

NRC FORM 366
(MMM-YYYY)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

APPROVED BY OMB NO. 3150-0104 EXPIRES MM/DD/YYYY

Estimated burden per response to comply with this mandatory information collection request 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Information and Records Management Branch (T-6 F33) U.S. Nuclear Regulatory Commission, Washington, DC 20585-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20583. If a document used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, information collection.

FACILITY NAME (1)

San Onofre Nuclear Generating Station (SONGS) Unit 2

Docket Number (2)

05000-361

Page (3)

1 of 8

TITLE (4): Main Steam Safety Valve Setpoints Greater Than Allowed By Tech. Spec.

EVENT DATE			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MON	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	31	1998	1998	-- 0025 --	00	1	29	1999	FACILITY NAME	DOCKET NUMBER

MODE	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check One or More) (11)				
		20.2201(b)	20.2203(a)(2)(v)	X	50.73(a)(2)(i)	50.73(a)(2)(viii)
POWER LEVEL	087	20.2203(a)(1)	20.2203(a)(3)(i)		50.73(a)(2)(ii)	50.73(a)(2)(x)
L (10)		20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)	OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)	
		20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME				TELEPHONE NUMBER (Include Area			
R.W. Krieger, Vice President, Nuclear Generation				949-368-6255			

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
Yes (If yes, complete EXPECTED SUBMISSION DATE)	X	No				

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

Southern California Edison (SCE), while performing the lift setpoint testing, found 3 Main Steam Safety Valve (MSSV) above their "as found" lift setpoint allowed by the Technical Specification (TS). It is possible that at least one MSSV was above its TS allowable as-found setting longer than the allowed action time during Mode 1 through 3 operation. Therefore, SCE is reporting this occurrence in accordance with 10CFR50.73(a)(2)(i).

The cause of the high setpoint was determined to be setpoint drift for one of the valves. The other two valves were returned to their manufacturer for inspection and determination of the cause of the high lift setting.

SCE reviewed overhaul and test data, and confirmed the valves were set correctly when installed. All three valves were reset to within 1 percent of its lift setting. Two of the valves were replaced during the subsequent refueling outage.

This event had no safety significance.

In the past three years, SCE has not reported any similar events involving MSSVs.

9902050046 990129
PDR ADOCK 05000361
S PDR

LICENSEE EVENT REPORT (LER)

U.S. NUCLEAR REGULATORY COMMISSION

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	1998	-- 025 --	00	2 OF 8

Plant: San Onofre Nuclear Generating Station Units 2
 Reactor Vendor: Combustion Engineering
 Event Date: December 31, 1998
 Event Time: 1737 PST

Unit: 2
 Mode: 1, Power operation
 Power: 87.1 percent
 Temperature: 547 degrees F
 Pressure: 2250 psia

Background:

The primary purpose of the Main Steam Safety Valves (MSSVs) (SB, RV) is to provide overpressure protection for the secondary system. The MSSVs also provide protection against overpressurizing the reactor coolant pressure boundary by providing a heat sink for the removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser and Circulating Water System, is not available.

Nine MSSVs are located on each main steam header, outside containment, and upstream of the main steam isolation valves (MSIVs). The MSSVs' rated capacity passes the full steam flow at 102 percent rated thermal power (RTP) (100 percent + 2 percent for instrument error) with the valves full open.

The ASME requirement that MSSVs lift settings should be within 1 percent of the specified setpoint reflects two separate objectives:

1. The objective to maintain lift setpoints within the bounds of the safety analysis.
2. To minimize the number of valves which operate to mitigate an event by staggering the valve setpoints. This requirement reflects good engineering design, but not safety requirements. The objective of staggering setpoints constrains the less restrictive safety analysis requirement as a condition of operability.

In Mode 1, the accident analysis requires a minimum of five MSSVs per steam generator (SG) which is limiting and bounds all lower Modes. In Modes 2 and 3, both the ASME Code and the accident analysis require only one MSSV per SG to provide overpressure protection. In Modes 4 and 5, there are no credible transients requiring the MSSVs. The SGs are not normally used for heat removal in Modes 5 and 6, and thus cannot be overpressurized; there is no requirement for the MSSVs to be operable in Modes 5 and 6.

Technical Specification (TS) 3.7.1, Main Steam Safety Valves (MSSVs), requires the MSSVs to be operable as specified in Modes 1, 2, and 3. With one or more MSSVs inoperable, Action A requires power be reduced to less than the value shown in Table 1 within 4 hours, and the Linear Power Level High Trip setpoint be reduced in accordance with Table 1 within 12 hours.

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISI ON NUMBER	
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	1998	-- 025 -	00	3 OF 8

TS 3.7.1 requires each MSSV, except valves 2PSV-8401 and 2PSV-8410, have an as-found tolerance of +2 percent/-3 percent. 2PSV-8401 and 2PSV-8410 (the lowest setpoint valves) have an as-found lift setting tolerance of +1 percent/-3 percent. Following testing according to TS 5.5.2.10, each MSSVs is required to be set within +/-1 percent of the specified lift setpoint.

