Palo Verde Nuclear
Generating Station

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10CFR50.73

192-01088-WEI/SAB/RAS
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)
Units 1, 2, and 3
Dockets: 50-528, 50-529, 50-530
Licenses: NPF-41, NPF-51, NPF-74
Licensee Event Report 2001-002-00

Attached please find Licensee Event Report (LER) 50-528/2001-002-00 that has been prepared and submitted pursuant to 10CFR50.73. This LER reports the discovery that a surveillance test procedure used for testing refueling purge containment isolation valves was deficient and resulted in a condition prohibited by the technical specifications.

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

Arizona Public Service Company makes no commitments in this letter.

Sincerely,

WEI/SAB/RAS/kg
Attachment

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

IE22

NRC FORM 366 (1-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 6-30-2001

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)	DOCKET NUMBER (2)	PAGE (3)
Palo Verde Nuclear Generating Station (PVNGS)	05000528	1 OF 5

TITLE (4)

Technical Specification Violation Due to Deficient Test Procedure for Refueling Purge Valves

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
									PVNGS Unit 2	05000529
03	29	2001	2001	– 002	– 00	05	24	2001	FACILITY NAME	DOCKET NUMBER
									PVNGS Unit 3	05000530

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)							
POWER LEVEL (10)	94		20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(i)(C)		50.73(a)(2)(vii)
			20.2201(d)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(A)
			20.2203(a)(1)		20.2203(a)(4)		50.73(a)(2)(ii)(B)		50.73(a)(2)(viii)(B)
			20.2203(a)(2)(i)		50.36(c)(1)(i)(A)		50.73(a)(2)(iii)		50.73(a)(2)(ix)(A)
			20.2203(a)(2)(ii)		50.36(c)(1)(ii)(A)		50.73(a)(2)(iv)(A)		50.73(a)(2)(x)
			20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(v)(A)		73.71(a)(4)
			20.2203(a)(2)(iv)		50.46(a)(3)(ii)		50.73(a)(2)(v)(B)		73.71(a)(5)
			20.2203(a)(2)(v)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(C)		OTHER
			20.2203(a)(2)(vi)	X	50.73(a)(2)(i)(B)		50.73(a)(2)(v)(D)		Specify in Abstract below or in NRC Form 366A

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Daniel G. Marks, Section Leader, Regulatory Affairs	623-393-6492

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU FACTURER	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 29, 2001, engineering personnel informed plant operations personnel that the local leak rate test (LLRT) methodology may not have conservatively quantified leakage rates for the inboard refueling purge valves. Specifically, engineering personnel had determined the LLRT methodology measured leakage using a reverse flow method that may not be equivalent to the leakage through the inboard valves had they been pressurized in the accident direction.

Since the LLRT results may not have conclusively demonstrated the valves' ability to perform their intended safety function, operations personnel in Units 1, 2 and 3 declared the inboard refueling purge valves inoperable and entered the applicable Limiting Condition for Operation. Blind flanges have been installed and tested on refueling purge penetrations 56 and 57 in Units 1, 2, and 3 to ensure penetration integrity.

A previous similar event was reported in LER 50-528/2000-004-00.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Palo Verde Nuclear Generating Station	05000528	2001	-- 002	-- 00	2 OF 5

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

1. REPORTING REQUIREMENT(S):

   APS is reporting this condition pursuant to 10CFR50.73(a)(2)(i)(B), because technical specification (TS) surveillance testing of the inboard refueling purge valves (CPBUV3A and CPAUV2B) (EIIS: ISV) may not have satisfied 10CFR50 Appendix J testing requirements. Therefore, the TS surveillance requirement (SR) for containment isolation valves (SR 3.6.3.6) may not have been met resulting in a condition prohibited by the TS.

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

   Containment Purge (CP) system

   The CP system is designed to purge the containment atmosphere to the plant vent stack while introducing filtered and treated makeup air for personnel during refueling operations and maintenance (refueling purge sub-system), and for limited access periods during power operation (power access purge sub-system).

   The scope of the condition described in this LER is limited to the inboard containment refueling purge sub-system valves CPAUV2B and CPBUV3A in each of the three Units. These Henry Pratt, 1200 series, 42" butterfly type valves have rotating disks with soft seats made of an Ethylene Propylene Terepolymeron (EPT) material. The valves have vertical single offset shafts with disks that rotate into stainless steel seats welded into the valve bodies. The seat has a slight taper which makes leakage more probable with differential pressure in one direction than the other.

   The containment refueling purge valves are ASME Section III Code Class 2 valves and serve as containment isolation valves (CIVs) which are designed to close upon receipt of a containment isolation actuation signal (CIAS) or containment purge isolation actuation signal (CPIAS). The refueling purge valves are normally closed and de-energized during power operation.

3. INITIAL PLANT CONDITIONS:

   On March 29, 2001, Units 1, 2, and 3 were in MODE 1 between 94 and 99 percent power. Other than the condition reported herein, no other inoperable structures, systems or components contributed to this event.

