

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9602290057 DOC. DATE: 96/02/22 NOTARIZED: NO DOCKET #
 FACIL: STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Publi 05000528
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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 95-016-00: on 951212, containment spray TS violation
 occurred due to unrecognized valve failure. Shim/band was
 placed around stator of 1JSIBUV665 motor operator to
 maintain stator in correct position. W/960222 ltr.

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

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Arizona Public Service Company
PALO VERDE NUCLEAR GENERATING STATION
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

192-00961-JML/BAG/RAS
February 22, 1996

JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

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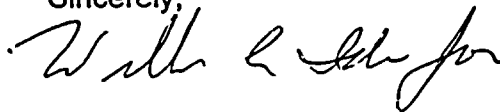
Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528 (License No. NPF-41)
Licensee Event Report 95-016-00**

Attached please find Licensee Event Report (LER) 95-016-00 prepared and submitted pursuant to 10CFR50.73. This LER reports the January 23, 1996 discovery that a Train B Containment Spray pump mini-recirculation isolation valve had been inoperable from December 12, 1995, through December 21, 1995, a condition which exceeded Technical Specification Limiting Conditions for Operation. 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 Burton A. Grabo, Section Leader, Nuclear Regulatory Affairs, at (602) 393-6492.

Sincerely,



JML/BAG/RAS/pv

Attachment

cc: L. J. Callan (all with attachment)
K. E. Perkins
K. E. Johnston
INPO Records Center

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 5 2 8	PAGE (3) 1 OF 0 6
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TITLE (4)
Containment Spray Technical Specification Violation Due to Unrecognized Valve Failure

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
									N/A		
1	2	1 2 9 5	9 5	- 0 1 6	- 0 0	0 2	2 2	9 6	N/A		

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)				
POWER LEVEL (10) 0 3 9	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(b)	
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)	
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 368A)	
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)		
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)		
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(viii)			

LICENSEE CONTACT FOR THIS LER (12)	
NAME Burton A. Grabo, Section Leader, Nuclear Regulatory Affairs	TELEPHONE NUMBER AREA CODE 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	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
E	B	E I S V	B 3 5 0	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On December 19, 1995, Containment Spray pump mini-recirculation isolation valve 1JSIBUV665 failed to stroke closed during surveillance testing (ST). An investigation of the event revealed that 1JSIBUV665 had become inoperable on December 12, 1995, when the tightening of the stator shield set screw resulted in the mechanical binding of the motor operator. Because the valve inoperability was not recognized and corrected within 72 hours, the Technical Specification ACTION time limit was exceeded.

On December 21, 1995, a shim/band was added around the valve operator motor stator to keep it aligned with the rotor and the valve was returned to service at approximately 2200 MST, December 21, 1995.

There have been no previous similar events reported pursuant to 10CFR50.73. (See section 7 for additional information.)

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TEXT

1. REPORTING REQUIREMENT:

This LER (528/95-016-00) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) to report a condition which was prohibited by the plant's Technical Specifications (TS).

A TS violation occurred because the Train B Containment Spray (CS)(BE) pump mini-recirculation isolation valve (1JSIBUV665) was rendered inoperable on December 12, 1995, and the condition was not recognized and corrected within 72 hours as required by TS 3.6.2.1.

2. EVENT DESCRIPTION:

On October 23, 1995, at approximately 1620 MST, Palo Verde Unit 1 was in Mode 1 (POWER OPERATION), operating at approximately 100 percent power, when 1JSIBUV665 failed to open during Engineered Safety Features Actuation System (ESFAS)(JE) relay surveillance testing. Valve Services Engineering (VSE) personnel (other utility personnel) performed a root cause evaluation and determined that the valve had failed due to a motor ground fault which had occurred because the stator had made contact with the motor end bell (see Section 8, Figure 1). Visual examination revealed the stator had incurred minor insulation damage.

It was determined that the stator had contacted the motor end bell because the stator shield was not properly positioned beneath the set screw, or the set screw was not sufficiently tightened which allowed the stator to shift toward the end bell. Additionally, it was determined that the physical orientation of the motor was also a contributing factor, because the actuator was oriented such that gravity and vibration assisted in moving the stator toward the end bell.

On October 24, 1995, the damaged stator was replaced with the only qualified Limitorque SMC-04 stator/rotor replacement kit available on site. During replacement, it was noted that the new stator would not fit into the motor housing. The Work Group Supervisor (other utility personnel) and VSE personnel determined that material would have to be removed from the exterior of one end of the stator iron in order to fit the stator into the motor housing. This was necessary because the SMC-04 type actuators are no longer manufactured, and spare parts and motor dimensional data are not available. Approximately 0.020 inches of material was lathed from the stator iron, and the replacement stator, rotor, and end bell were installed. On October 24, 1995, the valve was successfully stroked several times and returned to an operable status.



