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FACIL:STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi 05000530
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SUBJECT: LER 91-001-01:on 910315,safety valves discovered out of tolerance limits specified in Tech Spec.Caused by setpoint drift.Two PSVs out of tolerance upon initial testing & required adjustment.W/910609 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:Standardized plant. 05000530

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RIDS/ADDS

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JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00724-JML/TRB/RKR
June 9, 1991

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Mail Station P1-37
Washington, D.C. 20555

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 3
Docket No. STN 50-530 (License No. NPF-74)
Licensee Event Report 91-001-01
File: 91-020-404

Attached please find Supplement 1 to Licensee Event Report (LER) No. 91-001 prepared and submitted pursuant to 10CFR50.73. In accordance with 10CFR50.73(d), we are forwarding a copy of the LER to the Regional Administrator of the Region V office.

If you have any questions, please contact T. R. Bradish, Compliance Manager at (602) 393-2521.

Very truly yours,

James M. Levine

JML/TRB/RKR/nk

Attachment

cc: W. F. Conway (all with attachment)
J. B. Martin
D. H. Coe
A. C. Gehr
A. H. Gutterman
INPO Records Center

IE22
1/1

FACSIMILE

LICENSEE EVENT REPORT (LER)

FACILITY NAME	DOCKET NUMBER	PAGE
Palo Verde Unit 3	0 5 0 0 0 5 3 0	1 OF 0 8

TITLE: Safety Valve Setpoints Out of Tolerance

EVENT DATE			LER NUMBER			REPORT DATE			OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
									N/A	0 5 0 0 0
0 3	1 5	9 1	9 1	0 0 1	0 1	0 6	0 9	9 1	N/A	0 5 0 0 0

OPERATING MODE	1
POWER LEVEL	7 0

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

	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)		OTHER (Specify in Abstract below and in Text)
	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

NAME	TELEPHONE NUMBER
	AREA CODE
Thomas R. Bradish, Compliance Manager	6 0 2 — 3 9 3 — 2 5 2 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED		EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On March 15, 1991 while Unit 3 was in Mode 1 (POWER OPERATION) at approximately 70 percent power, an engineering evaluation of ASME surveillance testing results determined that ten (10) of the twenty (20) Main Steam Safety Valve (MSSV) as-found relief settings were out of the tolerance limits specified in Technical Specification (TS) 3.7.1.1 and in the testing requirements established by APS. The testing and adjustments were performed during the period of March 13 through March 15, 1991, while Unit 3 was in Mode 1, to verify the MSSV relief settings.

After shutdown for a scheduled refueling outage, the Unit 3 Pressurizer Code Safety Valves (PSV) were removed and sent to an offsite testing lab. The Unit 3 PSVs were tested April 1 and 2, 1991 and three (3) of the four (4) PSV as-found relief settings were out of the tolerance limits specified in TS 3.4.2.2 and in the testing requirements established by APS.

The cause of the event is setpoint drift. As immediate corrective action the MSSVs and PSVs have been adjusted and tested satisfactorily. A safety analysis determined that the as-found setpoints would not have resulted in any safety limits being violated.

Previous similar events were reported in MSSV LERs 528/88-014-01, 528/89-010-00, 529/89-002-00, 529/89-007-00 and PSV LERs 528/89-007-01 and 529/90-004-01.

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

On March 13 through 15, 1991 Palo Verde Unit 3 was in Mode 1 (POWER OPERATION) at approximately 70 percent power.

B. Reportable Event Description (Including Dates and Approximate Times of Major Occurrences):

Event Classification: Condition Prohibited by the Plant's Technical Specifications.

