NRC Form 366 (9-83)

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U.S. Nuclear Regulatory Commission Approved OMB No. 3150-0104 Expires: 8/31/85

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On 8/29/84, the plant was in Mode 5 and the reactor coolant system (RCS) level was being monitored by a temporary level indicator connected to the bottom of the RCS hot leg and vented to atmosphere. A nitrogen purge of the RCS was in progress to "sweep" hydrogen from the system prior to maintenance. The RCS was being vented via the upper vessel head vent and due to nitrogen flow exceeding vent flow capacity the RCS became slightly pressurized. This resulted in a manometer effect and inaccurate indication of RCS level. The level indication inaccuracy led to resulted in a manometer effect and inaccurate indication of RCS level. The level indication inaccuracy led to draining of the water in the RCS hot leg below the minimum level for adequate shutdown cooling (SDC) pump suction. SDC loop flow indication began oscillating between 2000 gpm and 4000 gpm indicating cavitation of the SDC pump. Consequently the "B" SDC pump and nitrogen purge were secured. Decay heat removal alignment was shifted to the "A" SDC loop and normal flow of ~ 3000 gpm was established. During the period SDC flow was off, RCS bulk average temperature increased from ~ 140° F to ~ 205° F resulting in a change from Mode 5 to Mode 4. To prevent recurrence the temporary level system reference leg has been changed from venting to atmosphere to venting to the pressurizer steam space. Changes have been made to normal and abnormal operating procedures to improve system and operator response to similar events.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	IDOCKET NUMBER (2)	LER NUMBER (6) PAGE (3)
Arkansas Nuclear One, Unit Two		Sequential Revision Year Number Number
TEXT (If more space is required, use additional	NRC Form 366A's) (17	8 8 4 0 2 3 0 0 0 2 0F 0

On 8/29/84, following a reactor trip from 100% full power (FP) that had occurred approximately 36 hours prior to this event, (reference LER 50-368/84-024) the plant was in Mode 5 and the reactor coolant system (RCS) was being drained in preparation for a reactor coolant pump seal replacement. During this operation, a temporary loss of decay heat removal capability via the shutdown cooling (SDC) system occurred due to cavitation and vapor binding and vapor binding was caused by operator actions in response to incorrect RCS level indication.

The RCS was being maintained at approximately 140°F by the "B" SDC pump and heat exchanger. The "A" SDC pump was aligned in normal emergency core cooling system standby with pump suction aligned to the refueling water tank (RWT). The RCS level was being maintained at approximately 2 inches above the RCS hot leg (42 inch inside uiameter), centerline by draining to the boron management system and monitoring a temporary local level indicator. The local level indicator consisted of a tygon tube standpipe connected to the bottom of the RCS hot leg and vented to atmosphere. A nitrogen purge of the RCS was in progress to "sweep" hydrogen from the system performed, a gas sample conister had been placed on the vent line. The vent path flow rate was exceeded by the nitrogen addition rate which slightly pressurized the RCS. This pressurization resulted in a manometer effect (with the tygon tubing being open to atmosphere) and inaccurate indications, the water level in the temporary local level indicator. As a result of the inaccurate RCS level indications, the water level in the RCS hot leg was seeing minor RCS level increases during this evolution due to delayed draining of the steam generator U-tubes.

During the RCS draining, the "B" SDC pump flow indication, monitored in the control room, began oscillating between 2000 gpm and 4000 gpm and the indicated RCS level began oscillating between 2 and 5 inches above the hot leg centerline. At 2055 hours, the "B" SDC pump and nitrogen purge were secured by operations personnel in an approximately 14 inches above the hot leg centerline as the RCS was refilled by gravity flow from the RWT through the "A" SDC pump into the RCS and as the RCS fluid expanded due to heatup. The "B" SDC pump was restarted to decreased to zero approximately 10 minutes later indicating vapor binding and loss of suction. Operations and heat exchanger. The "A" SDC pump was started at approximately 2145 hours and normal flow of approximately 3000 gpm was established.

SDC flow was lost or degraded for approximately 1 hour. During this time period the RCS bulk average temperature increased from approximately 140°F to approximately 205°F resulting in an inadvertent plant operational mode change from Mode 5 to Mode 4. This inadvertent mode change caused entry into Technical Specification 3.0.3. The nighest indicated core exit thermocouple temperature reached approximately 259°F and based on observed system during the temporary loss of SDC. Subsequent testing of the "A" SDC pump revealed no damage or degradation reference leg has been changed from venting to atmosphere to venting to the pressurizer steam space. In addition, the normal and abnormal operating procedures have been modified to enhance operator recognition of such events and to improve response time for restoration of SDC flow.



ARKANSAS POWER & LIGHT COMFANY POST OFFICE BOX 551 LITTLE ROCK, ARKANSAS 72203 (501) 371-4000 October 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. 84-023-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i), attached is the subject report concerning a Reactor Coolant System (RCS) level indication inaccuracy which led to draining of water in the RCS hot leg below the minimum level for adequate shutdown cooling pump suction.

Very truly yours, J. Ted Enos

Manager, Licensing

JTE: RJS: ac

Attachment

cc: Mr. Norman M. Haller, Director Office of Management & Program Analysis U. S. Nuclear Regulatory Commission Washington, DC 20555

> Mr. Richard C. DeYoung Office of Inspection and Enforcement U. S. Nuclear Regulatory Commission Washington, DC 20555