TS Surveillance Requirement (SR) 3.7.1.1 verifies the operability of the MSSVs by the verification of each MSSV lift setpoint within limits in accordance with the inservice testing program as specified in Table 2. The ASME Code, Section XI requires that safety and relief valve tests be performed in accordance with ANSI/ASME OM-1-1987. The following tests are required for MSSVs:

- a. Visual examination
- b. Seat tightness determination
- c. Setpoint pressure determination (lift setting)
- d. Compliance with owner's seat tightness criteria

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This is to allow testing of the MSSVs at hot conditions. The MSSVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSSVs are not tested at hot conditions, the lift setting pressure shall be corrected to ambient conditions of the valve at operating temperature and pressure.

Description of the Event:

On December 31, 1998 (the discovery date), Southern California Edison (SCE), while performing the lift setpoint testing required by TS SR 3.7.1.1, found MSSV 2PSV-8405 (SG 1) at 2.1 percent above its lift setting. Subsequent testing found 2PSV-8410 (SG 2) at 1.2 percent above its lift setpoint, and 2PSV-8415 (SG 2) at 4 percent above its lift setpoint.

It is possible that at least one MSSV was above its TS allowable as-found setting longer than the allowed action time (4 hours) during Mode 1 through 3 operation. Therefore, SCE is reporting this occurrence in accordance with 10CFR50.73(a)(2)(i).

Cause of the Condition:

The cause of the high setpoint for 2PSV-8410 was determined to be setpoint drift. The other two valves were returned to their manufacturer (Crosby) for inspection and determination of the cause of the high lift setting.

LICENSEE EVENT REPORT (LER)

U.S. NUCLEAR REGULATORY COMMISSION

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	1998	-- 025 -	00	4 OF 8

Corrective Action:

- SCE reviewed overhaul and test data, and confirmed the valves were set correctly when installed.
- 2PSV-8405 and 2PSV-8415 were reset to within 1 percent of their lift settings. The valves were replaced during the subsequent refueling outage. See the Additional Information section. The valves were sent to Crosby for examination.
- 2PSV-8410 was reset to within 1 percent of its lift setting.

Safety Significance:

All RCS and secondary side design basis accidents were examined to evaluate the impact of out-of-tolerance MSSVs. This condition had no actual safety significance because:

MSSV 2PSV-8405

2PSV-8405 is on a different SG line than the other two out-of-tolerance MSSVs (discussed below). The as-found setting for this valve was 1136.4 psig. The setpoint assumed in the safety analysis for 2PSV-8405 is 1135.9 psig (1150.6 psia). This minor 0.5 psi difference (0.044 percent of the safety analysis assumed value) has no safety significance because 2PSV-8405 is neither the first nor the last MSSV to be actuated and is overshadowed by the rate of change of pressure during an increasing pressure transient. In addition, the slightly later actuation would have been more than adequately offset by the lower as-found setting for previously actuated MSSVs on that steam line.

MSSV 2PSV-8410

Eight of the 9 MSSVs per steam generator (for a total of 16 out of 18) have an as-found TS acceptance tolerance limit of +2 percent/-3 percent. The lowest setpoint valve on each steam line (2PSV-8401 and 2PSV-8410) has a tolerance limit of +1 percent/-3 percent. Although not yet submitted to the NRC, the SBLOCA safety analysis has been reanalyzed to accommodate the larger +2 percent/-3 percent tolerance of the other MSSVs. Consequently, the safety analysis limit for all MSSVs in SONGS 2 and 3 is +2 percent/-3 percent for all design basis accidents.

The actuation setpoint assumed for 2PSV-8410 in the safety analysis is 1107.3 psig (1122 psia) compared to the as-found valve setting of 1098.8 psig. The as-found actuation setpoint for 2PSV-8410, while greater than the TS limit, was bounded by the results of the revised but not yet submitted analysis.

LICENSEE EVENT REPORT (LER)

U.S. NUCLEAR REGULATORY COMMISSION

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	1998	-- 025 --	00	5 OF 8

MSSV 2PSV-8415

The actuation setpoint assumed for 2PSV-8415 in the safety analysis is 1143 psig (1157.7 psia) compared to the as-found valve setting of 1165.1 psig. The limiting design basis event for which SG pressure could have reached this actuation setpoint is the Loss of Condenser Vacuum (LOCV) with single failure event (UFSAR Section 15.2.2.3 and 15.10.2.2.3). In the peak primary pressure case for this event, the peak pressure has occurred and turned around several seconds before the credited actuation of this valve in the safety analysis.

The worst case peak secondary pressure case in the LOCV with single failure event is the scenario where 4 MSSVs in each steam line are inoperable. For conservatism, the safety analysis assumes that the first 4 MSSVs in the sequence will be inoperable. Thereafter, all the remaining MSSVs actuate to mitigate peak secondary pressure. Table 3 shows the safety analysis assumed actuation sequence and the as-found actuation sequence for the MSSVs in the SG line affected by 2PSV-8415. The as-found tolerances result in a resequencing of the actuation of the MSSVs opening setpoints in this SG line. The detailed impact of this resequencing of the MSSVs as-found actuation sequence is shown in Table 3. The net impact on peak secondary pressure would be insignificant. Peak secondary pressure would continue to remain below the 1210 psia acceptance criteria for this event.

