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U. S. Nuclear Regulatory Commission
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Subject: Arkansas Nuclear One - Unit - 1
Docket No. 50-313
License No. DPR-51
Licensee Event Report 50-313/2000-005-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i)(B), enclosed is the subject report concerning Reactor Protection System surveillances.

Very truly yours,

Jimmy D. Vandergrift
Director, Nuclear Safety Assurance

JDV/fpv

enclosure

IE22

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Arkansas Nuclear One - Unit 1	05000313	1 of 4

TITLE (4) Deficient Reactor Protection System Surveillance Tests Due To Inadequate Procedure Verification Resulted In Operation Prohibited By Technical Specifications

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 NAME	DOCKET NUMBER
10	18	2000	2000	005	00	11	16	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (Check one or more) (11)					
		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)		
POWER LEVEL (10)	100	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		
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Specify in Abstract Below and in Text		
		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 (Include Area Code)
Fred Van Buskirk, Nuclear Safety and Licensing Specialist	501-858-3155

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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 15 single-spaced typewritten lines) (16)

Deficient monthly surveillances have been performed on the 4 channels of the Reactor Protection System (RPS). The 18 month channel calibration tests were performed in accordance with their schedules with the understanding that the required elements of the monthly tests were encompassed by the calibration tests. Consequently, the monthly tests were not performed during months when the calibration was scheduled. However, it was subsequently discovered that one parameter, required to be tested during the monthly surveillance, was not included in the 18 month calibration test. The affected parameter is the Reactor Coolant System total flow amplifier scaled output voltage. The output signal of this amplifier is used by a function generator to establish the plateau of the Power/Imbalance/Flow curve, which becomes the setpoint for the Power/Imbalance/Flow RPS trip bistable. When it was determined that this omission resulted in deficient surveillances affecting each RPS channel, the applicable steps of the channel monthly tests were performed and test results demonstrated that all channels were operable.

A. Plant Status

At the time of this event, Arkansas Nuclear One (ANO-1) was operating at steady-state conditions at 100 percent power.

B. Event Description

Technical Specifications requirements for Reactor Protection System (RPS) [JC] monthly surveillance testing were not being completely satisfied by performance of the 18 month calibration tests.

RPS channel calibration procedures are performed every 18 months in order to calibrate and functionally test the four ANO-1 RPS channels. It was intended that this surveillance encompass all of the requirements of monthly RPS tests used for verification of proper system response and operation. Accordingly, it has been the practice that when the 18 month calibration was performed, credit was taken for concurrently satisfying the requirements of the monthly channel test. However, on October 18, 2000, while conducting post maintenance testing on RPS channel A, an Instrument and Control Technician discovered that the 18 month channel calibration procedure did not contain steps to verify the Reactor Coolant System (RCS) [AB] total flow amplifier scaled output voltage. This verification is a requirement of the monthly test. Therefore, although credit has been taken for satisfying the monthly test requirements based on satisfactory completion of the 18 month calibration test, one required parameter had been omitted.

The RCS total flow amplifier scaled output voltage is the RCS flow input signal to a Reactor Protection System channel function generator. The function generator receives inputs from the RCS flow and reactor power imbalance. It then develops the Power/Imbalance/Flow (PIF) curve using these inputs and its internal calibration settings. This curve becomes the setpoint for the PIF bistable. The bistable compares reactor power to the PIF curve and generates a channel trip signal if the limits of the curve are exceeded. The plateau of the PIF curve is determined by the flow input voltage. Therefore, the RCS total flow amplifier scaled output is considered a setpoint.

The 18 month calibration procedures should have included steps to test the RCS total flow amplifier scaled output voltage in order to fulfill the requirements of the monthly test. Due to this omission, credit should not have been taken for the monthly test based on the completion of the 18 month calibration. This constituted a deficient monthly surveillance. After the discovery of this condition, applicable steps of the monthly tests for channels B, C, and D of RPS were performed. The applicable steps of the monthly test for channel A had been performed on the previous day in conjunction with post maintenance testing. Test results for the RCS total flow amplifier scaled output voltage were satisfactory. These test results demonstrated that, despite the deficient surveillances, the Reactor Protection System had been operable.

C. Root Cause

A review of the revision history for the affected procedures determined that in 1985 a revision to the 18 month calibration procedure had relocated the steps for testing and adjustment of the RCS total flow amplifier scaled output. These steps were placed in a separate procedure that is performed in conjunction with plant startup from refueling outages. At the time, this was acceptable because the monthly test was performed in addition to the 18 month calibration, thus satisfying all surveillance requirements. However, beginning in August 1996 credit was taken for satisfying monthly test requirements upon completion of the 18 month calibration. The deficiency that resulted was the failure to verify a specific output of the RCS total flow amplifier module in accordance with the monthly surveillance requirement.

The RPS 18 month calibration procedure contains steps for performing a calibration of the RCS total flow amplifier module by applying known inputs to the module and verifying the expected output at a test jack. However, there is a second test jack used for verification of the scaled output voltage during the monthly test that is not included in the calibration procedure. This scaled output is the input signal to a function generator and is used for development of the PIF trip setpoint. Although the difference between the two procedures is subtle, an effective and detailed comparative review should have detected and resolved this discrepancy before credit was taken for performance of the monthly test based on the completion of the 18 month calibration.

The root cause of the deficient surveillances is attributed to ineffective work practices that resulted in an inadequate verification during the comparative review of the two surveillance procedures. This resulted in a failure to detect a condition where performance of the 18 month RPS calibration did not satisfy all the requirements of the RPS monthly test.

D. Corrective Actions

Immediately following the discovery that deficient monthly test surveillances had been performed on the Reactor Protection System, the appropriate steps of the monthly tests were performed for RPS channels B, C, and D. The monthly test had been performed on channel A the previous day in conjunction with post maintenance testing following corrective maintenance. Test results for all four channel surveillances were satisfactory and verified that the Reactor Protection System remained operable.

An immediate comparative review of the RPS monthly test and 18 month calibration procedures was performed to determine if any other test deficiencies existed in the calibration procedures. No other deficiencies were found.

The 18 month channel calibration procedures will be revised prior to their next scheduled use (April 2002), to add the requirement to test the RCS total flow amplifier scaled output voltage.

Training designed to improve verification techniques will be developed and delivered to the Maintenance staff by August 1, 2001.

E. Safety Significance

A review of test and calibration records for all four RPS channels was performed. It was found that credit had been taken for satisfying the requirements of the monthly test based on completion of the 18 month calibration since August 1996. Each time an occurrence was located where credit had been inappropriately taken for a monthly test, a review of the subsequent monthly test was performed. In all cases, the test results for the RCS total flow amplifier were found to be within the operability limits of the monthly test procedure. This condition did not affect the ability of the RPS to perform its required safety function and therefore had no actual safety significance.

F. Basis for Reportability

The omission of the steps for testing the RCS total flow amplifier scaled output voltage from the 18 month calibration test resulted in a deficient surveillance test each time the calibration was performed and credit was taken for the RPS monthly channel test. The resulting deficient monthly tests credited during performance of the 18 month RPS calibrations are therefore considered deficient surveillances. Guidance contained in NUREG-1022, Rev. 1, states that deficient surveillance tests are reportable when the surveillance interval plus the allowed interval extension plus the LCO action statement time is exceeded. This report is therefore submitted in accordance with 10CFR50.73(a)(2)(i)(B) as an operation prohibited by Technical Specifications.

G. Additional Information

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

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