

# CATEGORY 1

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ACCESSION NBR:9903080022      DOC.DATE: 99/02/24      NOTARIZED: NO      DOCKET #  
 FACIL:STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi      05000530  
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SUBJECT: LER 99-001-00:on 990125,loss of automatic closure for  
 containment isolation valve.Caused by personnel error for  
 inadequate documentation.Suveillance test 36ST-9A02 was  
 performed & evaluation will be conducted.With 980224 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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192-01040-GRO/DGM/AKK  
February 24, 1999

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)  
Unit 3  
Docket No. STN 50-530  
License No. NPF-74  
Licensee Event Report 99-001-00**

Attached please find Licensee Event Report (LER) 99-001-00 prepared and submitted pursuant to 10 CFR 50.73. This LER reports a condition prohibited by Technical Specification (TS) and a condition that was outside of the design basis of the plant, due to non-compliance with (TS) 3.6.3 for loss of automatic closure function for a containment isolation valve. There are no commitments stated or implied as a result of this event.

In accordance with 10CFR50.73(d), a copy of this LER is being forwarded to the Regional Administrator, NRC Region IV. If you have any questions, please contact Daniel G. Marks, Section Leader, Regulatory Affairs, at (602) 393-6492.

Sincerely,

GRO/DGM/RJH/rlh

Attachment

cc: E. W. Merschoff (all with attachment)  
P. H. Harrell  
M. B. Fields  
J. H. Moorman  
INPO Records Center

9903080022 990224  
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IE2211



## LICENSEE EVENT REPORT (LER)

(See reverse for required number of  
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FACILITY NAME (1)

Palo Verde Nuclear Generating Station Unit 3

DOCKET NUMBER (2)

05000530

PAGE (3)

1 OF 7

TITLE (4)

Loss of Automatic Closure for Containment Isolation Valve

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 NAME	DOCKET NUMBER
01	25	1999	1999	-- 001	00	02	24	1999	N/A	05000
									FACILITY NAME	DOCKET NUMBER
									N/A	05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)				
POWER LEVEL (10)	100	20.2201(b)	20.2203(a)(2)(v)	X	50.73(a)(2)(i)	50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)	X	50.73(a)(2)(ii)	50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)	OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 368A
20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)			

## LICENSEE CONTACT FOR THIS LER (12)

NAME

Daniel G. Marks, Section Leader, Regulatory Affairs

TELEPHONE NUMBER (Include Area Code)

602-393-6492

## 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)

YES

(If yes, complete EXPECTED SUBMISSION DATE).

X

NO

EXPECTED  
SUBMISSION  
DATE (15)

MONTH

DAY

YEAR

## ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 23, 1999 at approximately 0108 MST, Palo Verde Unit 3 was in Mode 1 (power operations), operating at approximately 100% power, when APS control room personnel (licensed operators) identified that inboard containment hydrogen control supply isolation valve (3JHPAUV0001) failed to close as required by Technical Specification (TS) 3.6.3. The condition was discovered during the performance of A train, ESFAS subgroup relay surveillance testing 36ST-9SA01-3. Operations personnel declared the valve inoperable and entered "Condition A" of LCO 3.6.3. On January 23, 1998, at approximately 03:01 MST, control room personnel (licensed operators) isolated the affected penetration flow path by de-activating the automatic function for the outboard hydrogen control supply isolation valve (3JHPAUV0003) for compliance with Action A1 of LCO 3.6.3. Subsequent troubleshooting efforts were conducted and on January 25, 1999 at approximately 1530 MST, maintenance personnel (utility non-licensed) discovered that 3JHPAUV0001 was incorrectly wired and was not discovered by retest. On January 25, 1999, at approximately 2218 MST 3JHPAUV0001 was declared operable. This event is being reported as a condition prohibited by Technical Specification and a condition that was outside of the design basis of the plant from October 22, 1998 at 0301 MST to January 23, 1999 at 0301 MST. The cause of the event is attributed to personnel error for inadequate documentation, performed with second party verification, during the wiring determination which resulted in incorrect wiring retermination. In addition, the post maintenance retest did not include a functional test of the containment isolation actuation signal (CIAS) circuitry. No previous similar events have been reported pursuant to 10CFR50.73.



