LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Palo Verde Unit 1	0 5 0 0 0 5 2 8	1 OF 12

TITLE (4)
Safety Injection Discharge Check Valve Reverse Flow Causes Condition Outside Design Basis

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBERS
									Palo Verde Unit 2	0 5 0 0 0 5 2 9
0 5	0 7	9 8	9 8	- 0 0 6 -	0 1	0 9	0 3	9 8	Palo Verde Unit 3	0 5 0 0 0 5 3 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

OPERATING MODE (9): 1	[ ] 20.402(b)	[ ] 20.405(c)	[ ] 50.73(a)(2)(iv)	[ ] 73.71(b)
POWER LEVEL (10): 1 0 0	[ ] 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)	[X] 50.73(a)(2)(vii)	[ ] OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	[ ] 20.405(a)(1)(iii)	[X] 50.73(a)(2)(i)	[ ] 50.73(a)(2)(viii)(A)	
	[ ] 20.405(a)(1)(iv)	[X] 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 (12)

NAME	TELEPHONE NUMBER (AREA CODE)
Daniel G. Marks, Section Leader, Regulatory Affairs	6 0 2 3 9 3 - 6 4 9 2

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS
A	B Q	V	B 3 5 0							
B	B Q	V	B 3 5 0							

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 fifteen single-space typewritten lines) (16)

On May 7, 1998, Palo Verde Units 1, 2 and 3 were in Mode 1 (POWER OPERATION), operating at approximately 100 percent power when engineering personnel determined there was sufficient evidence to conclude the Unit 1 "A" train High Pressure Safety Injection pump discharge check valve would not have performed its closure function from October 17, 1996, until April 11, 1998. Engineering personnel believed, at that time, that the repair completed during the Unit 1 seventh refueling outage had corrected the condition. However, on May 13, 1998, it was determined that current valve internal component alignment was suspect. Subsequent testing of the "A" train check valve revealed that, when combined with a HPSI pump failure, reverse flow through the check valve was sufficient to cause less than minimum design injection flow from the redundant train "B" HPSI system. After testing the check valve it was disassembled, examined, reassembled, and tested whereupon it met acceptance criteria. Based on evaluation of "as left" alignment data and surveillance test results from the remaining HPSI check valves, the Unit 2 "B" train check valve was tested on May 14, 1998. This valve also demonstrated excessive reverse flow and was reworked and tested successfully. Further engineering examination revealed no other HPSI check valves were inoperable due to the condition.

No previous similar events have been reported pursuant to 10CFR50.73 in the last three years.

TEXT

1. REPORTING REQUIREMENT:

This LER 528/98-006-01 is being submitted pursuant to the following 10 CFR 50.73 criteria. In addition, a RETRACTION of one of the reporting criteria used during related Emergency Notification System (ENS) reports 34227 and 34246 (made pursuant to 10 CFR 50.72) is included.

10 CFR 50.73(a)(2)(ii)(A and B)

Due to disc misalignment of the Unit 1 "A" and Unit 2 "B" train High Pressure Safety Injection (HPSI)(ECCS)(BQ) pump discharge check valves (V), the design basis minimum flow may not have been met during certain design basis events (DBE) that require HPSI flow. If the corresponding HPSI pump is assumed to fail, the redundant HPSI train could not produce required minimum flow due to reverse flow through the opposite train's check valve, a condition where the Units were outside of the design basis and in an unanalyzed condition.

10 CFR 50.73(a)(2)(i)(B)

The discs in the Unit 1 "A" train, and Unit 2 "B" train HPSI discharge check valves were misaligned since May 1992 and April 1993, respectively. In addition, Unit 3 "A" train HPSI discharge check valve was identified to be cocked from October 1992 until April 1994. This resulted in a condition where the Limiting Condition for Operation (LCO) Allowed Outage Times (AOT) were exceeded resulting in operation or condition prohibited by the plant's Technical Specifications (TS).

