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U.S. Nuclear Regulatory Commission
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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT
LICENSEE EVENT REPORT 00-004 - DISCOVERY OF INOPERABLE CHECK VALVE
CK-ES3332 RESULTS IN PLANT SHUTDOWN

Licensee Event Report (LER) 00-004 is attached. The LER describes the discovery of an inoperable check valve in the common minimum flow recirculation line from Train "A" HPSI and LPSI pumps. Technical Specification 3.0.3 was entered and a plant shutdown was subsequently completed. This event is reportable to the NRC in accordance with 10 CFR 50.73(a)(2)(i)(A) and (B).

SUMMARY OF COMMITMENTS

This letter contains no new commitments and no revisions to existing commitments.


Douglas E. Cooper
Plant General Manager

CC Administrator, Region III, USNRC
Project Manager, NRR, USNRC
NRC Resident Inspector - Palisades

Attachment

IE22

NRC FORM 366 (6-1998)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001 Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an 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)		

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TITLE (4)
DISCOVERY OF INOPERABLE CHECK VALVE CK-ES3332 RESULTS IN PLANT SHUTDOWN

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
09	05	2000	2000	-- 004	-- 00	10	04	2000	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)				
		<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)				
		<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 73.71				
		<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> OTHER				
		<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A				
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)							

LICENSEE CONTACT FOR THIS LER (12)

NAME Daniel G. Malone, Regulatory Compliance Administrator	TELEPHONE NUMBER (Include Area Code) (616) 764-2463
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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)				EXPECTED SUBMISSION DATE (15)		
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

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

On September 5, 2000, at 1820 hours, with the plant at approximately 100% power, radiography of check valve CK-ES3332 in the Train "A" common minimum flow recirculation line from High Pressure Safety Injection (HPSI) Pump P-66A and Low Pressure Safety Injection (LPSI) Pump P-67A revealed that the check valve's disc/arm assembly was detached from the hinge pin and was positioned in the bottom of the check valve body. CK-ES3332 was declared inoperable and Technical Specification 3.0.3 was entered.

At 1901 hours, plant shutdown was commenced, with shutdown being completed at 2353 hours. Plant cooldown to less than 300 degrees F was completed on September 6, 2000, at 1813 hours, at which time the plant exited Technical Specification 3.0.3.

The event resulted from the failure to properly assemble check valve CK-ES3332 from original plant construction. CK-ES3332 was inspected and reassembled, restoring it to its intended condition.

The event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(A) and (B) as both the completion of a shutdown required by Technical Specifications and as a condition prohibited by Technical Specifications.

There were no failure consequences identified for the Emergency Core Cooling System as the result of this condition, and therefore, no impact on plant risk.

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

EVENT DESCRIPTION

On September 5, 2000, at 1820 hours, with the plant at approximately 100% power, radiography of check valve CK-ES3332 [V;BQ,BP] in the Train "A" common minimum flow recirculation line from High Pressure Safety Injection (HPSI) Pump P-66A [P;BQ] and Low Pressure Safety Injection (LPSI) Pump P-67A [P;BP] revealed that the check valve's disc/arm assembly was detached from the hinge pin and was positioned in the bottom of the check valve body. Check valve CK-ES3332 was declared inoperable and Technical Specification 3.0.3 was entered based upon the potential for loose parts to affect additional components in the Emergency Core Cooling System (ECCS) [BQ,BP].

At 1901 hours, plant shutdown was commenced. Action was then taken to disable HPSI Pump P-66A and LPSI Pump P-67A to further preclude the possibility of recirculation flow from either pump causing movement of potential loose parts. The coincident inoperability of HPSI Pump P-66A and LPSI Pump P-67A is a condition prohibited by Technical Specification 3.3.2.

Plant shutdown was completed at 2353 hours. Plant cooldown to less than 300 degrees F was completed on September 6, 2000, at 1813 hours, at which time the plant was no longer in an applicable condition of Technical Specification 3.3, allowing exit from Technical Specification 3.0.3.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(A) and (B) as both the completion of a shutdown required by Technical Specifications and as a condition prohibited by Technical Specifications.

