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July 14, 2000

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Operating License DPR-74  
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

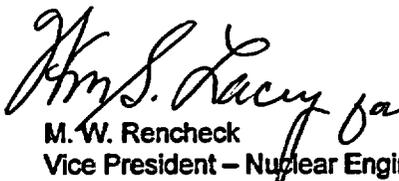
LER 316/2000-005-00, "Auxiliary Feedwater Pump Inoperable Due to Incorrect Flow Retention Valve Settings."

The following commitment was identified in this submittal:

- A reference point for the valve limit switch settings will be included in the Technical Data book for the AFP steam generator supply valves prior to the next intermediate limit switch adjustments.

Should you have any questions regarding this correspondence, please contact Mr. Robert C. Godley, Director, Regulatory Affairs, at 616/465-5901, extension 2698.

Sincerely,

  
M. W. Rencheck  
Vice President - Nuclear Engineering

/srd  
Attachment

c: J. E. Dyer, Region III  
R. C. Godley  
D. Hahn  
W. J. Kropp  
R. P. Powers  
R. Whale  
Records Center, INPO  
NRC Resident Inspector

IE22

# LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 80.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (7-4 P23), 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

FACILITY NAME (1) <b>Donald C. Cook Nuclear Plant Unit 2</b>	DOCKET NUMBER (2) <b>05000-316</b>	PAGE (3) <b>1 of 3</b>
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TITLE (4)  
**Auxiliary Feedwater Pump Inoperable Due to Incorrect Flow Retention Valve Settings**

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	
06	15	2000	2000	- 005 -	00	07	14	2000	FACILITY NAME	DOCKET NUMBER	

OPERATING MODE (9) <b>3</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)										
POWER LEVEL (10) <b>-</b>	20.2201 (b)				20.2203(a)(2)(v)			<input checked="" type="checkbox"/>	50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)				20.2203(a)(3)(i)				50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i)				20.2203(a)(3)(ii)				50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)				20.2203(a)(4)				50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)				50.36(c)(1)				50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)				50.36(c)(2)				50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)											
NAME <b>M. B. Depuydt, Regulatory Affairs</b>								TELEPHONE NUMBER (Include Area Code) <b>616 / 465-5901, x1589</b>			

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).	<input checked="" type="checkbox"/>				NO						

Abstract (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On June 15, 2000, during evaluation of the test data from the surveillance used to verify operability of all three auxiliary feedwater pumps (AFPs), it was determined that the as-left settings for the mid-position limit switches of the turbine driven AFP (TDAFP) steam generator supply valves were not adequate to protect the pump from damage due to run-out flow conditions. Technical Specification (TS) 3.7.1.2, "Auxiliary Feedwater System," allows verification of operability of the TDAFP following entry into Mode 3. The TDAFP had been surveillance tested and was determined to be operable within the 72-hour allowed outage time limit of the TS 3.7.1.2 action statement. Upon further review, it was determined that the valves were set incorrectly, and the TDAFP was again declared inoperable, 88 hours after Unit 2 entered Mode 3. During post-event review, it was conservatively decided that the TDAFP had been inoperable for a total of more than 98 hours, which was greater than the 72 hours allowed by the action statement of TS 3.7.1.2. This LER is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) for a condition prohibited by Technical Specifications.

The apparent cause for this condition was inadequate documentation. Immediate corrective actions were to declare the TDAFP inoperable, verify both motor driven AFPs (MDAFPs) operable, and reset the TDAFP steam generator supply valve intermediate limit switches. The Technical Data book was verified to provide the correct reference points for other valves. A sampling was performed of past limit switch adjustments to verify correct performance. A reference point for the valve limit switch settings will be included in the Technical Data book for all the AFP steam generator supply valves.

At the time of the event, there was negligible decay heat present in Unit 2, well within the heat removal capability of a single MDAFP. The safety significance of the condition of incorrect settings of the TDAFP steam generator supply valve limit switches is therefore minimal.

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

**Conditions Prior to Event**

Unit 2 was in Mode 3, Hot Standby

**Description of Event**

On June 15, 2000, during a detailed evaluation of test data from the surveillance procedure used to verify operability of all three auxiliary feedwater pumps (AFPs), it was determined that the as-left settings for the mid-position limit switches of the turbine driven AFP (TDAFP) steam generator supply valves were not adequate to protect the pump from damage due to run-out flow conditions. These valves automatically travel to an intermediate throttled position to limit AFP flow in the event of a steam line break and rapid depressurization of a steam generator, or upon detection of high flow from the AFP. With the mid-position limit switches adjusted so that the AFP steam generator supply valves would be too far open to reduce pump flow below run-out, the potential existed that the TDAFP could have exceeded its design flow rate had it been required to operate, rendering the pump inoperable. The steam generator supply valves for the two motor driven AFPs (MDAFPs) were also set incorrectly; however, the pumps were still able to perform their design functions, and were therefore operable.

The condition for the TDAFP was identified shortly after Unit 2 transitioned to Operational Mode 3 (Hot Standby) on June 12, 2000, a mode in which the AFPs are required to be operable. