LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Palo Verde Unit 3	0 5 0 0 0 5 3 0	1 OF 0 6

TITLE (4)

Main Steam Safety Valve As-Found Lift Pressures Outside of Technical Specification Limits

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 NUMBERS
									Unit 1	0 5 0 0 0 5 2 8
0 9	0 2	9 8	9 8	- 0 0 3	- 0 0	1 0	0 2	9 8	Unit 2	0 5 0 0 0 5 2 9

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL(10)	1 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)	X 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		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	TELEPHONE NUMBER
Daniel G. Marks, Section Leader, Regulatory Affairs	AREA CODE 6 0 2 3 9 3 - 6 4 9 2

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
X	S B	R V	D 2 4 3	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 1	0 2	9 9

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

On September 2, 1998, Palo Verde Unit 3 was in Mode 1 (POWER OPERATION) operating at approximately 95 percent power and Units 1 and 2 were at 100 percent power when testing identified the first of seven Main Steam Safety Valves (MSSVs) with as-found lift pressures outside of the Technical Specification (TS) limits. Control Room personnel declared MSSV SGE-PSV-573 inoperable until the valve could be adjusted and satisfactorily passed testing requirements. Similarly, MSSVs SGE-PSV-691, SGE-PSV-576, SGE-PSV-560, SGE-PSV-555, SGE-PSV-557 and SGE-PSV-695 were found to have lift pressures out side of TS limits and each were satisfactorily re-tested and declared operable.

This event is under investigation and the cause of the condition is not known at this time. However, because several of the Unit 3 MSSVs were previously replaced from warehouse stock, the condition was determine to be potentially transportable and Unit 1 and 2 MSSVs which had been replaced during the last outages were also tested. Unit 1 MSSV SGE-PSV-695 and Unit 2 MSSV SGE-PSV-556 were found to have as-found lift pressures outside TS limits and each was satisfactorily re-tested and declared operable.

Previous similar events have been reported in LERs 528/98-004, 529/97-001, and 530/97-003.

TEXT

1. REPORTING REQUIREMENT:

This LER is being submitted to report an event where a single cause or condition may have caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system designed to: (A) Shut down the reactor and maintain it in a safe shutdown condition; (B) Remove residual heat; (C) Control the release of radioactive material; or (D) Mitigate the consequences of an accident, as specified in 10 CFR 50.73(a)(2)(vii).

In addition, this LER is being submitted to report an operation or condition prohibited by the plant's Technical Specifications (TS) as specified by 10 CFR 50.73 (a)(2)(i)(B). Because of the number of Main Steam Safety Valves (MSSV) (RV) (SB) found out-of-tolerance, APS has reason to believe the MSSVs became inoperable sometime prior to the time of discovery. As such, the TS Limiting Condition for Operation (LCO) 3.7.1 may not have been met during the past operating cycle.

2. EVENT DESCRIPTION:

On September 1, 1998, Palo Verde Unit 3 was in Mode 1 (POWER OPERATION) operating at approximately 95 percent power when APS Maintenance, APS Engineering and Furmanite personnel began on-line testing of the Unit 3 MSSVs using the Furmanite Digital Trevitest method. MSSVs are required to be tested once per five years by TS Surveillance Requirement (SR) 3.7.1.1 and the ASME Code requirements, however, Palo Verde has committed to test the valves prior to each refueling outage in accordance with previously specified corrective actions. The MSSVs are tested in accordance with approved procedures under normal operating pressure and temperature conditions.

At approximately 0829 MST on September 2, 1998, Control Room personnel declared Steam Generator (AB) No. 1's (SG-1) MSSV SGE-PSV-573 inoperable because the as-found lift pressure was 7.0 percent greater than the 1290 pounds per square inch gauge (psig) lift setting and entered TS 3.7.1 CONDITION A. The TS allowable tolerance for SGE-PSV-573 is +/- 3.0 percent of the 1290 psig design lift pressure. SGE-PSV-573 was satisfactorily re-tested without any setpoint adjustments and declared operable at approximately 0859 MST on September 2, 1998. TS 3.7.1. CONDITION A was exited and MSSV testing continued.