4. EVENT DESCRIPTION:

On March 29, 2001 at approximately 1815 Mountain Standard Time (MST), valve services engineering (VSE) personnel informed plant operations personnel in Units 1, 2 and 3 that the local leak rate test (LLRT) methodology employed at PVNGS may not conservatively quantify leakage rates for the inboard refueling purge valves. Specifically, VSE and a team of APS personnel investigating the reliability of the inboard refueling purge valves during LLRT had determined the leakage measured using a reverse flow method may not be equivalent to the leakage through the inboard valves had they been pressurized in the accident direction (i.e., from the containment side of the penetration).

ANS/ANSI-56.8-1994, which describes the detailed technical methods and techniques for performing Types A, B, and C tests under Appendix J to 10 CFR Part 50, states that methods used to determine leakage rates of primary containment boundaries and isolation valves shall be performed such that test pressure is applied in the same direction as that which would occur during the design basis accident, unless equivalent or more conservative results can be achieved from applying the pressure in a different direction.

Since the LLRT results were now suspect and may not have conclusively demonstrated the valves' ability to perform their intended safety function, operations personnel in Units 1, 2 and 3 declared the inboard refueling purge valves inoperable. Operations personnel immediately entered Limiting Condition for Operation (LCO) 3.6.3, Condition D (one or more penetration flow paths with one or more containment purge valves not within purge valve leakage limits) and verified they were compliant with Action D.1 (to isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve with resilient seals, or blind flange).

5. ASSESSMENT OF SAFETY CONSEQUENCES:

The design basis accidents (DBAs) assumed to result in a release of radioactive material within containment are a loss of coolant accident (LOCA), a main steam line break, a feedwater line break, and a control element assembly ejection accident. In the analysis for each of these accidents, it is assumed that containment isolation valves are either closed or function to close within the required isolation time following event initiation. This ensures that potential paths to the environment through containment isolation valves (including containment purge valves) are minimized. DBA analyses assume that within 60 seconds after the accident, isolation of the containment is complete and leakage is within the design leakage rate, "L_a."

Because of their large size, the refueling purge valves are not qualified for automatic closure from their open position under design basis accident conditions. Therefore, the refueling purge valves are maintained closed in MODES 1, 2, 3, and 4 to ensure the containment boundary is maintained. The purge system valve design precludes a single failure from compromising the containment boundary as long as the system is operated in accordance with the subject LCO.

The refueling purge containment penetrations are periodically tested under the Containment Leakage Rate Testing Program in accordance with TS 5.5.16. It has been determined that testing results for some of the individual inboard refueling purge valves may have been non-conservative. However, past LLRTs have demonstrated the total refueling purge penetration leakage rate met the acceptance criteria (<= 0.05 L_a) and therefore the refueling purge penetrations were capable of performing their intended safety function.

Notwithstanding the aforementioned LLRT results, there may have been brief periods in the past where an inboard refueling purge valve was solely relied upon for penetration integrity and not capable of fulfilling its intended safety function. APS has not conclusively determined that such a condition actually existed and research has not identified firm evidence demonstrating that a safety system functional failure, as defined by 10CFR50.73(a)(2)(v), has occurred.

6. CAUSE OF THE EVENT:

The cause of the event (condition) was the use of a potentially non-conservative test methodology to perform surveillance testing on the inboard refueling purge CIVs. The deficient surveillance test procedure did not satisfy the requirements of ANSI/ANS 56.8-1994, Regulatory Guide 1.163, and TS 5.5.16, in that LLRT results were derived from testing the valves in the non-accident direction which was discovered to be non-conservative relative to testing in the accident direction.

Although engineering personnel have demonstrated the inboard refueling purge valves can be adjusted such that flow can be isolated in either direction, the design and arrangement of the inboard refueling purge valves introduce numerous setup variables that make reliable performance difficult to achieve. If setup incorrectly, these variables can lead to inconsistent and potentially non-conservative correlation between test results and actual valve performance.

7. CORRECTIVE ACTIONS:

Blind flanges have been installed and tested on refueling purge penetrations 56 and 57 in Units 1, 2, and 3.

(Note: Technical Specification LCO 3.6.3 Required Action D. 1 allows the use of blind flanges as isolation devices.)

8. PREVIOUS SIMILAR EVENTS:

LER 50-528/2000-004-00 reported a similar condition where a surveillance test procedure for the refueling purge valves did not measure stem packing leakage of the inboard refueling purge containment isolation valves. The previous LER condition is similar with respect to reverse direction leakage testing and both conditions sprang from the investigation of refueling purge valve performance. However, the underlying conditions are dissimilar in that one is related to disc seating and the other is specific to packing leakage.

Corrective actions taken to prevent recurrence of the previous condition (i.e., revising the surveillance test procedures to include quantification of stem packing leakoff) would not have prevented this condition.