10 CFR 50.73

A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear Generating Station

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102-05742-DCM/DJS
September 07, 2007

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

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528
License No. NPF-41
Licensee Event Report 2007-001-00

Attached please find Licensee Event Report (LER) 50-528/2007-001-00 that has been prepared and submitted pursuant to 10 CFR 50.73. This LER reports the failure of a containment isolation system check valve to properly seat.

Arizona Public Service Company makes no commitments in this letter.

In accordance with 10 CFR 50.73(d), copies of this LER are being forwarded to the NRC Regional Office, NRC Region IV and the Senior Resident Inspector. If you have questions regarding this submittal, please contact Ray E. Buzard, Section Leader, Regulatory Affairs, at (623) 393-5317.

Sincerely,

D.C. Mims

DCM/DJS/gat

Attachment

cc: B. S. Mallett — NRC Region IV Regional Administrator
M. T. Markley — NRC NRR Project Manager - (send electronic and paper)
G. G. Warnick — NRC Senior Resident Inspector for PVNGS

IE22

NRR

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(6-2004)
LICENSEE EVENT REPORT (LER)
(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory 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 and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 an information

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE
TECHNICAL SPECIFICATION PROHIBITED CONDITION DUE TO CHECK VALVE NOT FULLY SEATED

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
07	05	2007	2007	- 001 -	00	09	07	2007	FACILITY NAME	DOCKET NUMBER **05000**

9. OPERATING MODE
3

10. POWER LEVEL
000

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER
  Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Ray E. Buzard, Section Leader, Regulatory Affairs	623-393-5317

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	BQ	V	B350	Y					

14. SUPPLEMENTAL REPORT EXPECTED
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On July 5, 2007, with Unit 1 in MODE 3, Hot Standby, a containment isolation check valve failed to fully seat as indicated by surveillance testing. Containment Isolation check valve 1PSIEV123 (SI-123) was not in its fully seated position at the time of entry into a condition that required the valve to be OPERABLE.

The check valve is a Borg-Warner (B-W), 3 inch, ASME Class 2, bonnet hung, swing check valve, located on the high pressure safety injection system (HPSI) cold-leg injection piping inside containment. This check valve functions as a containment isolation valve that is open during certain accident conditions.

The valve internals were replaced and surveillance testing was successfully performed. Preliminary investigation results indicate the valve failure is attributable to binding in the spherical bearing resulting from excessive wear between the spherical bearing and the swing arm.

A similar event was reported in LER 1-2006-005-00 for a failure of a B-W Low Pressure Safety Injection (LPSI) valve in November 2006.

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

All times are Mountain Standard Time and approximate unless otherwise indicated.

1. REPORTING REQUIREMENT(S):

This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) to report a condition prohibited by the Technical Specifications (TS).

On July 2, 2007, at 1621 hours operations personnel placed the reactor coolant system (RCS)(EIIS: AB) in MODE 4, Hot Shutdown. The plant was transitioned to MODE 3 on July 4, 2007, at 1028 hours. The TS requires each containment isolation valve (CIAS)(EIIS: JM) to be OPERABLE for these mode changes. However, containment isolation check valve 1PSIEV123 (SI-123)(EIIS: V) was not in its fully seated position at the time of the two MODE changes. Proper operation of the check valve is verified in accordance with TS 5.5.8, In-Service Test program (IST) with the plant in MODE 3 and RCS pressure greater than 1600 psia. Operations personnel were not aware of the status (and could not have known as the plant conditions had not been achieved to perform the surveillance test) of the check valve not being in its fully seated position until 1425 hours on July 5, 2007, when testing of the check valve was able to be performed and revealed that the valve was not seated. The most recent successful surveillance test prior to this event was completed in October 2006. Changing MODEs to MODE 4 and 3 with the check valve not seated is a condition prohibited by TS.

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

The function of the ECCS is to provide core cooling and negative reactivity to ensure that the reactor core is protected after certain accidents. Two redundant, 100% capacity trains are provided. In MODEs 1 and 2, and MODE 3 with pressurizer pressure (EIIS: PZR) greater than or equal to 1837 psia or with RCS cold leg temperature (Tc) greater than or equal to 485°F both trains are required to be OPERABLE with each train consisting of High Pressure Safety Injection (HPSI)(EIIS: BQ) and Low Pressure Safety Injection (LPSI)(EIIS: BP) subsystems. This ensures that 100% of the core cooling requirements can be provided in the event of a single active failure.

SI-123 is a Borg-Warner (B-W), 3 inch, ASME Class 2, bonnet hung, swing check valve, located on the HPSI cold-leg injection piping inside containment. This valve functions as a containment isolation (EIIS: BD) valve that is open during certain accident conditions.

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3. INITIAL PLANT CONDITIONS:

On July 5, 2007, Unit 1 was in MODE 3 and activities were in progress to return the plant to power operation following a refueling outage (1R13). There were no structures, systems, or components that were inoperable at the time of discovery that contributed to this condition.

