capacity and with one Unit 3 MSSV gagged.

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

The MSSVs are manufactured by Crosby Valve and Gage Co. (Model No. 6R10 HA75FN).

2. Previous LERs for Similar Events:

None.

3. Results of NPRDS Search:

Not applicable. The WOG Subcommittee on MSSVs evaluated reduced MSSV capacities reported at other facilities and in IN 86-05.

4. Additional Information:

The MSSVs satisfy TS 3.7.1.1, which requires the MSSVs to be operable with specific relief setpoints. Also, they satisfy the basis for this TS by limiting steam pressure to 110% of design during certain severe transients. However, an evaluation revealed that the MSSVs' total flow rate stated in the TS Basis and in FSAR Appendix 5.2A, Over Pressure Protection, was a preliminary value used prior to manufacture rather than the flow needed to limit steam pressure. The UFSAR has been updated to reflect the appropriate design basis. A TS amendment application to revise the basis to TS 3.7.1.1 has been submitted by letter from SCE to the NRC dated November 8, 1990.