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TEXT

Corrective actions were implemented to verify the stator shield set screws were tight on all of the other safety related SMC-04 type Limitorque valve operators. Due to an administrative error, 1JSIBUV665 was included in the list of valves requiring stator shield set screw verification, although it was unnecessary because the valve had been reworked and demonstrated operable.

On December 12, 1995, the stator shield set screw of valve 1JSIBUV665 was verified to be tight by a Valve Services technician. During the verification process, the stator shield set screw was turned one-quarter to one-half turn.

On December 19, 1995, at approximately 1410 MST, Palo Verde Unit 1 was in Mode 1 (POWER OPERATION), operating at approximately 100 percent power when Control Room personnel (utility-licensed, operators) entered Technical Specification Limiting Condition for Operation (TS LCO) 3.6.2.1 following the failure of 1JSIBUV665 to stroke closed during ESFAS relay surveillance testing. Control Room personnel quarantined the valve and its supply breaker until root cause testing could be performed.

Trouble-shooting activities on December 20, 1995, revealed that the motor operator for 1JSIBUV665 had become mechanically bound due to misalignment of the motor stator. Limitorque Engineering (contractor personnel) was contacted and concurred with the VSE determination that the condition could be corrected by placing a .005" thick shim/band around the stator and re-tightening the stator shield set screw. This corrective action was performed, and the valve successfully passed retest requirements and was returned to service. TS LCO 3.6.2.1 was exited at approximately 2200 MST, December 21, 1995.

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

Valve 1JSIBUV665 is a Motor Operated Valve (MOV) that is normally key-locked in the open position. The design function of the valve is to remain open to protect the Containment Spray pump from low flow conditions and to close on a Recirculation Actuation Signal (RAS) (JE) (BE).

Assuming that a large break loss of coolant accident occurred during the period of December 12, 1995, through December 21, 1995, and a downstream solenoid operated inlet valve to the Refueling Water Tank (RWT) (BQ) failed to close during a RAS, the potential existed to exceed 10CFR100 dose limits since an unanalyzed leak path is assumed from the containment (NH) recirculation sump to the RWT which is vented to the Fuel Building (ND)



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TEXT

and eventually to atmosphere. A previously performed calculation concluded 10 percent of the 10CFR100 dose limit would be reached in 30 days with 43 gpm leaking into the RWT (approximately 1.8 million gallons).

While Control Room personnel may not immediately have recognized the failure of 1JSIBUV665 to close on a RAS, Control Room indications available to the operator such as valve position indication, rising RWT levels, and Safety Equipment Actuation System (IB) alarms are available in the Control Room (NA). CS mini-flow rate to the RWT has been calculated to be 224 gpm with the valve fully open. Since Control Room personnel could realistically recognize and terminate the recirculation flow within 30 minutes (which equates to approximately 6720 gallons), the unanalyzed leak path is bounded (i.e., much less than 1.8 million gallons). The safety consequences and implications of this event are low.

The event did not result in any challenges to the fission product barriers or result in any releases of radioactive materials. This event did not adversely affect the safe operation of the plant or the health and safety of the public.