Palo Verde Unit 3 is a two-loop pressurized water reactor (PWR). Each loop has a vertical U-tube steam generator (SG)(AB) with two outlet main steam lines (SB). Overpressure protection for the shell side of the steam generators and the main steam lines up to the inlet of the turbine (TRB) stop valve (SHV)(TA) is provided by twenty (20) flanged, spring-loaded, direct acting, ASME Code safety valves (RV)(SB) which have open bonnets and discharge to the atmosphere. These safety valves are mounted on each of the main steam lines upstream of the Main Steam Isolation Valves (MSIV)(ISV)(SB) but outside the Containment (CTMT)(NH). The opening pressure of the valves is set in accordance with ASME Code and Technical Specification (TS) requirements. The valves are set to lift sequentially at 1250, 1290, and 1315 pounds per square inch-gauge (psig).

The Main Steam Safety Valves (MSSV)(SB) are required by Technical Specification 4.7.1.1 and the ASME Code to be tested once per five (5) years. The testing is conducted using an approved surveillance test procedure. The surveillance test verifies the actual pressure setpoint and that operation of the MSSVs is acceptable for continued service. The testing is conducted using the Furmanite Trevitest method, which involves the use of hydraulic force to assist in overcoming the closing force of the valve spring. The applied force is measured, recorded, and analyzed to determine lift setpoint. In order to have an acceptable test, three (3) consecutive lifts must be within plus or minus one (1) percent of the nominal setpoint pressure for the valve. The testing sequence involves declaring a safety valve inoperable, installing the testing device, and then testing until three consecutive acceptable lifts are performed. If three consecutive acceptable lifts cannot be made, the valves are adjusted until the acceptance criteria is satisfied. After three successful lifts, the valve is returned to service. The process

of testing, adjusting (where necessary) and retesting until satisfactory results are achieved normally encompasses less than four (4) hours per valve.

On March 15, 1991, engineering personnel (utility, non-licensed) completed a review of data obtained from MSSV testing conducted in Unit 3 from March 13 through March 15, 1991. This testing was being conducted at less than the five (5) year interval in accordance with corrective action for the out-of-tolerance relief settings in Units 1 and 2 as reported in Licensee Event Reports(LER) 528/88-014-01, 528/89-010-00, 529/89-002-00, and 529/89-007-00.

Based upon a review of the actual test results, ten (10) of twenty (20) MSSV as-found relief settings were out of tolerance. Two (2) MSSV setpoints were below specification and eight (8) MSSV as-found relief settings were above specification. The maximum deviations from setpoint of the as-found settings was 2.8 percent low and 1.7 percent high. The following information is provided concerning the Unit 3 MSSVs:

- Six (6) MSSV relief settings were acceptable and did not require adjustment;
- Five (5) MSSV relief settings were out of tolerance upon initial testing and required adjustment;
- Five (5) MSSV relief settings appeared to be out of tolerance on the initial lift; however, no adjustments were necessary since subsequent lifts were within tolerance; and
- Four (4) MSSV relief settings were acceptable on the initial lift, however, subsequent lifts were out of tolerance. Adjustments were necessary to obtain three (3) consecutive acceptable lifts for these safety valves.

Overpressure protection for the primary loops (AB) is provided by four (4) direct acting, spring loaded, stainless steel code safety valves (RV)(AB) with enclosed bonnets. These valves are mounted on the top of the pressurizer. The valve opening pressure is set in accordance with ASME Code and Technical Specification requirements. The valves are all set to lift at 2485 psig plus or minus one percent (2463 to 2510 psig).

The Pressurizer Code Safety Valves (PSVs) are required by TS 4.4.2.2 to be tested once per five (5) years. The PSVs are removed for testing after the plant is shutdown for refueling and

sent to an offsite testing facility (Wyle Laboratories). The PSVs are tested in accordance with approved procedures under elevated steam pressure conditions. In order to have an acceptable test, three (3) consecutive lifts must be within plus or minus one (1) percent of the nominal setpoint pressure of the valve. The testing verifies that the set pressure and operation of the PSVs are acceptable for continued service.

