



Entergy Operations

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May 22, 1992

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U. S. Nuclear Regulatory Commission
Document Control Desk
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Washington, D. C. 20555

SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report 50-368/92-003-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(iv), enclosed is the subject report concerning a subcritical reactor trip.

Very truly yours,

James J. Fisicaro
James J. Fisicaro
Director, Licensing

JJF/TFS/mmg

Enclosure

cc: Regional Administrator
Region IV
U. S. Nuclear Regulatory Commission
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Arlington, TX 76011-8064

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Arkansas Nuclear One, Unit Two

DOCKET NUMBER (2) 050003681
PAGE (3) 1 OF 4

TITLE (4) Corrective Action For Reactor Coolant System Inventory Loss Via Letdown Relief Valve Caused By A Clogged Strainer Results in Subcritical Manual Reactor Trip

EVENT DATE (5)			LER NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
Month	Day	Year	Sequential Number	Revision Number	Month	Day	Year	Facility Names	Docket Number(s)
05	01	92	003	00	05	22	92		050003681

OPERATING MODE (9) 3 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)

POWER LEVEL	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
(10) 000	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
	20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Abstract below and
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	in Text, NRC Form
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	366A)

LICENSEE CONTACT FOR THIS LER (12)

Name	Telephone Number
Thomas F. Scott, Nuclear Safety and Licensing Specialist	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

SUPPLEMENT REPORT EXPECTED (14)

Yes (If yes, complete Expected Submission Date)	No	EXPECTED SUBMISSION DATE (15)	Month	Day	Year
<input checked="" type="checkbox"/>	<input type="checkbox"/>				

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

On May 1, 1992 ANO-2 was in hot standby conditions with dilution of the Reactor Coolant System (RCS) to critical boron concentration in progress when symptoms of excessive RCS leakage occurred. In accordance with the appropriate Abnormal Operating Procedure a manual reactor trip was initiated to insert the Control Element Assemblies that had been withdrawn for trippable negative reactivity protection as part of the normal startup sequence. The source of leakage was found to be from a relief valve in the Chemical and Volume Control System located at the inlet of the letdown purification filters. Corrective actions promptly isolated the letdown system and stopped the leak. Pressure at the relief valve was determined to have reached its setpoint as a result of high differential pressure across a strainer located between the purification ion exchangers and volume control tank. The source of the strainer clogging may be resin or resin fines from the ion exchangers or corrosion particles that passed through the ion exchangers. Corrective actions include determination of the root cause and actions to prevent recurrence for this condition, review of this event with Operations personnel, and improvements in the appropriate annunciator alarm response procedure.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						PAGE (3)
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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 hot standby conditions (Mode 3) with Reactor Coolant System (RCS) [AB] temperature 545 degrees and pressure 2250 psia. Dilution of the RCS to estimated critical boron concentration was in progress. The Chemical and Volume Control System (CVCS) [CB] was in a configuration with two coolant charging pumps running and supplying approximately 88 gpm of demineralized water to the RCS. Letdown was matched to equal that flowrate. Pressurizer level was being maintained at approximately 41 percent, the nominal value for Mode 3 conditions. Shutdown banks A, B, and part-length Control Element Assemblies (CEAs) were fully withdrawn for "cocked rod" (trippable negative reactivity) protection. The annunciator for letdown strainer 2F-28 high differential pressure (DP) was in alarm status.

B. Event Description

At 1921 on May 1, 1992 ANO-2 Control Room Operations personnel observed a mismatch in charging and letdown flowrates and actuation of the boronometer low flow alarm. The operators determined that the Volume Control Tank (VCT) level was decreasing abnormally. The Control Room Supervisor determined that conditions for entry into the "Excess RCS Leakage" Abnormal Operating Procedure (AOP) had been met. The AOP directed opening of the Trip Circuit Breakers (TCBs) which resulted in a manual trip of the withdrawn CEAs at 1924. At 1928 letdown was isolated in accordance with the AOP. This terminated the VCT level decrease indicating that the leak was located in the letdown part of the CVCS and not the RCS. Based on the charging and letdown mismatch over the duration of the event, it was estimated that the leak rate was approximately 30 gpm. Operations personnel were dispatched to the Auxiliary Building [NF] to evaluate potential leakage sources.

It was determined that the source of inventory loss had been through relief valve 2PSV-4800 located on the letdown line at the inlet of the purification filters. The setpoint of this valve is 200 psig. This determination was based upon temperature and radiation levels at the valve tail pipe being higher than normal soon after the leak was identified and returning to normal after letdown was isolated. It was noticed that differential pressure across the letdown strainer (2F-28), located downstream of 2PSV-4800 and between the purification exchangers and the VCT, was reading greater than 30 psid. This condition indicated the pressure at 2PSV-4800 to be high. No other indications or sources of leakage were found. The AOP was exited at 2005.

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

At 2120 letdown flow was restored. At 2125, with one charging pump running and normal letdown flow established, the letdown strainer was blown down. Strainer differential pressure indication decreased from greater than 30 psid to 0.4 psid. An evaluation was performed which confirmed that pressure at 2PSV-4800 reached its setpoint as a result of high letdown strainer differential pressure.

C. Root Cause

The manual reactor trip resulted from the appropriate operator action in compliance with the Abnormal Operating Procedure for excess RCS leakage. The excess leakage was from purification filter inlet relief valve 2PSV-4800. Pressure at 2PSV-4800 reached the lift setpoint as a result of letdown strainer 2F-28 having a high differential pressure. The root cause of the high strainer differential pressure is unknown.

Over the past several months, 2F-28 has been clogging and requiring more frequent blowdowns. While the source of the material clogging the strainer is unknown, it may be either resin or resin fines from the letdown purification ion exchangers or corrosion particles that have passed through the ion exchangers. A normal forward blowdown of the strainer has not usually been successful in reducing the high DP. A backwards flush, forcing material out of the strainer basket, is usually required to reduce the DP to an acceptable level. The periodicity of strainer clogging is irregular. It appears to be clogging after significant changes in letdown flow or changes in ion exchanger alignment. Strainer plugging does not appear to be unique to any particular ion exchanger being in service.

D. Corrective Action

System Engineering will determine the cause for the recurring high differential pressure across the letdown strainer (2F-28) and identify corrective actions prior to September 1, 1992.

The operating crew was aware of the high DP condition on the letdown strainer and had made plans to blow it down. Previous experience had not provided a sense of urgency for this evolution. To ensure that this issue is addressed in the short term, the need to address high letdown strainer DP conditions promptly has been stressed during Unit 2 Operations shift turnovers. A night order summary of this event was initiated and a detailed written description sent to Senior Reactor Operators for use in operating crew discussions. Operations procedure 2203.012L for response to the annunciator alarm for high letdown strainer DP has been revised to incorporate the lessons learned from this event. The lessons learned from this event will be further reviewed with Unit 2 Operations personnel during the normal requalification cycle training. This is expected to be complete by September 1, 1992.

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

E. Safety Significance

There were no significant safety consequences or implications as a result of this event. The reactor was subcritical at the time of the trip. Operator actions were in accordance with the appropriate AOP. All safety parameters functioned as expected during this event.

F. Basis For Reportability

This event constituted a manual actuation of the Reactor Protective System [JC] reportable per 10CFR50.73(a)(2)(iv). The event was reported at 2127 on May 1, 1992 per the provisions of 10CFR50.72(b)(2)(ii).

G. Additional Information

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

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