Additional Information:

- In the past three years, SCE has not reported any similar events involving MSSVs. LER 97-003 reported that two pressurizer safety valves were found with setpoints higher than allowed by TS. The cause is believed to be setpoint drift.
- All SONGS MSSVs have been converted (completed during this Unit 2 Cycle 10 refueling outage) to the new Crosby Flexi-disc design. The Flexi-disc design reduces seat leakage which can cause corrosion and setpoint drift.

LICENSEE EVENT REPORT (LER)

U.S. NUCLEAR REGULATORY COMMISSION

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISI ON NUMBER	
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	1998	-- 025 -	00	6 OF 8

Table 1 - Maximum Allowable Linear Power Level-High Trip Setpoints
versus Operable MSSVs

Minimum Number of MSSVs per Steam Generator Required Operable	Maximum Allowable Linear Power Level High Trip (Percent RTP)
8	98.6
7	86.3
6	74.0
5	61.6
4	Mode 3
3	Mode 3
2	Mode 3

LICENSEE EVENT REPORT (LER)

U.S. NUCLEAR REGULATORY COMMISSION

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISI ON NUMBER	
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	1998	-- 025 -	00	7 OF 8

Table 2 - Main Steam Safety Valves Lift Settings

Steam Generator 1 Valve No.	Steam Generator 2 Valve No.	Lift Setting (psig) (1)
2PSV-8401	2PSV-8410 (4)	1085 (2)
2PSV-8402	2PSV-8411	1092
2PSV-8403	2PSV-8412	1099
2PSV-8404	2PSV-8413	1106
2PSV-8405 (3)	2PSV-8414	1113
2PSV-8406	2PSV-8415 (5)	1120
2PSV-8407	2PSV-8416	1127
2PSV-8408	2PSV-8417	1134
2PSV-8409	2PSV-8418	1140

1. The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure. Each MSSV has an as-found tolerance of +2 percent/-3 percent. Following testing according to LCO 5.5.2.10, MSSVs will be set within +/-1 percent of the specified lift setpoint.
2. Valves 2PSV-8401 and 2PSV-8410 have an as-found lift setting of 1085 psig with a tolerance of +1 percent/-3 percent.
3. As-found lift setpoint was +2.1 percent of 1113 psig or 1136.4 psig.
4. As-found lift setpoint was +1.2 percent of 1085 psig or 1098.8 psig
5. As-found lift setpoint was +4 percent of 1120 psig or 1165.1 psig

FACILITY NAME (1)		DOCKET	LER NUMBER (6)			PAGE (3)
			YEAR	SEQUENTIAL NUMBER	REVISI ON NUMBER	
San Onofre Nuclear Generating Station (SONGS) Unit 2		05000-361	1998	-- 025 -	00	8 OF 8

Table 3: Impact of MSSV 2PSV-8415 As-found Tolerance on LOCV with Single Failure Event Peak Secondary Pressure Criteria

MSSV Actuation Sequence Order	Safety Analysis MSSV Actuation Setpoints psia	As-found MSSV Actuation Setpoint*		Impact
		psig	psia	
1	1122	1090.3	1105	No impact since limiting analysis case assumes this valve is inoperable
2	1129.1	1098.8	1113.5	No impact since limiting analysis case assumes this valve is inoperable
3	1136.3	1105.4	1120.1	No impact since limiting analysis case assumes this valve is inoperable
4	1143.4	1117.7	1132.4	No impact since limiting analysis case assumes this valve is inoperable
5	1150.6	1120.1	1134.8	First opening MSSV in safety analysis; Lower as-found actuation pressure (by 15.8 psi) will result in earlier secondary pressure relief and lower net impact on peak pressure.
6	1157.7	1134.1	1148.8	Lower as-found actuation pressure (by 8.9 psi) will result in earlier secondary pressure relief but favorable impact on peak pressure is minimal.
7	1164.8	1145.2	1159.9	Lower as-found actuation pressure (by 4.9 psi) will result in earlier secondary pressure relief but favorable impact on peak pressure is inconsequential.
8	1172	1146.0	1160.7	Lower as-found actuation pressure (by 10.3 psi) will result in earlier secondary pressure relief but favorable impact on peak pressure is inconsequential.
9	1178.1	1165.1	1179.8	Higher as-found tolerance (by 1.7 psi) will result in slightly later secondary pressure relief and by itself adversely impact secondary pressure
Overall Assessment				Slightly later opening of last MSSV in the as-found sequence relative to the safety analysis case will be offset by earlier opening of the first valve and slightly favorable opening of subsequent valves in the actuation sequence. The net impact on secondary pressure is insignificant.

* Impacted Steam Generator only