TEXT

At approximately 1012 MST on September 2, 1998, Control Room personnel declared SG-1's MSSV SGE-PSV-691 inoperable and entered TS 3.7.1 CONDITION A, because the valve did not lift when subjected to an upward force equivalent to 5 percent of the rated lift setting. SGE-PSV-691 was adjusted and subsequently lifted at 1.7 percent of design lift pressure (1315 psig). During subsequent lift tests the valve lifted at 1308 and 1311 and the as-left setting was 1313 psig or -0.2 percent of the design lift pressure. After successful testing, SGE-PSV-691 was declared operable at approximately 1118 MST on September 2, 1998 and TS 3.7.1 CONDITION A was exited.

At approximately 1332 MST on September 2, 1998, Control Room personnel declared SG-1's MSSV SGE-PSV-576 inoperable and entered TS 3.7.1 CONDITION A, because the valve did not lift during the first and second attempt when subjected to an upward force equivalent to 5 percent of the rated lift setting. During the third attempt, SGE-PSV-576 lifted at 1.2 percent of design lift pressure (1315 psig). During subsequent lift tests the valve lifted at 1308, 1311 and 1313 psig, or -0.2 percent of the design lift pressure, which was the as-left lift pressure. SGE-PSV-691 was declared operable at approximately 1409 MST on September 2, 1998 and TS 3.7.1 CONDITION A was exited.

At approximately 1517 MST on September 3, 1998, Control Room personnel declared SG-2's MSSV SGE-PSV-560 inoperable and entered TS 3.7.1 CONDITION A, because the as-found lift pressure was 6.9 percent of the design lift pressure of 1290 psig and greater than the +/- 3.0 percent allowed by TS. Adjustments were made to the valve and during subsequent testing the valve lifted at 1288, 1286 and 1285 psig, which was the as-left lift pressure. SGE-PSV-560 was declared operable at approximately 1549 MST on September 2, 1998 and TS 3.7.1 CONDITION A was exited.

At approximately 1735 MST on September 3, 1998, Control Room personnel declared SG-2's MSSV SGE-PSV-555 inoperable and entered TS 3.7.1 CONDITION A, because the valve did not lift when subjected to an upward force equivalent to 7 percent of the rated lift setting. SGE-PSV-555 was adjusted and subsequently lifted at 1327, 1295 and the as-left setting was 1300 psig or 0.8 percent of the design lift pressure of 1290 psig. SGE-PSV-691 was declared operable at approximately 1802 MST on September 3, 1998 and TS 3.7.1 CONDITION A was exited.

TEXT

At approximately 0927 MST on September 4, 1998, Control Room personnel declared SG-2's MSSV SGE-PSV-557 inoperable and entered TS 3.7.1 CONDITION A, because the valve lifted at 1379 psig or 4.9 percent of the design lift pressure of 1315 psig. During subsequent lift tests the valve lifted at 1291, 1285 and the as-left setting was 1300 psig or -1.1 percent of the design lift pressure. After successful testing, SGE-PSV-557 was declared operable at approximately 0959 MST on September 4, 1998 and TS 3.7.1 CONDITION A was exited.

At approximately 1020 MST on September 4, 1998, Control Room personnel declared SG-2's MSSV SGE-PSV-695 inoperable and entered TS 3.7.1 CONDITION A, because the valve lifted at 1364 psig or 3.7 percent of the design lift pressure of 1315 psig. The valve was adjusted and during subsequent lift tests the valve lifted at 1280, 1314 and the as-left setting was 1311 psig or -0.3 percent of the design lift pressure. After successful testing, SGE-PSV-695 was declared operable at approximately 1129 MST on September 4, 1998 and TS 3.7.1 CONDITION A was exited.

A review of the history of the failed Unit 3 MSSVs revealed that each of the seven had been replaced during the last Unit 3 refueling outage. Also, four of the seven valves which had been replaced had been taken from warehouse stock. Based upon the potential that a transportable condition might exist, a decision was made to re-test six Unit 1 and two Unit 2 MSSVs that had been replaced during their most recent outages.

At approximately 1806 MST on September 5, 1998, Unit 2 Control Room personnel declared SG-2's MSSV SGE-PSV-556 inoperable and entered TS 3.7.1 CONDITION A, because the valve lifted at 1361 psig or 3.5 percent of the design lift pressure 1315. The valve was adjusted and during subsequent tests the valve lifted at 1321, 1326 and the as-left setting was 1317 psig or 0.2 percent of the design lift pressure. After successful testing, SGE-PSV-556 was declared operable at approximately 2058 MST on September 5, 1998 and TS 3.7.1 CONDITION A was exited.