10 CFR 50.73(a)(2)(vii)(B and D)

The failure mechanism (immediate cause) of the Unit 1 "A" train, and Unit 2 "B" train and Unit 3 "A" train HPSI discharge check valves was vertical misalignment of the disc which resulted in interference between the disc and valve seat and incomplete valve closure. The failure mechanism was attributed to a common-cause error in assembling the valves, which was a result of inadequate vendor manual and work instructions. Therefore, the assembly error led to multiple failures in systems designed to remove residual heat and mitigate accidents.

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ENS 34227 and 34246

On May 14 and 15, 1998, PVNGS reported that the Unit 1 "A" train and Unit 2 "B" train HPSI pump discharge check valves had back-leakage in excess of acceptance criteria, which indicated design basis minimum flow might not be met (ENS 34227 and 34246 respectively). The condition was reported as being outside the design basis for an extended period time, and the system did not have suitable redundancy (50.72(b)(1)(ii)(B)). In addition, since the check valves could potentially divert flow from the redundant ECCS system, a condition that could have prevented the fulfillment of a safety function, the condition was also reported under 50.72(b)(2)(iii)(D). Subsequent review of NUREG 1022, Revision 1, has revealed that it is not necessary to assume an additional random single failure in systems reported under 50.72(b)(2)(iii)(D) and therefore, this portion of the ENS report is hereby RETRACTED.

2. EVENT DESCRIPTION:

On March 12, 1998, just prior to the beginning of Unit 1's seventh refueling outage, the surveillance test procedure for the HPSI pump discharge check valves was revised to include new acceptance criteria for reverse flow testing. The Unit 1 check valves were the first to be tested using the new acceptance criteria and on April 9, 1998, the Unit 1 "A" train check valve failed to meet the acceptance criteria. Upon disassembly, engineering personnel (other utility personnel) concluded that the valve disc was vertically misaligned high.

Engineering and Maintenance (other utility personnel) personnel believed, at that time, that the vertical misalignment had been corrected during repair of the valve on April 11, 1998, because the valve had been repaired and post maintenance testing demonstrated acceptable reverse direction flow. A significant condition investigation was initiated to determine the root cause of the surveillance test failure. At this time, engineering personnel evaluated other HPSI pump discharge check valve surveillance test records and determined that adequate HPSI flow delivery was available, based on the test results.

On May 7, 1998, Palo Verde Units 1, 2 and 3 were in Mode 1 (POWER OPERATION), operating at approximately 100 percent power when engineering personnel determined there was sufficient evidence to conclude the Unit 1 "A" train check valve would not have performed its closure function from October 17, 1996, until April 11, 1998, when the valve was repaired.

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Engineering concluded, based on a review of the Unit 1 "A" train test data, that the Unit 1 "B" train HPSI delivery flow would not have been met for certain design basis events. If, during these events, the "A" train HPSI pump is assumed to fail, the redundant "B" train HPSI system would not meet design basis minimum flow due to reverse flow through the "A" train check valve.

As the root cause investigation was proceeding, on May 13, 1998, engineering personnel suspected, based on measurements taken from a spare valve, that the Unit 1 "A" HPSI discharge check valve may not have been assembled correctly on April 11, 1998, as previously thought. Engineering personnel were also concerned that if the valve disc was positioned too low in the valve body it could result in a condition where the outside upper edge of the disk could get caught under the inside upper edge of the seat causing the disk to "cock" open. This condition is similar to events described in Information Notice 89-62.

Engineering personnel informed Unit 1 Operations management (other utility personnel) of their concerns regarding the check valve's potential condition. Operations personnel decided to perform surveillance testing on the "A" train HPSI check valve and the "A" train HPSI was declared inoperable, in preparation for the testing, on May 13, 1998, at 1432 MST. The Unit 1 "A" HPSI system was already inoperable, and TS 3.5.2.(a) entered, due to maintenance activities unrelated to the check valve condition. At 1545 MST the "A" train HPSI pump was isolated from the "B" HPSI train in preparation for testing of the "A" train HPSI check valve.

