

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Palo Verde Unit 3		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT

1. REPORTING REQUIREMENT:

This LER (50-530/97-003-00) 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).

Specifically, from February 11 through February 15, 1997, testing identified seven main steam safety valves (MSSVs) (RV) (SB) with as-found lift settings outside of the TS (+/-3%) limit.

During an NRC Engineering Team Inspection (May 19, 1997, through June 6, 1997) an NRC inspector questioned why the MSSV out-of-tolerance condition had not been reported in accordance with 10 CFR 50.73. APS subsequently performed a reportability review June 5, 1997, and determined the MSSV out-of-tolerance condition should be reported in accordance with 10 CFR 50.73. This LER is being submitted on the premise that a common mode failure may have caused the out-of-tolerance condition and a TS violation may have occurred.

2. EVENT DESCRIPTION:

On February 11, 1997, Palo Verde Unit 3 was in Mode 1 (POWER OPERATION) operating at approximately 86 percent power when APS Maintenance, APS Engineering (other utility personnel) and Furmanite (contractor personnel) began on-line testing of the Unit 3 MSSVs using the Furmanite Digital Trevitest method. By February 15, 1997, trevittest activities were completed and a total of seven MSSVs had been identified with as-found lift set pressures greater than the 3 percent allowed by TS 3.7.1.1. Six of the seven valves were adjusted and/or retested in accordance with APS procedures and returned to an operable status by February 15, 1997.

Following the initial as-found testing, six of the seven valves were retested in accordance with APS procedures. APS procedures require the acceptable completion of three consecutive lift tests within +/-3% of the valve's nameplate set pressure, prior to declaring the valve operable.

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Industry experience has demonstrated that safety valves typically have higher lift setpoints during the initial lift test. Following the initial (as-found) testing, all six valves acceptably completed three consecutive lift tests without making setpoint adjustments. Three of the six MSSVs subsequent lift tests were within 1% of the nameplate set pressure and the remaining three were within 3% of the nameplate set pressure.

As-Found Set Pressure	Second Test Actuation	Third Test Actuation	Fourth Test Actuation
+3.04%	+1.60%	+1.50%	+1.20%
+3.20%	+0.77%	+0.69%	+0.38%
+3.20%	+2.01%	+0.77%	+1.08%
+3.70%	+1.74%	+1.14%	+0.91%
+4.40%	+0.76%	+0.07%	+0.30%
+5.00%	-0.62%	-0.23%	-0.46%

The lift setpoint of one of the six valves was adjusted to within +/-1% of nameplate set pressure and this valve was left in service. The other five MSSVs along with SGE-PSV-691 were replaced during the refueling outage.

During trevittest activities performed on February 11, 1997, MSSV SGE-PSV-691 did not lift when subjected to an upward force equivalent to 5.8 percent of the rated lift setting and testing was suspended. MSSV SGE-PSV-691 was quarantined and was mechanically gagged. Unit 3 continued to operate with MSSV SGE-PSV-691 inoperable, in accordance with TS LCO requirements, until February 22, 1997, when the sixth refueling outage began.

There were no safety system actuations as a result of this event and none were required.

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

A safety analysis was performed based upon the as-found MSSV data which demonstrated that the MSSVs would have performed their intended safety function. The analysis concluded that the condition would not have resulted in the secondary system peak pressure exceeding 110 percent of the design pressure limit.

The MSSV as-found out-of-tolerance condition 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.

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4. CAUSE OF THE EVENT:

An independent investigation of this event has been conducted in accordance with the APS corrective action program. Seven MSSVs had as-found lift set pressures greater than the $\pm 3\%$ allowed by TS. (SALP Cause Code: E Component Failure). Six of the seven MSSVs were adjusted and/or retested in accordance with APS procedures and were returned to an operable status during trevite test activities. Following the initial as-found test, three acceptable lift tests (within $\pm 3\%$ of nameplate set pressure) were obtained for each of these six valves. This data demonstrates that as-found tests for these valves were higher than subsequent lift tests.

MSSV SGE-PSV-691 was shipped to Wyle Laboratories for examination. An equipment root cause of failure analysis was performed and it was noted that the valve's spindle was out of alignment (total indicated runout). Galling was also observed on the disc holder, but was minor in nature and may have been present during previous valve rework. However, neither of these conditions should have prevented the valve from lifting, and the root cause analysis did not conclusively determine the cause of the condition.

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:

There are no indications that any structures, systems, or components were inoperable at the start of the event which contributed to this event.

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, model# 3707-RA-RT25 with 6" 1500 pound inlet and a 10" 300 pound outlet.

No component or system failures were involved. No failures that rendered a train of a safety system inoperable were involved. No failures of components with multiple functions were involved.

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6. CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

During the Unit 3 refueling outage (February 22, 1997 through March 31, 1997) six MSSVs were replaced with pre-certified spare valves from warehouse inventory. All replacement MSSVs were tested and accepted in accordance with APS procedures.

Actions to prevent recurrence will include the rebuilding and recertifying of the six removed valves prior to their return to service. As part of the engineering performance program, APS is continuing to trend and monitor MSSV performance and will continue to test the valves on an 18 month (refueling outage) basis.

7. PREVIOUS SIMILAR EVENTS:

LER 50-530/94-002-01 reported a similar MSSV out-of-tolerance condition. Previous corrective actions have been effective by greatly reducing the number of out of tolerance conditions. Since LER 50-530/94-002-01 was submitted (August 8, 1994) up until this LER, testing of the MSSVs has been completed in five separate refueling outages with only three valves failing to meet the TS tolerance.

