



Palo Verde Nuclear
Generating Station

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10CFR50.73

192-01089-WEI/DGM/DJS
May 24, 2001

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
License No. NPF-51
Licensee Event Report 2001-001-00**

Attached please find voluntary Licensee Event Report (LER) 50-529/2001-001-00, which has been prepared and submitted pursuant to 10 CFR 50.73. This voluntary LER reports the findings and corrective actions taken as a result of a single Unit 2 out of tolerance main steam safety valve (MSSV) condition which was discovered during augmented testing initiated under a previous PVNGS MSSV corrective action program.

No commitments are made to the NRC in this letter.

In accordance with 10CFR50.4, a copy of this LER is being forwarded to the Regional Administrator, NRC Region IV and the Resident Inspector. If you have questions regarding this submittal, please contact Daniel G. Marks, Section Leader, Regulatory Affairs, at (623) 393-6492.

Sincerely,

WEI/DGM/DJS/kg

Attachment

cc: E. W. Merschoff (all with attachment)
J. H. Moorman
L. R. Wharton

IE22

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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, the information collection.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1) Palo Verde Nuclear Generating Station Unit 2	DOCKET NUMBER (2) 05000529	PAGE (3) 1 OF 5
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TITLE (4)
Main steam safety valve as-found lift pressure outside of technical specification limits

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	19	2001	2001	001	00	05	24	2001	N/A	
									N/A	

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)							
		20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)	
POWER LEVEL (10)	100	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)	
		20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)	
		20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)	
		20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)	X		OTHER-Voluntary Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)			
		20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)			
		20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)			
		20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)			
20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)					

LICENSEE CONTACT FOR THIS LER (12)

NAME Daniel G. Marks, Section Leader, Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) 623-393-6492
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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 15 single-spaced typewritten lines) (16)

On March 19, 2001, Unit 2 was in MODE 1, operating at approximately 100 percent power when augmented testing revealed that a single main steam safety valve (MSSV) had an as-found lift pressure above the Technical Specification limit of +/- 3 percent of design lift pressure. The single MSSV is believed to have experienced a sticking phenomenon resulting from the valve disc bonding with the nozzle seat.

The valve was reset per plant procedures to +/-1% of the required setpoint.

Previous similar events have been reported in LERs 50-529/2000-009, 50-529/1999-002, 50-530/1998-003, 50-528/1998-004, 50-529/1997-001, and 50-530/1997-003.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

1. REPORTING REQUIREMENT (S):

This voluntary LER 529/2001-001-00 is being submitted to report a condition related to equipment performance that does not meet the reporting threshold of 10CFR50.73 (a) for submitting a LER, but may prove useful and be of generic interest to the nuclear industry.

During augmented testing of a Unit 2 main steam safety valve (MSSV) (EIIS: RV, SB) on March 19, 2001, the as-found lift pressure for one Unit 2 MSSV was found to be above the Technical Specification limit.

2. DESCRIPTION OF STRUCTURE(S), SYSTEM(S) OR COMPONENT(S):

The MSSVs are Dresser/Consolidated 3700 series valves designed for nuclear service and certified under Section III, class 2, of the ASME Code. Palo Verde's specific valves are Maxiflow, spring-loaded, direct acting, model No. 3707-R with 6 inch 1500 pound inlet and a 10 inch 300 pound outlet. Five MSSVs are located on each of the four main steam lines, outside containment (EIIS: NH), upstream of the main steam isolation valves (EIIS: ISV, SB). The total relieving capacity of the MSSVs is divided equally between the main steam lines each of which is sufficient to pass the steam flow equivalent to 105 percent of the plant's maximum steam flow. The MSSV design includes staggered setpoints so that only the number of valves needed for pressure reduction will actuate. The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. The MSSVs also provide protection against overpressurizing the reactor coolant pressure boundary (EIIS: AB) by providing a heat sink for the removal of energy from the reactor coolant system (EIIS: AB) if the preferred heat sink, provided by the condenser (EIIS: SG) and circulating water system (EIIS: KI, KE) is not available.

MSSVs are required to be tested once per five years by Technical Specification (TS) Surveillance Requirement (SR) 3.7.1.1 and the ASME Code requirements. However, Palo Verde tests the valves prior to each refueling outage in accordance with previously specified corrective actions. When MSSV testing is performed, approved procedures are used and the valves are tested under normal operating pressure and temperature conditions.

