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November 18, 1999

U.S. Nuclear Regulatory Commission
Mail Stop P1-37
Washington, D.C. 20555

Attention: Document Control Desk

SUBJECT: Grand Gulf Nuclear Station
Docket No. 50-416
License No. NPF-29
Containment Isolation Valve Failed Repeatedly
LER 1999-005-00

GNRO-99/00087

Gentlemen:

Attached is Licensee Event Report (LER) 1999-005-00 which is a final report.

Yours truly,

WAE/CDH
attachment

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LICENSEE EVENT REPORT (LER)					DOCKET NUMBER (2) 05000-416		PAGE (3) 1 of 4				
FACILITY NAME (1) Grand Gulf Nuclear Station, Unit 1					TITLE (4) Containment Isolation Valve P41F169B Failed Repeatedly						
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	
10	19	1999	1999	-- 005	-- 00	11	18	1999	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)		<input checked="" type="checkbox"/>		50.73(a)(2)(i)		
			20.2203(a)(1)		20.2203(a)(3)(i)				50.73(a)(2)(ii)		
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)				50.73(a)(2)(iii)		
			20.2203(a)(2)(ii)		20.2203(a)(4)				50.73(a)(2)(iv)		
			20.2203(a)(2)(iii)		50.36(c)(1)				50.73(a)(2)(v)		
			20.2203(a)(2)(iv)		50.36(c)(2)				50.73(a)(2)(vii)		
									OTHER		
									Specify in Abstract below or in NRC Form 366A		
LICENSEE CONTACT FOR THIS LER (12)											
NAME Milton L. Jones / Senior Technical Specialist						TELEPHONE NUMBER (Include Area Code) 601-437-6198					
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	
X	BS	ISV	Y010	Y							
SUPPLEMENTAL REPORT EXPECTED (14)						EXPECTED SUBMISSION DATE (15)			MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).						<input checked="" type="checkbox"/> NO					
ABSTRACT (Limit to 1400 spaces, i. e., approximately 15 single-spaced typewritten lines) (16)											
<p>On October 2, 1999, the cooling water inlet isolation stop check valve for Drywell Purge Compressor B, a division 2 containment isolation valve, failed its increased frequency monthly surveillance test. This was one month after the valve had been reoriented to a nearly vertical plane and replaced with a new one from stock. Troubleshooting was performed, then the new valve was disassembled in place. Small machining high spots were found and hand sanded. Retest of this work failed. The valve had performed acceptably for years, but began to fail its surveillance recently and with increasing frequency.</p> <p>The cause appears to be binding either between the stem and plug, the plug and barrel, or a combination of all three. The plant has tried machining and polishing to correct irregularities, but that has not precluded the most recent failures.</p> <p>Although root cause analysis is in progress, the decision has been made to replace the valve with one of a different design not as sensitive to disc orientation, with a helper spring to close, and able to perform satisfactorily in raw service water.</p> <p>This event is being reported pursuant to 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(i)(A).</p>											

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(6-1998)

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LICENSEE EVENT REPORT (LER)

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Grand Gulf Nuclear Station, Unit 1	05000-416	1999	004	00	2 OF 4

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

A. Reportable Occurrence

The cooling water inlet isolation stop check valve for Drywell Purge Compressor B cooler [BB], a division 2 containment isolation valve, failed its increased frequency monthly surveillance test. Because there had been several other failures of this containment isolation valve, the failure was not assumed to occur at the time of the test. Instead, the problem was deemed to have arisen over a period of time and thus to have existed during plant operation. Therefore, this event is being reported as a condition prohibited by the Technical Specifications pursuant to 10CFR50.73(a)(2)(i)(B).

The plant complied with the Technical Specification requirements for the isolation valve by closing the outboard isolation valve. This action resulted in isolation of cooling water to the Drywell Purge Compressor, which is a 7-day LCO. Prior to expiration of this LCO, the plant was shut down for its refueling outage. Because the valve was not restored to operability by the end of the LCO time period, this event is also being reported pursuant to 10CFR50.73(a)(2)(i)(A).