On May 14, 1998, at 0615 MST, the Unit 1 "A" train HPSI discharge check valve was tested using a new test procedure and the valve failed to meet reverse direction flow acceptance criteria. The NRC was notified (ENS 34227) of the test failure. Work began immediately to disassemble and inspect the valve, which confirmed the suspected vertical misalignment of the valve disc. The cause of the misalignment was attributed to a measurement error that occurred during the April 9, 1998, disassembly of the valve. The valve was re-assembled, correcting the misaligned disc condition and when tested met the acceptance criteria, with no observable leakage. Operations personnel returned the valve to an operable status and exited the TS LCO 3.5.2(a) at 1756 MST.

Based on the dimensional data from the spare check valve and the Unit 1 "A" train valve, engineering personnel initiated external dimensional checks on the remaining HPSI pump discharge check valves.

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Dimensional data, maintenance work history and surveillance test records were used to create a matrix which identified valves potentially misaligned and susceptible to "cocking". Engineering personnel established a testing sequence for the remaining valves based upon this matrix.

Data indicated the Unit 2 "B" train check valve had previously passed surveillance testing requirements, but had exhibited elevated reverse direction flow. In addition, external measurements indicated that the disc might be misaligned. Engineering personnel recommended to Unit 2 Operations management that the Unit 2 valve be declared inoperable and reverse flow tested based on their suspicions regarding the check valve's condition. Operations management decided to retest the valve and placed the "B" train HPSI out of service for the test on May 14, 1998, at 2155 MST.

On May 15, 1998, at 1322 MST, the Unit 2 "B" train check valve failed to meet the reverse flow acceptance criteria. The NRC was notified (ENS 34246) of the test failure. The valve was disassembled, the mis-aligned disc condition corrected, and when tested met the acceptance criteria, with no observable leakage. Operations personnel returned the valve to an operable status and exited the TS LCO at 0915 MST, on May 16, 1998.

On May 16, 1998, as a conservative measure a late entry into TS 3.0.3 was made in Unit 1 based on the test results for SIA-V404, which potentially impacted the "B" train HPSI system, and the unrelated "A" HPSI train maintenance activities. In addition, a condition report/disposition request (CRDR) was initiated to determine if the TS 3.0.3 entry was required and to evaluate for reportability. Since then Operations management has determined that entry into LCO 3.0.3 was not required. At the time in question (1432 MST on May 13), a valid surveillance test (ST) was available to demonstrate operability of SIA-V404 and there was reasonable assurance that the system continued to conform to the current license basis (i.e., SIA-V404 met its design function to prevent excess reverse flow leakage). The TS 3.0.3 was retracted on July 31, 1998.

A late entry into TS 3.0.3 was also made on May 16, 1998 for Unit 2. This entry was based on the test results for SIB-V405, which impacted the "A" train HPSI system, and the de-energization of the "B" train HPSI valves in preparation for testing SIB-V405. Operations management has determined that entry into LCO 3.0.3 was not required because at the time in question (2155 MST on May 15), sufficient evidence existed in an OPERABILITY determination that SIB-V405 was OPERABLE based on a review of previous flow data which provided reasonable assurance that SIB-V405 was capable of

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performing its design function of preventing excessive reverse flow leakage. The TS 3.0.3 was retracted on July 31, 1998.

To provide additional assurance that the remaining HPSI pump discharge check valves (Unit 3 "B" train, Unit 1 "B" train, Unit 2 "A" train and Unit 3 "A" train) were operable, each was tested in the order prescribed by engineering.

By May 17, 1998, each valve had been tested and had demonstrated acceptable performance in accordance with the surveillance test acceptance criteria. However, the Unit 1 HPSI "B" train and the Unit 3 HPSI "B" train valves had dimensional values which suggested they may be susceptible to the disc cocking condition in the future. The valves were reworked to optimize valve alignment and the Unit 1 valve was returned to service on May 27, 1998 and the Unit 3 valve on May 20, 1998.

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

The degraded HPSI flow condition did not result in any challenges to the fission product barriers or result in any offsite releases. Therefore there were no actual adverse safety consequences as a result of the event. However, it is known that design basis minimum flow could not have been maintained due to the reverse flow through the opposite train's check valve, a condition where the Units were outside of the design basis and in an unanalyzed condition.

