



ARKANSAS POWER & LIGHT COMPANY

May 15, 1989

1CAN058905

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
Licensee Event Report No. 50-313/89-015-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i)(B) and (a)(2)(vii), attached is the subject report concerning Reactor Coolant System loop 'B' flow transmitters which were rendered inoperable because the sensing line was not seismically supported.

Very truly yours,

E.C. Ewing / [Signature]

E. C. Ewing
General Manager,
Plant Support

ECE:JDJ:djm
attachment

cc w/att: Regional Administrator
Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

INPO Records Center
1500 Circle 75 Parkway
Atlanta, GA 30339-3064

8905300149 890515
PDR ADDCK 05000313
3 PDC

NRC Form 366
(9-83)U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
Expires: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Arkansas Nuclear One, Unit One										DOCKET NUMBER (2) 051010103113110F013										PAGE (3) 051010103113110F013																																																																			
TITLE (4) Reactor Coolant System Loop 'B' Flow Transmitters Rendered Inoperable Because Sensing Line Was Not Seismically Supported																																																																																							
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)																																																			
1			2			0				9			8			6			8			9				--				0			1			5				--			0			0			5				1			5				8				9														051010103113110F013									
OPERATING MODE (9) N THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																																																																																							
POWER										20.402(b)										20.405(c)										50.73(a)(2)(iv)										73.71(b)																																															
LEVEL										20.405(a)(1)(i)										50.36(c)(1)										50.73(a)(2)(v)										73.71(c)																																															
(10) 01010										20.405(a)(1)(ii)										50.36(c)(2)										X 50.73(a)(2)(vii)										Other (Specify in																																															
										20.405(a)(1)(iii)										X 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																																																																			
Julie D. Jacks, Nuclear Safety and Licensing Specialist																				Area																																																																			
																				Code																																																																			
																				5101191614-1311010																																																																			
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) No																																																																																							
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																																																																																							

On December 9, 1986, during refueling outage 1R7, a technician performing a calibration of Reactor Protection System (RPS) channel 'A' noted that a loop 'B' Reactor Coolant System (RCS) flow transmitter sensing line was not properly supported. Unistrut supports for the line were installed but there were no tubing clips holding the line to the supports. The affected transmitters provide loop 'B' flow signals to the four channels of RPS for development of a flux/imbalance/flow reactor trip signal. Engineering analysis of the as-found condition indicated that the sensing line could have failed during a seismic event. The failure of this line could have resulted in either a loss of all loop 'B' flow indication (break in the line) or failure to detect a change in loop 'B' flow (crimp in the line). A review of past maintenance activities could not conclusively determine when the tubing clips were removed. The safety significance of this event is considered to be minimal since RPS pump monitors would trip the reactor if Reactor Coolant Pumps tripped during a seismic event. The missing tubing clips were installed December 12, 1986. Current modification and maintenance practices should prevent recurrence of this type of event. This condition was determined to be reportable during a recent review of reportability issues related to previously identified plant conditions.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Arkansas Nuclear One, Unit One		Year	Sequential Number	Revision Number	
	0501010313	89--	015--	01	0020F03

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

A. Plant Status

At the time of the discovery of the problem, Arkansas Nuclear One, Unit One (ANO-1) was in refueling shutdown.

B. Event Description

On December 9, 1986, during refueling outage 1R7, Instrumentation and Control technicians were performing a calibration of channel 'A' of the Reactor Protection System (RPS) [JC]. During the calibration, a technician noted that a Reactor Coolant System (RCS) hot leg flow transmitter [AB-F1] sensing line (instrument tubing) located in the Reactor Building was not properly supported. The sensing line should have been clamped to Unistrut supports. The supports were installed, but there were no tubing clips holding the line to the supports. The affected sensing line serves as a common header to the four RCS loop 'B' flow transmitters (PDT-1034, PDT-1035, PDT-1036, and PDT-1037) which provide loop 'B' flow signals to the four RPS channels. A review of past work activities for these transmitters could not conclusively determine when the tubing clips had been removed.