4. CAUSE OF THE EVENT:

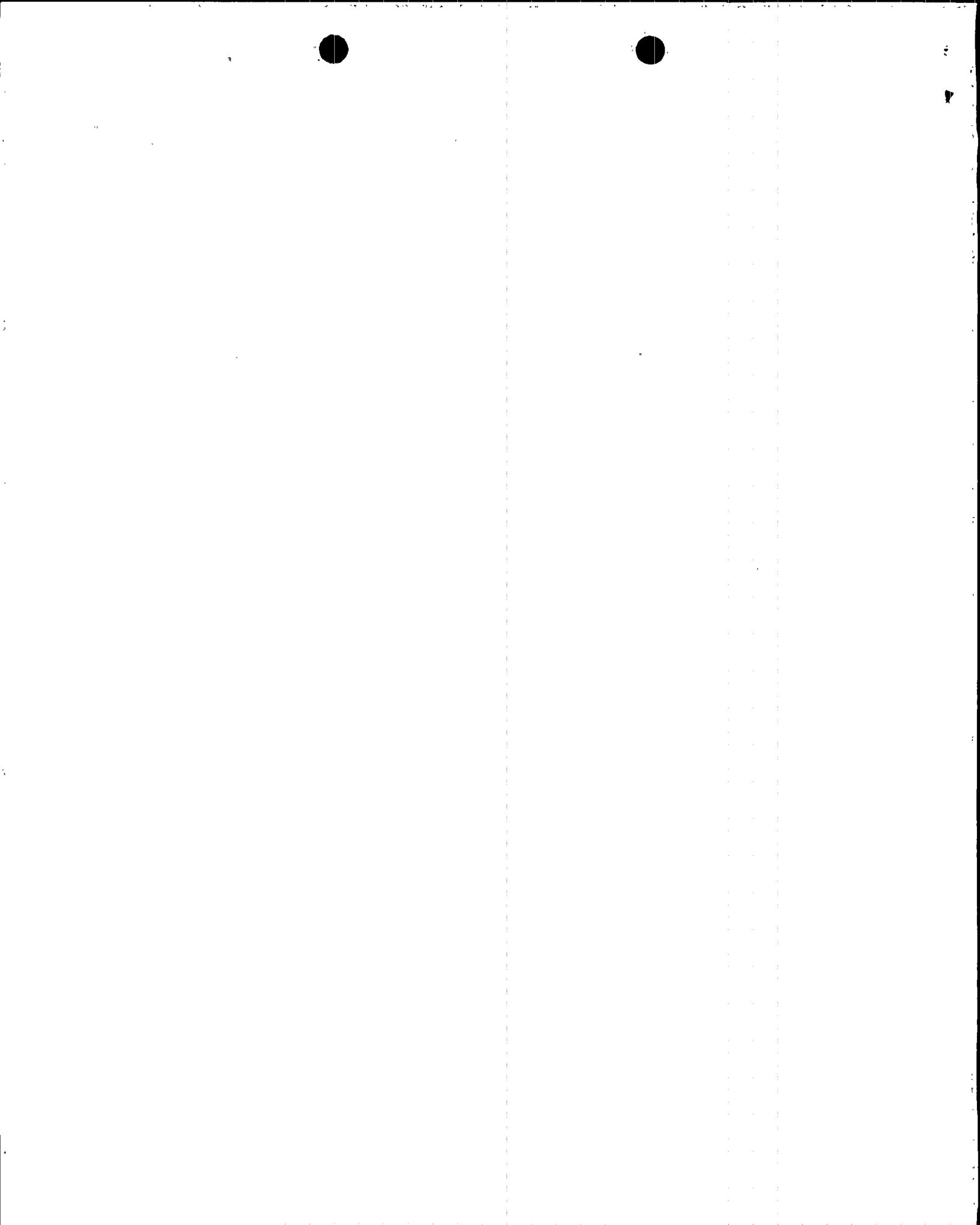
An investigation was conducted in accordance with the APS Corrective Action Program and it was determined (January 23, 1996), that actions taken on December 12, 1995, to verify that 1JSIBUV665's stator set screw was tight, rendered the valve inoperable (SALP Cause Code A: Personnel Error). The investigation also concluded the reason the set screw tightness verification rendered the valve inoperable was that prior lathing activities left the stator with excess clearance.

This valve inoperability was not immediately recognized because the tightening of the stator shield set screw was not expected to affect valve operability and valve retests were not specified.

No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event.

5. STRUCTURE, SYSTEM, OR COMPONENT INFORMATION:

Based upon the investigation of this event, 1JSIBUV665 would not have been able to perform its safety function to automatically close on a RAS and, therefore, 1JSIBUV665 and the Train B CS System were inoperable after the corrective actions performed on December 12, 1995, at approximately 1100



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MST, until 2157 MST, on December 21, 1995 (9 days, 10 hours, and 57 minutes), when 1JSIBUV665 was reworked and successfully passed its post-maintenance retest.

1JSIBUV665 is a Borg Warner 2 inch globe valve, model number 77620, equipped with a Limitorque SMC-04 actuator.

There were no safety system responses and none were necessary.

6. CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

On December 20, 1995, a shim/band was placed around the stator of 1JSIBUV665's motor operator to maintain the stator in the correct position. 1JSIBUV665 was tested and declared operable on December 21, 1995.

On December 20, 1995, 1JSIBUV665's motor actuator was re-oriented to a horizontal position. Work Requests have been initiated to re-orient all applicable SMC-04 operators to a horizontal position. This action will be completed in all three units no later than the end of Unit 3's sixth refueling outage, which is scheduled to end May 07, 1997.

All safety related SMC-04 actuators which were checked for set screw tightness have been verified to be operable.

The lessons learned from these events will be discussed with Valve Services personnel during ongoing Industry Events training. This action will be completed by March 20, 1996.

Procedure 39MT-9ZZ04, "Refurbishment of Limitorque SMC-04 Motor Operated Valves," will be revised to include lessons learned from these events. This action will be completed by March 20, 1996.

7. PREVIOUS SIMILAR EVENTS:

There have been no previous similar events reported pursuant to 10CFR50.73. However, there was one previous event which had a comparable event description and involved a CS pump recirculation valve (2JSIAUV664) which was not recognized as being inoperable (reference LER 529/95-001-00). The previous event did not have the same root cause, failure, or sequence of events.



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TEXT 8. ADDITIONAL INFORMATION:

Figure 1 Limitorque SMC-04 Motor Actuator

