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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. NPRDS
Licensee Event Report 50-368/91-012-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(vii) enclosed is the subject report.

Very truly yours,

James J. Fisicaro
James J. Fisicaro
Director, Licensing

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cc: Regional Administrator
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NRC Form 366
(6-89)

U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
Expires: 4/30/92

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Arkansas Nuclear One, Unit Two	0 5 0 0 0 3 6 8	1 OF 0 5

TITLE (4) Both Service Water Loops Declared Inoperable Due To Clogging Of Pump Discharge Strainers Caused By A Breakdown In The Implementation Of Procedural Controls

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)
0 4	1 6	9 1	9 1	-- 0 1 2	-- 0 0	0 5	1 5	9 1		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)							
POWER LEVEL (10)	0 0 0	__ 20.402(b)	__ 20.405(c)	__ 50.73(a)(2)(iv)	__ 73.71(b)
		__ 20.405(a)(1)(i)	__ 50.36(c)(1)	__ 50.73(a)(2)(v)	__ 73.71(c)
		__ 20.405(a)(1)(ii)	__ 50.36(c)(2)	X 50.73(a)(2)(vii)	__ Other (Specify in Abstract below and in Text, NRC Form 366A)
		__ 20.405(a)(1)(iii)	X 50.73(a)(2)(i)	__ 50.73(a)(2)(viii)(A)	
		__ 20.405(a)(1)(iv)	__ 50.73(a)(2)(ii)	__ 50.73(a)(2)(viii)(B)	
		__ 20.405(a)(1)(v)	__ 50.73(a)(2)(iii)	__ 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name	Telephone Number
Thomas F. Scott, Nuclear Safety and Licensing Specialist	Area Code 5 0 1 9 6 4 - 5 0 0 0

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	

SUPPLEMENT REPORT EXPECTED (14)	EXPECTED SUBMISSION DATE (15)	Month	Day	Year
__ Yes (If yes, complete Expected Submission Date) X No				

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

On April 16, 1991 both loops of the service water system were declared inoperable for approximately three minutes when a breakdown occurred in the implementation of procedural controls that resulted in debris bypassing screens at the pump suctions and clogging discharge strainers. The traveling screens were being rotated for inspection and lubrication. Sections of the procedure for this activity were performed out of sequence thereby allowing screen rotation without wash water flow. A contributing factor was ineffective communications. Throughout the event cooling water was supplied to both loops but at a reduced capacity. Restoration of one loop to normal pressure and flow conditions was accomplished in approximately three minutes by aligning the standby pump to the emergency cooling pond. Cleaning of debris from the pump discharge strainers restored both loops to an operable status in approximately two hours. The requirement to perform procedures in the proper sequence, unless specifically authorized otherwise, has been emphasized to appropriate maintenance personnel. Other corrective actions involve training of personnel concerning procedural compliance and effective communications.

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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 in startup conditions (Mode 2) with Reactor Coolant System (RCS) [AB] temperature at 545 degrees, pressure 2250 psia and power 8E-2. The traveling screen system for the Service Water System (SW) [BI] was tagged out for maintenance activities.

B. Event Description

On April 16, 1991 both SW loops were declared inoperable for approximately three minutes due to a breakdown in the implementation of procedural controls which resulted in a preventive maintenance (PM) procedure being worked with sections out of sequence. This resulted in debris bypassing SW pump suction screens and clogging the pump discharge strainers.

The SW system provides cooling for equipment essential to ensure safe operation and shutdown of the plant. During normal operation, the water supply is obtained from the Dardanelle Reservoir. An alternate supply for the system is available from the Emergency Cooling Pond (ECP). The system consists of two independent flow paths (Loop I and Loop II) which furnish water to Engineered Safety Features (ESF) equipment, a flow path to the non-safety-related Auxiliary Cooling Water system [KG], and Component Cooling Water (CCW) [CC] heat exchangers. (CCW removes heat from components in various reactor auxiliary systems which carry radioactive or potentially radioactive fluids.) During normal operation one pump supplies Loop I, another pump supplies Loop II, and a third pump (which can be aligned to either operating loop) serves as a standby. Before water from the Dardanelle Reservoir reaches the pump suctions it passes through bar grates and traveling water screens. A basket strainer is installed in the discharge line of each pump.

Mechanical maintenance personnel were performing quarterly preventive maintenance on one of the traveling water screens at the SW intake. In order to obtain access to a part of the screen for inspection and lubrication, maintenance personnel requested that operations personnel remove hold cards from the traveling screen motor. The hold cards were being controlled and outage work was being coordinated by a shift supervisor from the Control Room extension. The shift supervisor authorized the auxiliary operator (non-licensed) to remove the hold card from the traveling screen motor. This hold card removal allowed maintenance personnel to rotate the screen without the normal cleaning spray (wash) being in operation.

