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January 17, 1991

1CAN019110

U. S. Nuclear Regulatory Commission
Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

SUBJECT: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
License Event Report 50-313/90-022-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(iv), attached is the subject report concerning a reactor trip during plant heatup due to personnel error while shifting reactor coolant pumps.

Very truly yours,

for James J. Fisicaro
Manager, Licensing

JJF/RHS/mmg
Attachment
cc: Regional Administrator
Region IV
U. S. Nuclear Regulatory Commission
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Arlington, TX 76011

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NRC Form 366 U.S. Nuclear Regulatory Commission
(6-89)

Approved OMB No. 3150-0104
Expires: 4/30/92

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4) Reactor Trip During Plant Heatup Due to Personnel Error While Shifting Reactor Coolant Pumps

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 5 0 0 0
1 2	1 8	9 0	9 0	-- 0 2 2	-- 0 0	0 1	1 7	9 1		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)	N	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
0 0 0		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)	50.73(a)(2)(vii)	Other (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	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 (Area Code)
Richard H. Scheide, Nuclear Safety and Licensing Specialist	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

SUPPLEMENTAL 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 December 18, 1990, while conducting a plant heatup in preparation for startup, an automatic reactor trip was initiated by the Reactor Protection System (RPS) upon sensing no reactor coolant pumps (RCPs) running in the "B" Reactor Coolant System (RCS) loop. At the time of the trip, RCPs P-32C and P-32D were running in RCS loop 'A' and P-32A was running in loop 'B'. RCPs were being balanced to reduce vibration in accordance with an approved procedure. The operators were requested to shift from P-32A to P-32B in RCS loop 'B'. After reviewing the RCP operating procedure, the involved operators asked the Shift Supervisor (SS) if he wished to stop P-32A and start P-32B. The SS gave an affirmative response. At that time, a trainee under the supervision of a senior reactor operator, stopped P-32A. A reactor trip then occurred due to zero pumps running in the 'B' RCS loop. The root cause of this event was personnel error. An inadequate procedure was a contributing factor. The RCP operating procedure contained no cautions regarding the possibility of initiating trips when stopping RCPs. A crew briefing was held with the crew involved to discuss this event and its significance. The RCP operating procedure will be revised to include additional guidance regarding shifting RCPs.

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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 One (ANO-1) was subcritical and in the process of performing a plant heatup in preparation for startup following refueling outage 1R9. Reactor Coolant System (RCS) [AB] temperature was approximately 510 degrees and RCS pressure was 2150 psig. The Group 1 control rods were withdrawn to their upper limits to establish "cocked rod" protection during heatup.

B. Event Description

On December 18, 1990, at approximately 1615, an automatic reactor trip was initiated by the Reactor Protection System (RPS) [JC] upon sensing no reactor coolant pumps (RCPs) running in the 'B' RCS loop.

The RPS is a four channel system receiving redundant inputs from nuclear and non-nuclear instrumentation. A channel is "tripped" when any one of the variables it monitors exceeds the channel trip setpoint for that parameter. A reactor trip is initiated when any two of the four channels are tripped.

This event involved the reactor power/reactor coolant pumps trip function of the RPS. The RCP breakers are monitored to determine the operating status of the RCPs. The opening of a RCP breaker initiates four independent signals, one to each protective channel. This signal is received by a pump monitor logic, which counts the number of RCPs in service and identifies the coolant loop in which the pumps are operating. The pump monitor logic output controls the trip point of a power/pump comparitor and initiates a channel trip if the number of pumps is less than that required. A reactor trip is initiated regardless of power level, when the RPS senses no pumps running in a RCS loop.

At the time of this event, ANO-1 operators were conducting a plant heatup in accordance with plant procedures. Three of the four RCPs were operating. RCPs P-32C and D were operating in RCS loop 'A' and P-32A was operating in loop 'B'. Procedure 1402.196, "Balancing For Reduced Vibration P-32A, B, C, D" was in progress and being coordinated by Maintenance Engineering personnel. It was requested that the operators shift from P-32A to P-32B in RCS loop 'B'. Due to the on shift operators involvement with heatup evolutions, the previous shift Senior Reactor Operator (SRO) was requested to perform the pump shift. This SRO and a Reactor Operator (RO) trainee reviewed the "Reactor Coolant Pump Operation" procedure in preparation for shifting pumps. The Shift Supervisor (SS) was then asked if he wanted to stop P-32A and then start P-32B. The SS gave an affirmative response. The SRO then made a page announcement regarding the pump shift and directed the RO trainee to stop P-32A and start P-32B. When P-32A was stopped, a reactor trip was initiated since there were no RCPs running in the 'B' RCS loop. Group 1 control rods inserted into the core as designed. At approximately 1618, P-32B was started reestablishing flow in RCS loop 'B'.

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

C. Root Cause

The root cause of this event was determined to be a cognitive error on the part of the operators involved in shifting the RCPs. None of the operators involved in the pump shifting evolution recognized the fact that stopping P-32A before starting P-32B would initiate a reactor trip. If a more in-depth crew briefing had been conducted prior to shifting the RCPs, this event might have been prevented.

The fact that the 'Reactor Coolant Pump Operation' procedure contains no notes or cautions regarding the possibility of initiating a reactor trip during pump shifting evolutions is considered to be a contributing factor to this event.

D. Corrective Action

Since the reactor was not critical at the time of the trip, no immediate corrective actions were necessary.

At 1830 on December 18, 1990, a briefing was held with the crew involved in the event to discuss the reactor trip, the cause of the trip and its significance.

At 1854, the reactor trip was reset and at 1917, the Group 1 control rods were withdrawn to establish 'cocked rod' protection and heatup was continued.

Long term corrective actions to aid in preventing the recurrence of similar events include revising the "Reactor Coolant Pump Operation" procedure to provide additional guidance regarding the possibility of initiating safety system actuations when changing RCP configurations. This procedure revision is expected to be completed by April 30, 1991.

A review of existing administrative guidance regarding the requirements for crew briefings prior to performing plant evolutions is being conducted to determine if revisions and/or additions to this guidance is necessary. The review and its associated revisions and/or additions is expected to be completed by February 23, 1991.

Training will be conducted for ANO-1 Operations personnel regarding any additions or revisions to the requirements for crew briefings by April 10, 1991.

E. Safety Significance

The reactor was subcritical during this event and the only components actuated were the reactor trip circuit breakers which resulted in the insertion of the Group 1 control rods. The RPS functioned as designed to trip the reactor on a valid actuation signal. There was no safety significance associated with this event.

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

F. Basis For Reportability

This event constituted an automatic actuation of the Reactor Protection System and is reportable pursuant to 10CFR50.73(a)(2)(iv).

This event was also reported in accordance with 10CFR50.72(b)(2)(ii) on December 18, 1990.

G. Additional Information

Previous reactor trips which were caused by Operations personnel error were reported in LERs 50-313/88-018-00, 50-313/89-038-00, 50-313/89-048-00 and 50-368/87-004-00.

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