The safety significance of the failed HPSI check valves was evaluated by reviewing possible failure modes. The limiting failure mode has been determined to be degraded HPSI flow delivery of the operating train as a result of reverse flow through the opposite train cocked open check valve.

A determination was made that several events required further evaluation to assess the potential safety impact due to degraded HPSI flow. Updated Final Safety Analysis Report (UFSAR) Chapter 15 Design Bases Events (DBE) for Main Steam Line Break (MSLB) and Steam Generator Tube Rupture (STGR), the UFSAR Chapter 6 ECCS Performance Analysis, and Fire Protection events evaluated for Appendix R (that are impacted by the degraded HPSI condition) all required further evaluation. All other Chapter 15 DBEs were determined to not be adversely impacted by this condition. The results of the analysis demonstrated that sufficient HPSI flow would have been provided to mitigate each event/condition.

TEXT

Main Steam Line Break (MSLB):

A reanalysis was performed to assess the effect of degraded HPSI flow on the limiting MSLB cases for return to power. The limiting hot full power (SLBFP) and hot zero power (SLBZP) cases, both with loss of off-site power were reanalyzed with degraded HPSI flow.

The analysis of record (AOR) for a MSLB is a cycle independent analysis that uses bounding values for moderator temperature coefficient (MTC) and physics data. The reanalysis was performed based on the AOR using MTC and physics assumptions that bound current and past operating cycles, plus the degraded HPSI flow.

The results of the MSLB reanalysis showed that no HPSI flow is required for the SLBFP case, and that reactivity control for the SLBZP case is acceptable despite the degraded HPSI flow. Further, based on a greater margin to return to power conditions, the results of the reanalysis are bounded by the MSLB bounding analysis and 3876 MWt power uprate analyses currently reported in the UFSAR.

Steam Generator Tube Rupture (STGR):

An evaluation was performed on the effect that the degraded HPSI flow would have on the departure from nucleate boiling ratio (DNBR) specified acceptable fuel design limit (SAFDL), the leak rate vs. time, and the integrated leak for the SGTR with a loss-of-offsite-power (LOP). The AOR for the SGTRLOP documents that the minimum DNBR occurs before HPSI flow initiates, thus the degraded HPSI flow does not affect the minimum DNBR.

An evaluation of the effect of degraded HPSI flow on the leak rate vs. time and integrated leak was also performed. Under degraded HPSI flow conditions, no injection occurs until RCS pressure drops below 1350 psia. The delay in HPSI injection results in a more rapid depressurization of the RCS, with less subcooling, and with a corresponding, slight increase in controlled SG steaming to maintain subcooling. This would result in additional voiding of the RCS upper head, however the upper head contains sufficient water mass to support additional depressurization until an RCS pressure of <1200 psia is achieved, at which time the degraded HSPI flow equals or exceeds the leak rate. The overall effect of the degraded HPSI flow is a more rapid depressurization with less subcooling during the early part of the transient, resulting in a reduced leak rate and integrated leak. This has the effect of reducing the corresponding dose consequences.

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The overall effect of the degraded HPSI flow for the SGTR and SGTRLOP events is very similar, resulting in a reduced integrated leak and correspondingly lower dose consequences.

Small Break Loss of Coolant Accident (SBLOCA):

To assess this event, three reactor coolant pump (RCP) discharge leg breaks were reanalyzed; 0.05 ft2, 0.03 ft2 and 0.01 ft2 breaks. The RCP discharge leg is the limiting break location because it maximizes the amount of spillage from the HPSI pump. The 0.05 ft2 break is the limiting break for the PVNGS SBLOCA spectrum in the AOR presented in the UFSAR.

The reanalysis was performed using the input data and initial conditions from the SBLOCA analysis of record. The AOR had originally been performed for 4070MWT stretch power (plus 2% power uncertainty) rather than the 3876MWT actually implemented. . The revised decay heat model, corresponding to core power of 3876 MWt (plus 2% power uncertainty), approximated the 1979 ANS decay heat standard with a +2 sigma uncertainty, as compared to using 120% of the 1971 ANS decay heat standard that is required by Appendix K to 10CFR50.

