

L I C E N S E E E V E N T R E P O R T (L E R)

FACILITY NAME (1) Arkansas Nuclear One - Unit 2
DOCKET NUMBER (2) PAGE (3)
10151010101 31 61 8110F1013

TITLE (4) Loading of Incorrect Core Protection Calculator (CPC) Addressable Constants

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)
01	12	91	81	01	02	01	01	01	01	01

OPERATING MODE (9) 2 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

POWER LEVEL (10)	20.402(b)	20.405(a)(1)(i)	20.405(c)	50.36(c)(1)	50.73(a)(2)(iv)	73.71(b)
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(v)	50.73(a)(2)(vii)	73.71(c)	
	20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Other (Specify in Abstract below and in Text, NRC Form 366A)		
	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 Patrick Rogers, Special Projects Coordinator
Telephone Number
Area
Code
151011-191641-1311010

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)
[] Yes (If yes, complete Expected Submission Date) [x] No
EXPECTED SUBMISSION DATE (15)
Month Day Year

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

Routine daily surveillance of Core Protection Calculator (CPC) addressable constants identified that addressable constants for Cycle 3 rather than Cycle 4 were in use on January 29, 1984. On the previous day, during low power physics testing an unplanned reactor trip occurred. Routine information collection following a trip requires generation of CPC trip buffer reports. Due to difficulties encountered in collecting this information, the system software was reloaded in the CPC channels. Following this unplanned software reload, the technician loaded type II addressable constants from obsolete disk cartridges. Failing to follow written procedures, the technician did not notify Operations personnel of his decision to reload software. Had Operations been notified, checking of addressable constant values would have occurred immediately as required by procedure. Actual consequences of this occurrence are minimal since the CPCs were bypassed for operation below 10⁻⁴% FP and the automatic bypass removal feature was reset to 1% FP for physics testing. The High Log Power trip channels setpoint of 0.75% FP provided reactor protection in lieu of the CPCs. The event is reported because potential existed for a similar occurrence later when protection by the CPCs is relied upon.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Arkansas Nuclear One - Unit 2	101510101 31 61 81	81 41	-- 0 1 0 2	-- 0 1 0	101210F1013

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

During routine surveillances (daily check) of the Core Protection Calculator System (CPCs), operations personnel observed that the values of addressable constants in the CPCs did not agree with the values expected for Cycle 4. Further investigation revealed that the type II addressable constants for Cycle 3 resided in the CPCs rather than the new Cycle 4 values. This event was discovered at 0905 hours on January 29, 1984. Operations and Nuclear Engineering personnel manually inserted the Beginning of Cycle (BOC) 4 values in all four CPC channels. This was completed by 0030 hours on January 29, 1984. Investigation of this event revealed that the BOC 4 type II addressable constants for all four CPC channels were initially installed manually into the CPC's on January 24, 1984, in preparation for startup and physics testing. Available information obtained from the operations daily addressable constant check indicated that the correct values were in fact installed through January 27, 1984, at 2232 hours.

On January 28, 1984, a CPC reactor trip occurred at 0831. Subsequent to that trip, I&C personnel were requested to obtain trip buffer reports from the CPC channels to aid in determining the cause of the reactor trip signal. It was later determined that there was no specific procedure for obtaining trip buffer reports. The assigned I&C technician encountered difficulty in collecting the trip buffer reports and decided to reload the system software into the CPC channels. Following the unplanned software reload, the technician then loaded type II addressable constants from obsolete disk cartridges. The technician failed to follow written procedures in reloading CPC software which would have required him to notify operations personnel of the software reload and to obtain confirmation that correct addressable constants were installed. It has been AP&L's practice to delay generation of new addressable constant disks for a refueling cycle until after completion of the post refueling tests at 50% FP. Prior to completion of these tests many of the type II addressable constants are predicted from previous cycle values. In the interim period between startup and completion of 50% testing the predicted values of constants are entered manually. A previous event which resulted in incorrect addressable constants was reported in LER 50-368/82-042/01T-0. This event pertained to incorrect alignment of the shape annealing matrix elements by Nuclear Engineering personnel after 50% physics testing.

Safety Significance

During the time period that the Cycle 3 addressable constants were installed in the CPCs, ANO-2 was undergoing low power physics testing at the beginning of Cycle 4. To facilitate testing at low power, the 10⁻⁴% FP CPC trip operational bypass permissive had been set to 1% FP. This allows the CPCs to be manually bypassed at the operator's module up to 1% power to allow certain off normal CEA alignments to be established as required by physics testing procedures. The bypass permissive would be automatically removed above 1%. The HI LOG POWER bypass permissive was also set at 1% power since its setpoint is adjusted when the CPC bypass permissive is adjusted.

The neutron flux signal which provides automatic removal of the CPC bypass permissive at 1% also is utilized to generate a HI LOG POWER trip at 0.75% FP. Consequently reactor protection was being provided by the HI LOG POWER channels of the PPS rather than the CPCs in this event.

Additionally, during physics testing, technical specifications require that the HI LINEAR POWER trip setpoints be <20% above the test plateau. Thus the linear power level would not have been able to exceed 20% power without causing a reactor trip.

During Mode 1 and 2 operation operating procedures require that type II addressable constants are verified to be properly installed in each channel once every 24 hours. Performance of this surveillance caused the error to be detected.

Special test exception 3.10.3 of the Technical Specifications permits bypassing all four channels of the CPCs for physics testing. Specification 2.2.2 requires that changes to type II addressable constants other than as a result of post fuel loading physics testing receive PSC approval prior to implementation. Inadvertent insertion of Cycle 3 values would be a change not as a result of physics testing for Cycle 4, and were not approved for Cycle 4 by the PSC prior to implementation. The differences between the BOC 4 constants, the EOC 3 constants that were inadvertently loaded, and the Cycle 4 constants entered after the completion of 50% physics testing do not appear to be significant. Without detailed analyses exact effects of the misloading can not be determined.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		Year	Number
		Number	Number
TEXT (If more space is required, use additional NRC Form 366A's) (17)			
		0101012--	010101310F1013

This event was determined to be reportable under 10CFR50.73(a)(2)(v) because:

Under different operating circumstances (operation following low power physics testing and prior to preparation of new type II addressable constant disks) the introduction of unapproved addressable constants could have caused a nonconservative calculation of DNBR and/or local power density and delayed reactor trip beyond analyzed values. 50.73 indicates that the event must be reported regardless of the situation or condition that caused the system to be unavailable and even though other systems and controls were available to perform the safety function (reactor trip).

The following actions will be taken to prevent recurrence in the future.

1. New type II addressable constant disks will be generated prior to approach to criticality following refueling.
2. Additional controls on the use of addressable constant disks will be provided and procedures developed/revised accordingly.
3. Special training regarding this event and the additional controls established will be conducted for those I&C, Operations and Nuclear Engineering personnel whose job function requires their cognizance of CPC addressable constants.



ARKANSAS POWER & LIGHT COMPANY

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March 2, 1984

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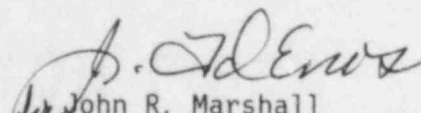
U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report
No. 84-002-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(v), attached is the subject report concerning potentially nonconservative addressable constants loaded into the core protection calculators during low power physics testing.

Very truly yours,


John R. Marshall
Manager, Licensing

JRM:DH:s1

Attachment

cc: Mr. John F. Streeter, Chief
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