U.S. NUCLEAR REGULATORY COMMISSION  
**LICENSEE EVENT REPORT (LER)**  
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Palo Verde Nuclear Generating Station	05000530	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 7
		1999 - 001 - 000			

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

# 1. REPORTING REQUIREMENT:

This LER 530/99-001-00 is being submitted to report an event that resulted in an operation or condition prohibited by the plant's Technical Specifications (TS) as specified in 10CFR50.73(a)(2)(i)(B) and as an event or condition that was outside the design basis of the plant as specified in 10CFR50.73(a)(2)(ii).

Specifically, at approximately 0108 MST, on January 23, 1999, Palo Verde Unit 3 was in Mode 1 (power operations), operating at approximately 100% power, when APS control room personnel (utility-licensed operator) identified that the inboard containment hydrogen control supply isolation valve (ISV) (3JHPAUV0001) failed to close as required by Technical Specification (TS) 3.6.3. The condition was discovered during the performance of "A" train, ESFAS subgroup relay (44) surveillance testing, procedure 36ST-9SA01-3. Operations personnel declared the valve inoperable and entered "Condition A" of LCO 3.6.3.

On January 23, 1999, at approximately 03:01 MST, control room personnel (utility-licensed operator) isolated the affected penetration flow path by de-activating the automatic function (IEL) for the outboard hydrogen control supply isolation valve 3JHPAUV0003, for compliance with Action A1 of LCO 3.6.3. By de-activating 3JHPAUV0003, the active single failure criteria was removed and the valve was considered passive in accordance with TS bases 3.6.3.

On January 25, 1999, a subsequent inspection of the valve by maintenance personnel found that the wiring for the valve was not correct per the drawing which resulted in the failure of the valve to close during a containment isolation actuation signal (JM) (CIAS).

Technical Specification 3.6.3 requires that each containment isolation valve be operable in modes 1, 2, 3 and 4 to meet the containment isolation time limits assumed in the safety analysis. From October 22, 1998 at 0301 MST (Mode 4 entry TS applicability), to January 23, 1999 at 0301 MST (valve isolated per TS actions), containment isolation valve 3JHPAUV0001 did not meet the operability requirements of TS 3.6.3.

The containment isolation valves (CIV) must meet the design requirements of 10CFR50.36 (c)(2)(ii) Criterion 3, which functions or actuates to mitigate a design basis accident or transient. The station UFSAR, section 6.2.4 requires containment isolation valves to be capable of isolating containment penetrations in accordance with General Design Criteria, 10CFR50 Appendix A, Criterion 55 and 56. The general design is such that two isolation valves are provided for each containment penetration, one inside containment and one outside containment. Specific maximum allowable actuation times and actuation modes are described in UFSAR Table 6.2.4-1 and 6.2.4-2.



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REPORTING REQUIREMENT cont'd

Containment hydrogen control (BB) supply isolation valves CIVs 3JHPAUV001 and 3JHPAUV003 are active (automatic) isolation valves designed to close (in approximately 12 seconds) without operator action following an accident. These two CIVs are provided in series for penetration (PEN) #35 such that no single credible failure or malfunction will result in the loss of isolation or leakage that exceeds the limits assumed in the safety analysis.

Since 3JHPAUV001 was incorrectly wired and was considered inoperable from October 22, 1998 at 0301 MST, to January 23, 1999 at 0301 MST, the automatic actuation times (approximately 12 seconds) for isolation capability were not satisfied as described in UFSAR. In addition, the GDC 56 criteria requiring two isolation barriers was not satisfied for the same time frame.

An ENS one (1) hour notification was not required since 3JHPAUV001 was inoperable and isolated from its automatic design function on January 23, 1999. Therefore, when the incorrect wiring was discovered, the plant was not in a condition that is outside of the design basis of the plant and is being reported under 10CFR50.73(a)(2)(ii) as a condition that was outside of the design basis of the plant.