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3. INITIAL PLANT CONDITIONS:

On March 19, 2001, Unit 2 was in MODE 1 at approximately 100 percent power. Other than the condition reported herein, there were no structures, systems or components that were inoperable at the start of the event that contributed to the event.

4. EVENT DESCRIPTION:

On March 19, 2001, at approximately 1638 Mountain Standard Time (MST) set pressure verification testing of MSSV PSV0576 was commenced using the Furmanite Digital Trevitest method. Engineering personnel (utility, non-licensed) were conducting augmented testing to determine if a recently replaced MSSV exhibited signs of sticking. The as-found setpoint for MSSV PSV0576 was 1364 pounds per square inch gauge (psig) or +3.7% of the 1315 psig setpoint.

At 1656 MST, Operations personnel declared MSSV PSV0576 inoperable and entered TS Limiting Condition for Operation (LCO) 3.7.1 condition A. Adjustments to the valve lift pressure were made per plant procedures, to bring the lift pressure setpoint within +/-1% of the design set pressure and at 1745 MST, Operations declared the valve operable and exited LCO 3.7.1 condition A.

5. SAFETY CONSEQUENCES:

An evaluation of the safety consequences of the Unit 2 as-found MSSV testing results is being conducted in accordance with PVNGS procedures. This evaluation will address the effect of the single inoperable Unit 2 MSSV.

The evaluation of safety consequences will be used to determine if further analysis is required to assess if the primary or secondary design peak pressures would have been exceeded under accident conditions. Based on past as-found, out-of-tolerance setpoints, APS anticipates the evaluation will produce acceptable results and expects the safety function of the MSSVs would have been met.

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If, however, the final safety consequence analysis demonstrates that primary or secondary peak pressures would have been exceeded during accident conditions or other accident conditions would have been unacceptable as a result of this condition, APS will provide the results of the analysis in a supplement to this LER.

The augmented MSSV surveillance testing was being conducted in accordance with an approved station procedure. This approved surveillance test verifies lift setpoints in accordance with the Inservice Testing Program.

Based on previous experience, APS anticipates the condition would not have prevented the fulfillment of the safety function and did not result in a safety system functional failure as defined by 10CFR50.73(a)(2)(v).

6. CAUSE OF THE EVENT:

The out of tolerance as-found condition appears to be the result of the valve disc bonding with the nozzle seat.

There are two principal failure modes where the MSSV as-found test results exceed setpoint by greater than the allowed 3%. The first failure mode is characterized as a "sticking" phenomenon that has been attributed to the valve disc bonding with the nozzle seat. This phenomenon predominantly affects valves that have been in service less than one operating cycle. The sticking phenomenon is believed to have been the failure mode when as-found setpoints are 2% or more higher than the lift settings from subsequent lift tests. In most cases, the second lift point is within the acceptable +/- 3% of set point allowed by TS.

Based upon the findings from augmented testing and industry operating experience, APS engineering has reasonable assurance that performing a number of lifts at normal operating pressure and temperature reduces the likelihood that subsequent disc bonding will occur. It is believed the additional lifts allow the valve disc and nozzle surfaces to oxidize and reduces incidents of disc bonding.

The second failure mode is characterized as "drifting" and is defined as a changing lift setpoint between successive lifts (as left to as-found, or 2nd to 3rd) with no physical changes being made by the testing personnel.

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Since "sticking" occurs only one time during the testing sequence (typically between the first and second lift) and "drifting" typically occurs between any of the lifts, the failure modes can sometimes be differentiated. Based on previous experience and similar events at PVNGS, the high as-found reading is most likely due to sticking.

The out of tolerance setpoint (greater than +/- 3%) was determined to be a Maintenance Rule Functional Failure (MRFF).

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

7. CORRECTIVE ACTIONS:

Unit 2 MSSV PSV0576 discovered to have high as-found lift pressures outside of the technical specification limit during the augmented surveillance testing was adjusted and re-tested in accordance with procedure and returned to service.

8. PREVIOUS SIMILAR EVENTS:

Previous similar events have been reported in LERs 50-529/2000-009, 50-529/1999-002, 50-530/1998-003; 50-528/1998-004; 50-529/1997-001 and 50-530/1997-003. Previous corrective actions taken to reduce out of tolerance conditions have improved as-found test results, however, as-found out of tolerance conditions continue to occur. Previous corrective actions included a wider setpoint tolerance, control of unit chemistry to reduce iron transport, increased frequency for testing valves that exhibit sticking conditions, and an increase in testing frequency for all MSSVs from five years to 18 months.