The initial core power was maintained at the conservatively high AOR value to avoid reinitializing the code at a new set of initial operating conditions.

In addition, the hot rod heat-up portion of the analysis was performed with ABB/CE's SBLOCA Realistic Evaluation Model (REM). The REM improved models for rod-to-coolant heat transfer, cladding oxidation, and cladding swelling and rupture are consistent with the latest NRC approved version of ABB/CE's SBLOCA evaluation model.

The limiting SBLOCA break size for the reanalysis, which resulted in the highest peak cladding temperature, was determined to be the 0.03 ft2 break. The results of the reanalysis were a peak clad temperature of 1742 degrees F, maximum cladding oxidation of 6.00%, maximum core-wide cladding oxidation of <0.733%, and a coolable geometry maintained. These values meet the corresponding acceptance criteria in Appendix K.

In addition, several best estimate simulations of the SBLOCA were performed in the PVNGS simulator to assess the effectiveness of the emergency operating procedures and operator actions for dealing with the effect of the degraded HPSI flow on SBLOCA long term cooling.

These simulations demonstrated that the emergency operating procedure (EOP) guidance contained in the functional recovery procedure would enable

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the operators to successfully cool the RCS despite the degraded HPSI condition.

These results demonstrate that, based on a realistic assessment of the as-found condition, the degraded HPSI flow would have resulted in sufficient HPSI delivery to the RCS to meet the ECCS acceptance criteria of 10CFR50.46 for SBLOCA.

Fire Protection Events:

For Appendix R Fire Events, the charging pump system is utilized for RCS make-up to satisfy the RCS Inventory Control safety function. However, in some of the events the HPSI System has been credited to mitigate Design Basis Fire Events for RCS make-up in lieu of or supplemental to the charging pump system. All the analysis indicated that with the degraded HPSI flow, safe shutdown could have been achieved and maintained.

The following six fire scenarios, when combined with a loss of RCP seal injection and subsequent seal failure resulting in a SBLOCA, were determined to be potentially impacted by the degraded HPSI flow condition:

- Excess Steam Demand due to spurious opening of an atmospheric dump valve.
- Spurious opening of the unorificed RCS gas vent line.
- RCS Depressurization due to spurious opening of pressurizer spray valve.
- Steam Generator (SG) Overfilling due to main feedwater control valve remaining at 100% open after reactor tripped.
- Total Loss of Feedwater.
- RCS Overpressurization due to loss of pressurizer heater control.

To evaluate these scenarios, two simulator sessions were conducted using the plant specific simulator. The simulator sessions were used to determine the limiting multiple failures in the most limiting design basis fire event area that would be representative of a fire event and challenge the safe shutdown criteria. A separate analysis was conducted for events that were not evaluated in the simulator sessions.

The results from the simulator sessions indicated that any fire induced spurious event that will cause RCS depressurization would help mitigate the degraded HPSI flow condition.
Fire Protection Events:

Subcooling margin was maintained in both the simulator sessions, which included multiple fire spurious events occurring at different times during

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the simulator runs. The analysis conducted for the events not evaluated in the simulator sessions also verified that for total loss of feedwater and RCS overpressurization events, subcooling margin was maintained.

All the analysis indicated that with the degraded HPSI flow, safe shutdown could have been achieved and maintained.

The Probabilistic Safety Assessment:

The Probabilistic Risk Assessment (PRA) group (other utility personnel) performed an assessment of the degraded HPSI flow condition. This analysis was performed assuming the degraded HPSI flow would have resulted in core damage and does not consider the results of the deterministic analysis discussed above.

Initiating events that were impacted were identified and a review of operator responses was conducted. PRA's review revealed that current plant procedures and training cover operator response to this event.

Emergency procedures 40EP-9E003, "Loss of Coolant Accident" and 40EP-9E009, "Functional Recovery" address identification of the degraded HPSI flow condition and the required actions to recover the Inventory Control Safety Function. Adequate instrumentation exists for the operating staff to identify the degraded HPSI flow condition.

