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U. S. Nuclear Regulatory Commission
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SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report 50-368/91-018-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i)(B) enclosed is the subject report concerning entry into Technical Specification 3.0.3.

Very truly yours,

James J. Fisicaro
James J. Fisicaro
Director, Licensing

JJF/TFS/mmg
Enclosure

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Arkansas Nuclear One, Unit Two DOCKET NUMBER (2) PAGE (3)
050003681 OF 04

TITLE (4) Service Water Valve Stuck In Intermediate Position Causes Service Water Loop To Be Inoperable Resulting In Entry Into Technical Specification 3.0.3

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 Number(s)		
1	2	09	1991	018	00	0	1	2	4	9	2	050003681	

OPERATING MODE (9) 1 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	Other (Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LICENSEE CONTACT FOR THIS LER (12)

Name: Thomas F. Scott, Nuclear Safety and Licensing Specialist Telephone Number:
Area Code: 501 964-5000

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

Cause	System	Component	Manufacturer	Reportable to NRC	Cause	System	Component	Manufacturer	Reportable to NRC
X	R	1	20C418	Y					

SUPPLEMENT REPORT EXPECTED (14)

Yes (If yes, complete Expected Submission Date) No EXPECTED SUBMISSION DATE (15) Month Day Year

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

On December 30, 1991, a Service Water motor-operated valve stuck in an intermediate position during system realignment from supplying cooling tower basin makeup. This valve is a boundary between the seismic Loop 1 Service Water return header and the non-seismic Auxiliary Cooling Water (ACW) system. Service Water Loop 1 was inoperable because isolation from a pipe break in ACW could not be assured if a seismic event were to have occurred. Since routine maintenance was in progress on one Emergency Feedwater pump and one containment hydrogen analyzer whose operability depended upon Service Water supplied from Loop 2, Loop 1 being inoperable resulted in both Emergency Feedwater pumps and both hydrogen analyzers being inoperable and therefore required entry into Technical Specification 3.0.3. One hydrogen analyzer was restored to operability within twenty five minutes. One Emergency Feedwater pump was operable within forty two minutes to allow exit from Technical Specification 3.0.3. The stuck valve was manually shut after approximately sixteen hours to allow exit from other Technical Specification action statements without any time limits having been exceeded. The root cause of the valve laying stuck will be determined after plant conditions allow removal, inspection, and repair.

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

A. Plant Status

At the time of this event, Arkansas Nuclear One Unit 2 (ANO-2) was operating at approximately 100 percent power. The steam-driven Emergency Feedwater (EFW) [BA] pump, 2P-7A, and the Post-Accident Containment Hydrogen Analyzer [IP], 2C-128B, were removed from service for routine maintenance.

B. Event Description

At 0911 on December 30, 1991, Technical Specification (TS) 3.0.3 was entered due to both trains of EFW and both containment hydrogen analyzers being inoperable.

During the morning of December 30, 1991, ANO-2 Operations personnel were realigning the Service Water (SW) [BI] system valves from supplying make-up to the Circulating Water (CW) [KE] system cooling tower basin [NN]. During this realignment, the cooling tower make-up isolation valve from Loop 1 SW, 2CV-1543-1, tripped the Motor Operated Valve (MOV) thermal overload relay as it was being shut. Operations personnel investigated the situation and found the valve to be approximately 50 percent open. After resetting the thermal overload relays, the valve would not operate electrically or manually in the close direction. Since valve 2CV-1543-1 is a boundary between the seismic SW system and the non-seismic Auxiliary Cooling Water (ACW) [KG] system and there are no isolation valves between the Loop 1 SW return header and 2CV-1543-1, Loop 1 SW was declared to be inoperable because it could not be assured that the loop would be capable of fulfilling its design function if a seismic event were to cause a break downstream of the stuck valve. Loop 1 SW being inoperable caused entry into a 72 hour TS Limiting Condition for Operation (LCO) (TS 3.7.3.1). It also resulted in equipment supplied by Loop 1 SW being inoperable. Auxiliary Building EFW Pump Room Unit Cooler, 2VUC-6B, provides cooling for the room containing the motor-driven EFW pump, 2P-7B, and receives its cooling supply from Loop 1 SW. Declaration of 2VUC-6B inoperable resulted in 2P-7B being inoperable. Loop 1 SW also provides a backup suction source for another reason for having to declare the EFW pump inoperable. Since the steam-driven EFW pump 2P-7A had previously been removed from service for routine maintenance, both trains of EFW were inoperable causing entry into TS 3.0.3 at 0911. The cooler for hydrogen analyzer 2C-128A, 2E-86, receives its cooling supply from Loop 1 SW. Since hydrogen analyzer 2C-128B had also previously been removed from service for routine maintenance, both hydrogen analyzers were inoperable resulting in a second reason for having entered TS 3.0.3.