Each RPS channel receives a flow signal from loop 'A' and loop 'B' of the RCS. The RCS flow signals are used by RPS to develop a high power reactor trip setpoint based on RCS flow and reactor power imbalance. This flux/imbalance/flow trip setpoint works in conjunction with the Reactor Coolant Pump (RCP) monitors, which generate an RPS reactor trip signal based on reactor power level and running RCP configuration. These two trip setpoints ensure that the limit for the Departure from Nucleate Boiling Ratio (DNBR) is not exceeded due to a low RCS flow situation by generating a reactor trip signal when reactor power is too high for the existing RCS flow. Both of these trip signals are bypassed when the reactor is shut down.

An engineering operability assessment completed January 12, 1988, concluded that the missing tubing clips created an unsupported length of tubing which could not be shown to be operable; i.e., the sensing line could have failed during a seismic event. Seismic design standard criteria for tubing supports require supports to be spaced every 30 inches, and the four missing clips resulted in an unsupported span of 150 inches.

C. Safety Significance

The failure mode of the RCS loop 'B' flow transmitters during a seismic event is indeterminate. The failure of this line could have resulted in either a loss of all RCS loop 'B' flow indication (break in the line) or failure of the transmitters to detect a change in loop 'B' flow (crimp in the line). In the case of a loss of loop 'B' flow indication caused by a sensing line rupture during a seismic event, the resulting zero flow signal to the RPS would have generated a reactor trip signal. Conversely, a seismic event could have caused the line to crimp such that the flow transmitters could not respond to a change in RCS loop 'B' flow. In this case, the RCP monitors would generate a reactor trip signal if the RCPs tripped. (The pump monitors generate a reactor trip signal if reactor power is greater than 55 percent and any two RCPs trip, or if power is greater than zero percent and two RCPs in one RCS loop trip.) Since protection would be provided from exceeding the DNBR limit in either case, the safety significance of this event is considered to be minimal.

D. Root Cause

The root cause for the missing tubing clips and the length of time the condition had existed could not be ascertained; a review of past maintenance activities could not conclusively determine when the clips were removed.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		Year	Sequential Number	Revision Number	
Arkansas Nuclear One, Unit One	05001013113	89	015	0	0101013

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

E. Basis for Reportability

Technical Specification Table 3.5.1-1 requires a minimum of two operable flux/imbalance/flow instrument channels. If this requirement is not met, the reactor is to be in hot shutdown within 12 hours. Since the flow transmitters should have met seismic design criteria but did not, all four RPS flux/imbalance/flow instrument channels are considered to have been inoperable. Therefore, this condition is reportable in accordance with 10CFR50.73(a)(2)(i)(B), operation in a condition prohibited by Technical Specifications. This event is also considered to be reportable under 10CFR50.73(a)(2)(vii), any event where a single condition caused at least two independent channels to become inoperable in a single system designed to shut down the reactor.

The NRC Operations Center was notified of this event of April 26, 1989, in accordance with 10CFR50.72(b)(2)(i), any event, found while the reactor is shut down, that, had it been found while the reactor was in operation, would have resulted in the nuclear power plant, including its principal safety barriers, being seriously degraded or being in an unanalyzed condition that significantly compromises plant safety. However, further review of the condition determined that plant safety was not significantly compromised as the RPS would still have functioned to protect the reactor during a seismic event.

This event was recently identified as reportable when the reportability of the condition was reevaluated during a review of open action items related to previously identified plant conditions. This review was being conducted as part of a plant improvement program to convert to a new system for identifying and reporting events or conditions and implementing appropriate corrective actions.

F. Corrective Actions

During refueling outage 1R7, when the missing supports were discovered, tubing clips were installed to clamp the sensing line to the Unistrut supports. This work was completed 12/12/86. An engineering inspection of similar components was conducted during 1R7 and revealed no other discrepancies.

The process currently in use at ANO to perform maintenance and to develop and implement plant modifications should prevent the recurrence of this type of event.

G. Additional Information

Similar events in which components were rendered inoperable because seismic supports were not reinstalled after maintenance or modifications have been reported previously in Licensee Event Reports 50-368/87-005-00 and 50-313/88-011-01. These events were determined to have occurred in 1986 and 1980, respectively.

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