2. EVENT DESCRIPTION:

On August 1, 1998 at approximately 1346 MST, Unit 3 control room personnel (utility-licensed operators) and I&C personnel (utility non-licensed) performed surveillance test 36ST-9SA01-3, ESFAS Train A Subgroup Relay Functional Test to verify operability of ESFAS actuation for containment isolation valves. The surveillance test was completed satisfactorily on August 2, 1998 at approximately 2241 MST and verified the as left condition of the containment hydrogen control upstream supply isolation valve, 3JHPAUV0001, as closed. On September 21, 1998, at approximately 0830 MST, Unit 3 control room personnel (utility-licensed operators) performed surveillance test 73ST-3DG01, Integrated Safeguards Surveillance Test - Train A, to verify component position indication for ESFAS actuations. The results of the surveillance indicated that 3JHPAUV0001 was closed upon receiving a CIAS signal and was considered satisfactory.



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**EVENT DESCRIPTION cont'd:**

On September 24, 1998 at approximately 0700 MST, valve services technicians commenced a PM work order to remove and replace the Rotork actuator (20) and perform MOV diagnostic testing on the containment hydrogen control upstream supply isolation valve 3JHPAUV0001.

Due to an unusual valve and actuator configuration, the Rotork actuator had to be removed from the valve to perform static diagnostic testing. Actuator removal required complete electrical determination using a maintenance reterm/determ continuation sheet. The electrical drawing for valve 3JHPAUV0001 (drawing 03-E-HPB-002) identified that wire number 52 should have been removed from the valve bung terminal point 20. A review of the reterm/determ sheet identified that wire number 52 was removed from the bung terminal point 21. The incorrect location was documented on the reterm/determ sheet during the initial lifting of the lead. The actuator was re-installed and electrical terminations completed as identified on the reterm/determ sheet. A functional full stroke test was completed as required by 32MT-9ZZ56 section 3.15.1.2 as-left testing. The functional full stroke test locally verified the valve stroke time, current and motor voltage. The test was completed in accordance with maintenance retest procedure 32MT-9ZZ49 "PM Inspection of Rotork Actuators". The valve was declared operable at this time.

On January 22, 1999, the first scheduled quarterly testing of the "A" train, Subgroup Relay Surveillance, 36ST-9SA01-3, identified that 3JHPAUV0001 would not close upon a test signal to de-energize the ESFAS relay (RLY) K213. Operations personnel declared the valve inoperable and entered "Condition A" of LCO 3.6.3 and initiated troubleshooting efforts. Operations personnel also declared associated A Train equipment such as the hydrogen recombiner, containment hydrogen monitor, and containment atmosphere monitoring inoperable.

On January 23, 1999, at approximately 03:01 MST, control room personnel (licensed operators) isolated the affected penetration flow path by administratively controlling the automatic function for the outboard hydrogen control supply isolation valve (3JHPAUV0003) for compliance with Action A1 of LCO 3.6.3. Subsequent troubleshooting efforts were conducted and on January 25, 1999 at approximately 1530 MST, maintenance personnel (utility non-licensed) discovered that 3JHPAUV0001 was incorrectly wired and was not discovered by retest. On January 25, 1999, at approximately 2218 MST 3JHPAUV0001 was declared operable and compliance with TS 3.6.3 was achieved.

The cause of the event is attributed to personnel error for inadequate determination and second party verification of lifting leads. The contributing cause was an incomplete post maintenance retest on containment isolation valve actuation signal (CIAS) circuitry. There were no safety system actuations and none were required.



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

Containment isolation valves form part of the containment pressure boundary and provide a means for fluid penetrations not serving accident consequence limiting systems to be provided with two isolation barriers that are closed on an automatic isolation signal. These isolation devices are either passive or active (automatic), manual valves or de-activated automatic valves secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Two barriers in series are provided for each penetration so that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analysis. The Design Basis Accidents that result in a release of radioactive material within containment are the Loss of Coolant Accident (LOCA), a Main Steam (SB) Line Break (MSLB), a feedwater (SJ) line break, and a control element assembly ejection accident. In the analysis for each of these accidents, it is assumed that CIVs are either closed or function to close within the required isolation time. The specific systems that are isolated by 3JHPAUV0001 are the A Train hydrogen recombiner (BB), containment hydrogen monitor (BB), and containment atmosphere monitoring (BB) and Post Accident (IP) Sample System (PASS).