ANALYSIS OF THE EVENT

CK-ES3332 is a horizontally mounted, four-inch swing type check valve. The initial supposition for the apparent condition of CK-ES3332 was service induced failure. However, when CK-ES3332 was opened for inspection, it was discovered that the disc/arm assembly was completely intact, positioned in the bottom of the valve body and exhibiting no indication of failure from service wear. Accordingly, it was determined that the disc/arm assembly had not been attached to the hinge pin. This condition has likely existed since original plant construction, dating back approximately 30 years.

CK-ES3332 has a safety function in the open direction to pass adequate minimum flow for HPSI Pump P-66A and LPSI Pump P-67A. There is no concern with past operability of CK-ES3332 for flow in the open direction since observation over many years of pump operation and routine surveillance has demonstrated that the as-found condition of CK-ES3332 was not restricting recirculation flow.

Normally, CK-ES3332 has no safety function in the closed direction due to additional upstream check valves CK-ES3340 [V;BQ] and CK-ES3233 [V;BP] for HPSI Pump P-66A and LPSI Pump P-67A, respectively. The upstream check valves are normally relied upon

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for closure in order to prevent the potential over-pressurization of an idle pump's suction piping.

In the ten day period between June 23, 2000, and July 2, 2000, CK-ES3332 was credited with the closed safety function when it was discovered that upstream HPSI check valve CK-ES3340 was stuck in a mid-open position and therefore, inoperable for the closed safety function. Since CK-ES3332 was, itself, incapable of providing the closed safety function for this ten day period, CK-ES3332 should be considered to have been inoperable. Technical Specification 3.3.2.f allows a valve which is required to function during accident conditions to be inoperable for no more than 24 hours. The ten day period of inoperability for CK-ES3332 exceeded the Technical Specification allowed outage time and resulted in a separate instance of operation prohibited by Technical Specifications.

In June 2000, prior to crediting CK-ES3332 with the closed safety function, non-intrusive testing (acoustic testing) was performed on CK-ES3332 resulting in apparent open and closed indications. Based upon the as-found condition of CK-ES3332, it can now be assumed that the apparent open and closed indications were caused by the disc/arm assembly responding to changes in flow.

SAFETY SIGNIFICANCE

The Palisades Probabilistic Safety Assessment (PSA) was evaluated for the risk impact due to CK-ES3332 being unable to provide the closed safety function. The only period during which the as-found condition of CK-ES3332 would have caused potential concerns was during the ten day period when it was credited with a closed safety function. Since neither CK-ES3332 nor CK-ES3340 were capable of closure during this time period, an evaluation of possible operating and accident scenarios was performed to identify the maximum pressure that could be experienced in HPSI Pump P-66A suction piping for comparison to design pressure ratings. The section of piping between HPSI Pump P-66A, upstream check valve CK-ES3183 [V;BQ] and upstream branch isolation valve CV-3071 [V;BE] was identified as having the potential to be pressurized beyond design pressure to a maximum of 1250 psi. While this section of piping is rated for 500 psi, and the aforementioned valves are rated for 300 psi, evaluation has concluded that the piping and valves would have maintained structural integrity under this increased pressure loading.

Since there were no failure consequences identified for the ECCS as the result of this condition, there was no impact on plant risk.

CAUSE OF THE EVENT

The event resulted from the failure to properly assemble check valve CK-ES3332 from original plant construction.

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The actual condition of CK-ES3332 was not ascertained in June 2000, during acoustic testing, because the results obtained from the acoustic testing corresponded with generically expected open and closed indications.

CORRECTIVE ACTIONS

CK-ES3332 was inspected and reassembled, restoring it to its intended condition.

A review of all safety related check valves was performed to ensure that an adequate basis exists to conclude that each check valve is functioning properly. Where necessary, corroborating data was obtained via additional testing.

PREVIOUS RELATED EVENTS

LER 97-013 Failure To Closure Test Two Check Valves Results In Violation Of Technical Specification 6.5.7