

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Arkansas Nuclear One, Unit Two DOCKET NUMBER (2) PAGE (3)
1015101010131618110F121

TITLE (4) Reactor Trip on High Steam Generator Level

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)														
01	51	01	7	8	4	8	4	--	0	1	1	--	0	1	0	01	51	01	7	8	4		10151010101

OPERATING MODE (9) 1 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)

POWER LEVEL (10)	01616	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)	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)(f)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ff)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(fff)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)
Name Patrick C. Rogers, Plant Licensing Engineer Telephone Number 51011916141311171
Area Code

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

Cause	System	Component	Manufacturer	Reportable to NRPDS	Cause	System	Component	Manufacturer	Reportable to NRPDS

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

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

On 5/7/84, at 0126 hours during power escalation following a load reduction ordered by the system dispatcher, a reactor-turbine trip occurred due to high level on "B" steam generator. During the power maneuvers, oscillations in feedwater flow occurred with main feedwater control in automatic. In an attempt to avert a unit trip, controls for the main feedwater regulating valves were placed in manual. The unit tripped at 66% full power (FP) during manual feedwater control. No post-trip anomalies or difficulties were noted. Investigation of the control system oscillations revealed that the master controller settings were not at optimum setpoints for maneuvering at reduced power levels. These settings had previously been tuned for optimum automatic control action at 100% power.

NRC Form 366A
(9-83)

Form 1062.11B
U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Arkansas Nuclear One, Unit Two	10151010101 31 61 81	84	1	1	0102 OF 1012

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

On 5/6/84, a load reduction to 55% power was ordered by the dispatcher due to loss of a 500kv transmission line. The transmission line was returned to service and at 0045 on 5/7/84, the system dispatcher requested that the unit be returned to 100%. Power escalation was begun at this time. Oscillations in feedwater flow occurred with main feedwater control in automatic. Steam generator levels were exhibiting divergent oscillations of over 10% from programmed level. With no operator action a reactor trip on either high or low steam generator level was imminent. The decision was made to place the main feedwater regulating valves in manual in an attempt to avert a reactor trip.

For approximately five minutes steam generator levels were stabilized with "A" steam generator at about 63% (previous oscillations ranged 57% to 82%) and "B" steam generator at about 80% (previous oscillations ranged from 58% to 81%). An operator who had limited experience with manipulation of main feedwater control was stationed on "B" steam generator feedwater control and was using the indication from the main feedwater master controller to determine adjustments to the position of the main regulating valve. The operator was also monitoring feed flow/steam flow chart recorders and steam generator level chart recorder as an aid in determining control actions, but to a lesser degree.

Due to feedwater flow adjustments made in response to indications from the feedwater master controller, a steam flow/feed flow mismatch occurred and was noted by the Shift Supervisor. The Shift Supervisor directed the operator to reduce feedwater flow below steam flow. Feed flow was reduced which resulted in even more of a level increase due to the "swell" effect that is characteristic of U-tube steam generators. A reactor trip occurred at 0126 hours on high water level in "B" steam generator. The unit was at 66% FP.

No post trip anomalies or difficulties were noted. The Emergency Feedwater Control System actuated on low steam generator level after the trip. Manual feedwater control was taken to maintain the desired steam generator levels. The error in feedwater control was not cognitive. The operators realized that if the malfunctioning feedwater control system was left in automatic, a plant trip on steam generator level would definitely have occurred. The potential for a trip due to overfeeding or underfeeding in manual was recognized, but manual control was necessary as an attempt to prevent a unit trip.

Investigation of the control system oscillations revealed that the master feedwater controller proportional band was set higher than optimum for reduced power conditions which caused the feedwater system to respond slowly to transient conditions. This action had been taken while at 100% FP after startup from refueling to optimize system response at full power. This change complicated the control difficulty of this system in manual. The proportional band for the master controller was reset after the trip and the proper electronic damping for the the main feedwater flow transmitters was verified. The system was tested and found to respond properly prior to plant restart. I&C Technicians have marked the proper proportional band control settings for both main feedwater controllers in the feedwater control system in an attempt to prevent a similar future occurrence.



ARKANSAS POWER & LIGHT COMPANY

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Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report
No. 84-011-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(iv), attached is the subject report concerning a reactor-turbine trip due to a high level on "B" steam generator.

Very truly yours,

A handwritten signature in cursive script, appearing to read "John R. Marshall".

John R. Marshall
Manager, Licensing

JRM:RJS:ac

Attachment

cc: Mr. Richard P. Denise, Director
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and Engineering Programs
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