At approximately 1611 MST on September 9, 1998, Unit 1 Control Room personnel declared SG-2's MSSV SGE-PSV-695 inoperable and entered TS 3.7.1 CONDITION A, because the valve lifted at 1371 psig or 4.3 percent of the design lift pressure of 1315 psig. The valve was adjusted and during subsequent tests the valve lifted at 1306, 1307 and the as-left setting was 1309 psig or -0.5 percent of the design lift pressure. After successful testing, SGE-PSV-695 was declared operable at approximately 1739 MST on September 5, 1998 and TS 3.7.1 CONDITION A was exited.

An investigation was initiated in accordance with the APS corrective action program to evaluate the cause of the MSSVs high out-of-tolerance lift pressures. During the event, there were no safety system actuations and none were required.

3. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THIS EVENT:

An assessment of the safety consequences is being performed as part of the ongoing investigation of this event. Preliminary analysis indicates that the system was capable of performing its intended safety function with the out-of-tolerance MSSVs. At this time, Pressurizer Safety Valve (PSVs)(AB)(RV) testing results are not available, so Technical Specification limits for PSV settings were used in lieu of the actual as-found PSV values in the preliminary analysis. The preliminary analysis demonstrated that the condition would not have resulted in the primary and secondary system peak pressures exceeding the acceptance criteria. A final assessment of safety consequences will be included in the supplement to this LER, which is expected to be submitted by January 02, 1999.

The MSSV as-found out-of-tolerance conditions did not result in any challenges to the fission product barriers or result in any release of radioactive materials. There were no adverse safety consequences or implications as a result of this event. This event did not adversely affect the safe operation of the plant or health and safety of the public.

4. CAUSE OF THE EVENT:

An investigation of this event is being conducted in accordance with the APS Corrective Action Program. While the cause of the condition is not yet known, out-of-tolerance lift pressures and repeatability problems during pre-refueling outage testing is well documented in the industry. Preliminary findings suggest that factors such as; intermolecular bonding, valve storage conditions, water chemistry, flatness of the disc relative to the nozzle seating surfaces, and the valve internal component tolerances contribute to the valve discs "sticking" to their nozzle seats.

No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event. No personnel or procedural errors contributed to this event.

5. STRUCTURES, SYSTEMS, OR COMPONENTS INFORMATION:

The MSSVs were manufactured by Dresser/Consolidated and are Consolidated 3700 series valves designed for nuclear service and certified under Section III, class 2, of the ASME Code for application in nuclear power systems. Palo Verde's specific valves are Maxiflow, spring-loaded, direct acting, model No. 3707-R with 6" 1500 pound inlet and a 10" 300 pound outlet.

There are no indications that any structures, systems, or components were inoperable at the start of the event that contributed to this event. No failures that rendered a train of a safety system inoperable were involved. No failures of components with multiple functions were involved.

6. CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

Unit 3 MSSVs which had as-found lift pressures outside of the TS limit (SGE-PSV-555, SGE-PSV-557, SGE-PSV-560, SGE-PSV-573, SGE-PSV-576, SGE-PSV-691 and SGE-PSV-695) were either adjusted and retested or simply retested and successfully completed testing and were returned to service. Each Unit 3 MSSV which had as-found lift pressures outside of the TS limit will be replaced with a refurbished and re-certified MSSV prior to completion of the current (seventh) refueling outage.

Unit 1 MSSV SGE-PSV-695 and Unit 2 MSSV SGE-PSV-556 were adjusted to within +/- 1 percent of TS limits and returned to service. These two MSSVs will be replaced with refurbished and re-certified MSSVs during their (respective) next refueling outages.

APS is investigating this event in accordance with the Corrective Action Program. Additional corrective actions may be developed based upon the findings of the investigation. APS will provide details of any additional corrective actions taken in the supplement to this LER which is expected to be submitted by January 02,1999.

7. PREVIOUS SIMILAR EVENTS:

Previous similar events have been reported in LERs 528/98-004, 529/97-001 and 530/97-003. Until the results of the current event investigation are available, an assessment of the effectiveness of previous corrective actions can not be made. An assessment of the effectiveness of previous corrective actions will be included in the supplement to this LER which is expected to be submitted by January 02, 1999.