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

When the maintenance personnel started screen rotation, they recognized that debris was traveling up the screen, stopped screen rotation, and contacted the Control Room extension. The message was relayed to licensed operators in the extension via a shift administrative assistant. Communication of the message from maintenance personnel was either not clear or was misunderstood. Permission was granted to continue screen rotation. Rotation of the screen without screen wash in service allowed debris to reach the SW pump suctions and begin to clog the discharge strainers. At approximately 1625 hours a high differential pressure alarm was received in the Control Room from the Loop I pump discharge strainer. Approximately two minutes later the high differential pressure alarm was received from the Loop II pump discharge strainer. Control Room operators noted a decrease in discharge pressure of the operating SW pumps. The high differential pressure condition of both operating SW pump discharge strainers resulted in both loops being declared inoperable.

C. Root Cause

The root cause of this event is a breakdown in the implementation of procedural controls which allowed PMs to be worked with sections out of sequence. This resulted in debris bypassing SW pump suction screens and clogging the pump discharge strainers. The procedure being used for the maintenance activity was written with the assumption that each section would be performed in the sequence specified. If this had been done, the screen wash flow would have been established prior to rotating the screen and debris would have been prevented from reaching the pump suctions. Personnel performing the activity believed that it was an acceptable practice to work PM procedures with sections arranged at the discretion of the performer as long as steps within each section were followed in the indicated order. The re-arrangement of sections was believed to be acceptable for more efficient performance of the activity. A contributing factor to this event was ineffective communication between operations and maintenance personnel concerning debris carry-over. Other procedural controls were reviewed and determined to contain adequate instructions concerning procedure implementation.

D. Corrective Actions

The Control Room licensed operator aligned the standby pump to the ECP and restored normal pressure and flow to Loop I at approximately 1630 hours. The normal Loop I pump strainer was cleaned and the pump was started to supply Loop I from the ECP at approximately 1752 hours. The standby pump was shifted to supply Loop II from the ECP to restore both loops to normal pressure and flow at 1813 hours.

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Other corrective actions include:

1. A caution card was installed on each traveling screen jog button and a hold card was installed on the traveling screen motor breaker to prevent screen operation without shift supervisor approval. This is a temporary measure until follow-up training has been completed.

2. Training of operations personnel was performed stressing the importance of not operating SW traveling screens without wash flow via the Operations Night Orders. The Operations Manager is also providing additional training to all operations personnel during the current requalification training cycle regarding this event and emphasizing the importance of proper communication. This follow-up training is expected to be completed by May 31, 1991.

3. Unit 2 maintenance personnel were informed via a memorandum that PM procedures must be followed in the written sequence unless exceptions are specified in the procedure. Specific training concerning this event has been provided to first line supervisors by the Unit 2 Maintenance Manager. The Unit 2 Maintenance Manager is also meeting with each individual crew to provide additional training concerning effective communication between maintenance and operations, as well as PM procedure compliance. This crew training is expected to be complete by May 31, 1991.

4. The SW intake design has been evaluated against those from a selection of other nuclear power plants. The ANO-2 design was found to be similar with respect to separation of intake bays, interlocks and maintenance procedures. The SW system has also been reviewed to determine if other changes to equipment or procedures are necessary to minimize the possibility for introducing debris into the system. The results of this review are being finalized and documented. Completion of this effort is anticipated by May 31, 1991.

5. Evaluation of the event revealed that it could be applicable to Unit 1. The Unit 1 Maintenance Manager provided training to maintenance personnel via a memorandum describing the event and issuing guidance concerning PM performance standards.

6. Subsequent to this event, additional guidance was issued to all site personnel regarding who is authorized to operate plant equipment.

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

E. Safety Significance

Both SW loops were declared inoperable for approximately three minutes while the standby pump was being placed into service. Throughout the event cooling water was being supplied to both loops, but at a reduced capacity. The safety significance of this event was reduced by several factors such as reduced lake water temperature, low reactor power level, and the reduced decay heat load present after a refueling outage. However, consequences of the results of the reduced cooling capability could have been more significant if initial SW inlet temperature were higher (as is the case during the hotter summer months) or if operation of ESF equipment had been required.

F. Basis For Reportability

Technical Specification 3.7.3.1 provides an action requirement for having only one SW loop operable but does not provide an action if both loops are inoperable. Declaration of both SW Loops inoperable resulted in entry into Technical Specification 3.0.3. Having been in a condition with both SW loops inoperable is an operation prohibited by Technical Specifications and is therefore reportable pursuant to 10CFR50.73(a)(2)(i)(B).

Two independent trains of SW having been declared inoperable due to a single cause or event (debris bypassing the traveling screens) is a condition reportable pursuant to 10CFR50.73(a)(2)(vii).

G. Additional Information

There have been no previous events of this nature reported as Licensee Event Reports at ANO.

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