On March 16, 1991, Unit 3 shutdown for a planned refueling outage. During the refueling outage, in March 1991, the PSVs were removed and sent to Wyle Laboratories for scheduled testing. On April 2, 1991, engineering personnel (utility , non-licensed) completed a review of data obtained from PSV testing conducted by the offsite testing lab during April 1 and 2, 1991. Three (3) of the four (4) PSV as-found relief settings were out of tolerance. The out-of-tolerance lift setpoints were 2.5 percent, 3.3 percent, and 3.4 percent above the required relief setting. The following information is provided concerning the Unit 3 PSVs:

- One (1) PSV relief setting was acceptable and did not require adjustment;
- Two (2) PSV relief settings were out of tolerance upon initial testing and required adjustment; and
- One (1) PSV relief setting appeared to be out of tolerance on the initial lift, however, no adjustments were necessary since subsequent lifts were within tolerance.

Since ten (10) of the twenty (20) MSSV and three (3) of the four (4) PSV as-found relief settings were outside the TS limit, it is assumed that one or more of these valves were outside the TS limit during operation. Therefore it is assumed that the OPERABILITY requirements and the associated ACTIONS were not met for TS 3.4.2.2 and 3.7.1.1.

C. Status of structures, systems, or components that were inoperable at the start of the event that contributed to the event:

Other than the MSSVs and PSVs described in Section I.B, no structures, systems, or components were inoperable which contributed to the event.

D. Cause of each component or system failure, if known:

Not applicable - no component or system failures were involved.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Palo Verde Unit 3	0 5 0 0 0 5 3 0	9 1	— 0 0 1	— 0 1	0 5 OF 0 8

TEXT *(If more space is required, use additional NRC Form 366A's)* (17)

E. Failure mode, mechanism, and effect of each failed component, if known:

Not applicable - no component failures were involved.

F. For failures of components with multiple functions, list of systems or secondary functions that were also affected:

Not applicable - no component failures were involved.

G. For a failure that rendered a train of a safety system inoperable, estimated time elapsed from the discovery of the failure until the train was returned to service:

Not applicable - no failures were involved which rendered a train of a safety system inoperable.

H. Method of discovery of each component or system failure or procedural error:

Not applicable - there have been no component or system failures or procedural errors identified.

I. Cause of Event:

The MSSVs and PSVs are subject to setpoint drift (SALP Cause Code X: Other). This is a repeat event as reported in MSSV LERs 528/88-014-01, 528/89-010-00, 529/89-002-00, and 529/89-007-00 and PSV LERs 528/89-007-01 and 529/90-004-01. Industry and PVNGS experience, indicates that relief and safety valve setpoint drift is within the expected performance of the valve.

The Unit 3 MSSVs were previously tested during the last Unit 3 refueling outage. The MSSVs were tested during this refueling outage as part of the enhanced testing program for MSSVs. The Unit 3 PSVs were last tested prior to initial startup of Unit 3. Unit 3 is currently in their second refueling outage. The PSVs were tested during this refueling outage as part of the enhanced testing program for PSVs.

J. Safety System Response:

Not applicable - there were no safety system responses and none were necessary.

K. Failed Component Information:

Although there were no failed components associated with this event the following data is provided for information:

1. MSSVs:

Manufacturer: Dresser Valve and Controls Division
Dresser Industries, Inc.

Model No: 6" 3707R Consolidated Main Steam Safety Valves
Type 3700

2. PSVs:

Manufacturer: Dresser Valve and Controls Division
Dresser Industries, Inc.

Model No: 6" 31709NA-1 Consolidated Type 31700 Crossed Bonnet Maxiflow Safety Valves.