Due to Loop 1 SW being declared inoperable, other LCO action statements were also entered for having less than the minimum required number of boron injection [CB] flow paths (TS 3.1.2.2), charging pumps [CB] (TS 3.1.2.4), Emergency Core Cooling System (ECCS) [BJ] [BP] subsystems (TS 3.5.2), Containment spray [BE] pumps (TS 3.6.2.1), sodium hydroxide [BE] pumps (TS 3.6.2.2), containment cooling [BK] units (TS 3.6.2.3), control room emergency air conditioning [VI] units (TS 3.7.6.1), and emergency diesel generators [EK] (TS 3.8.1.1).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	EVENT NUMBER (2)	LER NUMBER (6)			PAGE (3)
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

At 0930 the circuit breaker for 2CV-1543-1 was closed. When another attempt was made to close the valve the thermal overload tripped. Electrical Maintenance personnel investigated and determined that the problem was internal binding in the valve, not the motor operator. The valve could not be moved in the close direction but could travel freely in the open direction to greater than the full open indicated position.

Hydrogen analyzer 2C-128B was returned to service at 0936. The steam-driven EFW pump 2P-7A was returned to service at 0953. This allowed exit from TS 3.0.3 forty two minutes after it was entered.

Subsequent efforts by maintenance personnel permitted manual closure of 2CV-1543-1. The valve actuator and lower bearing retainer plate were removed and the valve shaft was jacked toward the lower bearing. Once the valve was shut, the actuator was reinstalled. Operability was restored to Loop 1 SW at 0100 on December 31, 1991, approximately sixteen hours after it had been declared inoperable. This allowed exit from all TS LCOs before any time limits were exceeded.

C. Root Cause

A review of maintenance history, both in site records and NPRDS, for valve 2CV-1543-1 and valves of similar style and type revealed no past problems of this nature. This event was the first occurrence of any failure of valve 2CV-1543-1. There have been no previous corrective maintenance or repair activities performed on this valve. The valve manufacturer was contacted. There have been too few problem reports to document any trend of repeat valve problems and there are no known outstanding industry generic concerns against this type, style, or model valve. The root cause for the valve failure will be determined after plant conditions allow removal, inspection, and repair to ensure that no generic concerns exist.

D. Corrective Action

The valve was placed in a shut position under Operations administrative control with the MOV circuit breaker tagged open.

An evaluation was performed to return the Loop 1 SW to an operable status. The evaluation concluded that operation in this configuration is acceptable until such time as the valve can be repaired. The valve is being maintained shut, its Engineered Safeguards-actuated position, by positioning the mechanical stop adjustment nuts to prevent a change of position. Cooling tower makeup is available from either ACW or Loop 2 SW until 2CV-1543-1 can be returned to service.

Valve 2CV-1543-1 will be inspected and repaired prior to startup following the next refueling outage currently scheduled for September 30, 1992.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		Sequential		Revision				
		Year	Number	Number				
		91	-- 018	-- 00				

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

Based upon the results of the valve inspection, the root cause of the failure and any appropriate additional corrective actions will be determined prior to startup following the next refueling outage.

E. Safety Significance

Loop 1 SW components would have been incapable of fulfilling their safety-related functions only if a seismic event were to have occurred and caused a break in the non-seismic ACW system between valve 2CV-1543-1 and the first ACW isolation valve(s) during the period when the valve was stuck. In this condition, water would have been flowing from SW Loop 1 return header and out of the break. Since the break would have been on the return header, SW would not have been completely stopped through Loop 1 but would have been supplied at a reduced rate. Safety-related equipment supplied by SW would have been available from the redundant SW loop except for the two components causing entry into TS 3.0.3. The hydrogen analyzer was restored to operability within twenty five minutes, well before its use would have been required for an accident initiated coincident with the valve being stuck. The motor-driven EPW pump would have been capable of providing feedwater for some time even without full design SW flow to the room cooler. The normal sources of EPW were available for 2P-7B suction. The steam-driven EPW pump was restored within forty two minutes. Technical Specification 3.0.3 allows one hour to restore equipment or systems to within the provisions of the applicable LCO. Since neither the allowable time limits of TS 3.0.3 nor any of the other applicable LCOs were exceeded and there was a very low probability of a significant seismic event during this short time period, this event is considered to have minimum safety significance.

F. Basis For Reportability

Entry into Technical Specification 3.0.3 represents an operation prohibited by Technical Specifications reportable pursuant to 10CFR50.73(a)(2)(i)(B).

G. Additional Information

Valve 2CV-1543-1 is a motor-operated sixteen inch TRICENTRIC butterfly wafer stop valve, model S, drawing D-0748B, manufactured by the CLOW Corporation (C&S Valve Company).

There have been no similar events reported as Licensee Event Reports at ANO.

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