HPSI pump reliability, which is also used by PRA in determining the safety significance of this condition, has historically been very good. In reviewing the history of failure and demands being tracked for the Maintenance Rule, from the period 1994 to present, there have been no HPSI pump or motor failures in approximately 614 demands. This supports the current estimated failure probability of 6.73 E-4 for the HPSI pump.

PRA analysis of the risk associated with the degraded HPSI flow condition, assuming this condition leads to core damage, resulted in a core damage frequency increase of 3.3 E-05/yr, approximately a 100% increase in the baseline value. This includes the best estimate HPSI pump unavailability due to maintenance performed on the pump. However, the results of the deterministic analyses discussed above are considered, then the increase in core damage frequency related to the degraded HPSI flow condition is negligible.

4. STRUCTURES, SYSTEMS, OR COMPONENTS INFORMATION:

The valves affected by the described condition are manufactured by Borg-Warner and are ASME Class 2, 4 inch, 1500 pound, bonnet pressure seal, two

piece welded body swing check valves. The disc assembly is suspended from the underside of the valve bonnet.

5. CAUSE OF THE EVENTS:

The Unit 1 Train "A" and Unit 2 train "B" HPSI pump discharge check valves failed because the valve discs became "cocked" under the top of the valve seat, preventing full closure. The cause for the valve discs being cocked open is due to vertical misalignment, which was attributed to inadequate maintenance instructions. The primary contributor to the inadequate maintenance instructions was incomplete vendor technical information.

On April 9, 1998, when the Unit 1 "A" train HPSI was disassembled the as-found measurements were incorrectly recorded which led to additional vertical disc misalignment when the valve was reassembled on April 11, 1998. This was attributed to personnel error.

Additional contributors and missed opportunities to identify the condition included: 1) Surveillance test procedures did not confirm the valve discs were seating, 2) lessons learned from in-house and industry operating experience reports were not effectively incorporated into maintenance and testing procedures, and 3) engineering personnel had not recognized the impact excessive reverse flow through the HPSI discharge check valve had on the HPSI delivery capability.

6. CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

Immediate corrective actions were implemented to restore the affected valves to an operable condition. All HPSI discharge check valves discs have been determined to be assembled correctly.

The maintenance instructions in use for check valve assembly had been revised on November 7, 1994 and are currently considered adequate to perform the activity. However, the check valve maintenance instructions were enhanced to include more detailed installation instructions and drawings.

Engineering has completed transportability reviews for other Borg-Warner bonnet hung pressure seal check valves susceptible to vertical disc misalignment caused by retaining ring position. This review determined that the STs for the other valves were adequate to identify valve cocking.

In addition, other valves are one piece (non-welded) design and are not as likely to be susceptible to the "disc cocking" failure.

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Engineering has evaluated transportability to other Inservice Testing (IST) program check valves with closure functions and determined that the vertical misalignment leading to "disc cocking" is not transportable to other types of check valves.

Surveillance Test procedures for IST program check valves with closure functions were reviewed to confirm that the acceptance criteria is appropriate. This review confirmed the testing methodology and acceptance criteria were appropriate for all check valves with a safety related closure function with the exception of an Auxiliary Feedwater (BA) valve AFA-V015 in each unit. This valve was evaluated under a separate CRDR (980862) and retested satisfactorily in all three units. The test method and acceptance criteria for testing were also revised for these valves.

An evaluation will be conducted to determine if other industry operating experience information on complex component assemblies has been properly incorporated. This action will be completed by September 11, 1998. This action was reported in LER 528/98-006-00 as being due on August 31, 1998. The change in the date was discussed with the Senior Resident Inspector and the Region IV Palo Verde Project Branch Chief on August 28, 1998.

Engineering Support Personnel will be briefed on this event during quarterly industry events training.. This action will be completed by December 31, 1998.

7. PREVIOUS SIMILAR EVENTS:

No other previous events have been reported pursuant to 10 CFR 50.73 in the last three years.