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

As described above, the MSSVs are intended to provide overpressure protection for the secondary side from the steam generators and main steam lines up to the turbine stop valves. The MSSVs ensure that steam generator pressure remains below 110 percent of design pressure. Review of the as-found condition of the safety valve setpoints found that for the design basis accidents, the MSSVs would have prevented system pressure from exceeding 110 percent of steam generator design pressure and the sequential lifting scheme would have ensured that steam generator integrity would not be compromised. Furthermore, if an event occurred in which the MSIVs remained open, overpressure protection could have been automatically provided by the Steam Bypass Control System (SB). In addition, it should be noted that secondary side pressure is monitored by Reactor Operators in the Control Room (NA), and manual overpressure protection is provided by remote operation of the Atmospheric Dump Valves (SB) from the Control Room.

During operation, all PSVs must be OPERABLE to prevent the Reactor Coolant System (RCS) (AB) from being pressurized above its Safety Limit of 2750 psia. The combined relief capacity of these valves is sufficient to limit the system pressure to within its Safety Limit of 2750 psia following a complete loss of turbine generator (TA) load while operating at RATED THERMAL POWER and assuming no reactor trip until the first Reactor Protective System (JC) trip setpoint (Pressurizer

Pressure-High) is reached (there is no direct reactor trip on the loss of turbine) and also assuming no operation of the atmospheric dump valves (SB) (V).

An analysis has been performed to determine if the as-found condition discussed in Section I.B could have resulted in the RCS being pressurized above the Safety Limit of 2750 psia. The analysis determined that the Safety Limit would not have been exceeded.

III. CORRECTIVE ACTION:

A. Immediate:

Five (5) MSSVs were out of tolerance upon initial testing and required adjustment. These valves were adjusted and successfully retested. Five (5) MSSVs were out of tolerance upon initial testing and subsequent lifts were within limits. No adjustments were necessary for these valves. Four (4) MSSVs were acceptable upon initial lifts; however, subsequent lifts were out of tolerance and these valves were also adjusted and successfully retested. The remaining six (6) MSSVs were satisfactory on the initial and subsequent lifts, and did not require adjustment. Twenty (20) MSSVs were successfully tested a minimum of three (3) consecutive times.

Two (2) PSVs were out of tolerance upon initial testing and required adjustment. One of these PSVs had been previously scheduled for disassembly. No problems were noted that could have affected the valve relief settings. This valve was reassembled, adjusted and successfully retested.

One (1) PSV was out of tolerance upon initial testing and subsequent lifts were within limits. No adjustment was necessary for this valve. The remaining PSV was satisfactory on the initial and subsequent lifts and did not require adjustment. Both of the PSVs which did not require adjustment had been previously scheduled for disassembly. These valves were reassembled, adjusted and successfully retested.

B. Action to Prevent Recurrence:

Since field setpoint adjustment was successfully accomplished in accordance with the Technical Manual, no further corrective action is necessary at this time.

Due to the tendency toward setpoint drift exhibited by these valves, MSSV testing will continue on a refueling schedule until engineering determines that a longer interval is appropriate. Based on the results of the PSV testing in Units 1, 2, and 3, PSV testing will also be performed on a refueling schedule until engineering determines that a longer interval is appropriate.

An ongoing investigation is in progress to determine if any actions can be taken to reduce the setpoint drift. If any significant actions are identified which reduce setpoint drift, a supplement to this report will be issued.

APS submitted an amendment to the TS to increase the tolerance on the MSSV and PSV setpoints (161-03587-WFC/JSC, dated November 13, 1990).

IV. PREVIOUS SIMILAR EVENTS:

MSSV LERs 528/88-014-01, 528/89-010-00, 529/89-002-00, and 529/89-007-00 described events where MSSVs were out of the tolerance limits specified in Technical Specification 3.7.1.1. Corrective action for these MSSV events included readjustment of the valves and an administrative reduction of the five (5) year testing interval. PSV LERs 528/89-007-01 and 529/90-004-01 described events where PSVs were out of the tolerance limits specified in Technical Specification 3.4.2.2. Corrective action for these PSV events included readjustment of the valves.

Previous corrective actions could not have prevented these events because it would not affect the tendency toward setpoint drift exhibited by the MSSVs and PSVs.