4. EVENT DESCRIPTION:

On July 2, 2007, at 1621 hours, Unit 1 entered MODE 4 (Hot Shutdown) and on July 4, 2007, at 1028 hours, entered MODE 3 (Hot Standby).

On July 5, 2007, Surveillance Test (ST) 73ST-9SI05, Leak Test of HPSI/LPSI Containment Isolation Check Valves, was being performed following the Unit 1 refueling outage. During the performance of section 8.2 of the ST, it was identified that check valve SI-123 had back leakage. It was subsequently determined the valve was not in its fully seated position.

On July 5, at 1425 hours, SI-123 was declared inoperable and control room personnel entered the applicable TS Required Actions for LCOs 3.6.3 condition A.1, containment isolation function inoperable.

On July 5, at 1804 hours, the Unit was in Compliance with Required Action A.1 when the HPSI Injection Valves (SIA-UV-627 & SIB-UV-626) were de-energized in the closed position for compliance with LCO 3.6.3 requirements (to isolate the containment penetration) due to failure of SI-123 to meet the requirements of 73ST-9SI05 section 8.2.

On July 6, at 0500 hours, the Unit un-isolated the penetration and entered LCO 3.6.3 Condition E, but attempts to seat SI-123 were unsuccessful and at 0919 hours, the Unit exited LCO 3.6.3 Condition E when the Injection Valves (SIA-UV-627 & SIB-UV-626) were de-energized in the closed position for compliance with LCO 3.6.3 requirements.

On July 6, at 1032 hours, the Unit again un-isolated the check valve and entered LCO 3.6.3 Condition E in order to perform 73ST-9SI03 to verify other check valves were fully seated. No additional problems were identified.

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Maintenance on SI-123 required the plant to be placed in MODE 5, Cold Shutdown which was achieved on July 7, at 0347 hours. TS LCO 3.6.3 was exited at that time.

On July 9, 2007, repairs were made to SI-123 and it subsequently tested satisfactorily.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

The condition in which SI-123 did not close on July 5, 2007, did not result in any challenges to fission product barriers or in any offsite releases. Therefore, there were no actual adverse safety consequences as a result of the failure of the valve to close properly. The SI-123 check valve provides for the required containment isolation function in accordance with the General Design Criteria. Failure of this valve, including catastrophic failure and the inability to check flow, does not result in a significant safety issue since there exists significant redundancy in the system design to provide isolation if required.

There were no other failures that rendered a train of a safety system inoperable. The condition would not have prevented the fulfillment of the safety function, and the condition did not result in a safety system functional failure as defined by 10 CFR 50.73(a)(2)(v).

6. CAUSE OF THE EVENT:

An investigation of this event is being conducted in accordance with the PVNGS corrective action program. Preliminary investigation results indicate that the direct cause for the SI-123 HPSI Injection Header Containment Penetration Check Valve not being in its fully seated position is due to binding in the spherical bearing resulting from excessive wear between the spherical bearing and the swing arm.

If information is subsequently developed that would significantly affect a reader's understanding or perception of this event, a supplement to this LER will be submitted.

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

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7. CORRECTIVE ACTIONS:

Check Valve SI-123 was disassembled and inspected. A new bonnet/disc assembly was installed in the valve and the valve passed required testing in Mode 3. Check valves SI-133 (High Pressure Safety Injection Loop Check Valve) and CHVM-70 (Regenerative Heat exchanger check valve) were also worked to optimize their performance.

Any additional corrective actions taken as a result of this event will be implemented in accordance with the PVNGS corrective action program.

8. PREVIOUS SIMILAR EVENTS:

LER 50-528/2006-005-00 reported a condition in which a Low Pressure Safety Injection (LPSI) check valve (SI-134 a Borg-Warner (B-W), 12 inch, bonnet hung, swing check valve), did not close properly. The root cause of this failure was frictional forces, in excess of the force of gravity, acting on the disc assembly which prevented the valve disc from being in its fully seated position. The areas of friction included the disc to seat landing zone, the spherical bearing outside diameter surface against the swing arm bore, and the spherical bearing against the disc/stud raised weld.

Based on the SI-134 event, it was determined that the corrective actions that involve optimizing the B-W swing arm check valve disc assembly and potentially refurbishing the spherical bearing should be applied to 3", 4" and 10" B-W check valves. A procedure revision was made to optimize the disc assembly configuration and refurbish/replace the spherical bearing of all 3", 4", and 10" B-W check valves that are in the IST Program during the next disassembly and inspection.

Check valve SI-123 had been initially scoped to be worked during the refueling outage (1R13) to address a Part 21 issue (2001-27-0) with weld build up and excessive gap between the swing arm and valve disc. However, a perceived shortage of replacement parts led to a reprioritization of maintenance activities. SI-123 had a demonstrated history of non-leakage, so it was selected to be worked at a later date. Had SI-123 received the refurbishing during the refueling outage, the condition could have been prevented. Subsequent investigation revealed that the determination regarding parts unavailability was incorrect.