B. Initial Conditions

At the time of the event, the reactor was in OPERATIONAL CONDITION 1 with reactor power at approximately 100 percent. Reactor temperature, reactor pressure vessel (RPV) pressure and RPV water level were at approximately 540 degrees F, 1045 psig and 36 inches, respectively. There were no inoperable structures, systems, or components at the start of the event that contributed to the event.

C. Description of OccurrenceEvent history:

Quarterly backflow testing for valve P41F169B was instituted in 1992. The valve failed on 6/22/1995 during the quarterly test. The stem and plug were cleaned and no problems found. A second failure during surveillance occurred on 6/24/1998, and it was cleaned again. When the P41F169A failed to close promptly during its surveillance on 6/29/1998, the disassembly tasks for both valves were changed from 10 years to 3 years.

P41F169B failed during surveillance testing on 5/14/1999, and the valve was cleaned and the internals replaced. Following this failure, Engineering Request (ER) #99-0223 was initiated to reorient the valve to a near vertical orientation during the year 2000. Evaluation of the failure noted that the P41F169B is a "Y" pattern, piston type, stop check valve with the piston travel in the horizontal plane. Operating in the horizontal plane, the effect of gravity to help the valve close was negated, and any sludge, rust, corrosion, or other build-up in the valve body would interfere with proper operation. The horizontal mounting was due to proximity to the containment wall and a cable tray and support mounted directly above the valve. The P41F169A is the same type valve, but it is properly oriented in the vertical plane.

When the P41F169B failed during surveillance testing again on 8/2/1999, the ER priority for reorientation was increased and the reorientation was accomplished on September 3, 1999. During post-modification testing, the valve failed to close as required. The valve was replaced with a new assembly from stock on September 5, 1999, and retested satisfactory.

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

Reportable Event

Valve P41F169B surveillance testing had been increased from quarterly to monthly to build confidence in its performance after reorienting it to near vertical and replacing it with a new valve assembly. On October 2, 1999, P41-F169B failed the increased frequency monthly surveillance. Troubleshooting was performed, then the new valve was disassembled in place. Small machining high spots were found and hand sanded. Retest of this work failed.

Following the failure of the P41F169B valve, operations conservatively declared the F41F169A valve inoperable due to the potential for common mode failure. After further engineering evaluation and special testing of the P41F169A valve, a common mode failure was determined not to be an issue, and the P41F169A was returned to operability.

P41F169B had extensive rework by burnishing and polishing. Extensive shop and installed testing was performed, and this valve was returned to service. Within a short time, P41F169B was tested and failed. On October 19, Operations tested P41F169A and it failed. Operations declared both P41F169A & B inoperable and entered the LCO and took the action to isolate the lines. Isolation of the lines rendered the Drywell Purge Compressors inoperable, which put the plant in the 7-day LCO.

The plant considered returning the valves to an operable condition by modifying the piping design to orient the valve such that the plug moved in a true vertical plane. However, the decision was made to search for a suitable replacement valve not subject to the failure mechanisms identified for the Yarway stop check valve to help ensure long term satisfactory operation.

As a result of this event, Condition Report GGCR 1999-1177 and a Root Cause Analysis were initiated.

D. Apparent Cause

The causal factors appear to be orientation of the valve, binding either between the stem and plug, the plug and barrel, or some combination of these, clearances between the valve body and plug, and water quality. The plant has tried machining and polishing to correct irregularities, but that has not precluded the most recent failures. The plant intends to replace the valve with a different design.

E. Corrective Actions

The plant will replace the P41F169B and P41F169A valves with a different design.

F. Safety Assessment

The safety function of this valve is containment isolation. However, under accident conditions, the valve is normally open to provide cooling water to the drywell purge compressor. This is a containment isolation valve that does not receive an automatic isolation signal. There is another outboard primary containment isolation valve, of a different design, that will satisfy the isolation function if required. The plant remained in compliance with the applicable LCOs, therefore there was no impact on the health and safety of the public.

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

G. Additional Information

Valve data:

Manufacturer: Yarway Corporation

Model: 5551B

Design Standard: ASME Section III

Energy Industry Identification System (EIIIS) codes are identified in the text within brackets [].