These systems are designed for post-accident conditions and return the effluent back to containment. Therefore, there is not a concern with a potential unmonitored radioactive release pathway. The indicated position for both containment isolation valves 3JHPAUV0001 and 3JHPAUV0003 was the closed position from September 24, 1998 to January 23, 1999. Although the potential existed for 3JHPAUV0001 to open during a CIAS signal, the outboard containment isolation valve, 3JHPAUV0003 was operable during that time period, providing the capability to isolate the containment penetration. Control room operators can be alerted to a malfunction of 3JHPAUV0001 by the "Safety Equipment Status System" (SESS) procedure 43AL-3ES2A, alarm (EA) on panel BO2A (ANN), which provides priority operator action to close the outboard CIV, 3JHPAUV0003, if 3JHPAUV0001 fails. In addition, operations personnel had the capability to close 3JHPAUV0001 electrically, by manually overriding the ESFS logic permissive circuitry following a CIAS signal. Therefore, the safety impact for this event was minimal in that the system design and station procedure controls were in place to isolate containment penetration (PEN) number 35 and mitigate the consequences of radioactive material release.

The event did not result in any challenges to the fission product barriers or result in any release of radioactive materials. There were no adverse safety consequences or implications as a result of this event. This event did not adversely affect the safe operation of the plant or health and safety of the public in that no containment purges were in progress at the time and no events requiring ESFAS actuation for containment closure were initiated that would result in a potential release of radioactive material.



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## 4. CAUSE OF THE EVENT:

An independent investigation of this event is being conducted in accordance with the APS Corrective Action Program. A preliminary evaluation has determined that the apparent root cause is attributed to personnel error in that personnel documented the wrong determination point from the valve bung. As a result, ESFAS subgroup relay wiring configuration was not per the design drawing causing 3JHPAUV0001 to fail to meet its intended closure function and resulted in inoperability of the valve. The contributing cause was an incomplete post maintenance retest on containment isolation valve actuation signal (CIAS) circuitry.

An ongoing evaluation is in progress which includes a review of the adequacy of post maintenance retest procedures. If the final evaluation results differ from this determination, a supplement to this report will be submitted to describe the final root cause determination. No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event.

## 5. STRUCTURES, SYSTEMS, OR COMPONENTS INFORMATION:

There are no indications that any structures, systems, or components were inoperable at the start of the event, which contributed, to the event. No component or system failures were involved. No failures of components with multiple functions were involved. No failures that rendered a train of a safety system inoperable were involved.



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## 6. CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

A transportability review was conducted and resulted in the performance of surveillance test 36ST-9SA02, ESFAS Train BA Subgroup Relay Functional Test in Unit's 1 and 3 on February 3, 1999 to verify operability of ESFAS actuation for containment isolation valves, 1JHPBUV0002 and 3JHPBUV0002. The condition was not transportable to any other Unit or system train, except for the two valves identified above.

An ongoing evaluation is being conducted in accordance with the APS Corrective Action Program to address personnel error for failure to adequately document determination of electrical leads. This event will be placed in the Industry Events Continued Training for appropriate maintenance personnel for lessons learned training.

The Valve Services Maintenance procedure 39DP-9ZZ04 will be revised by March 26, 1999 to include retest requirements for MOVs with ESFAS functions. This procedure will contain a matrix that identifies what retest requirements are necessary for the type of work performed.

An independent investigation of this event is being conducted in accordance with the APS Corrective Action Program to include a review of valve services and maintenance activities to ensure that adequate retest procedures and work instructions are implemented for retest/determ of components.

## 7. PREVIOUS SIMILAR EVENTS:

No other previous similar events have been reported pursuant to 19CFR50.73, where the loss of an automatic function for a containment isolation valve occurred in the last three years.

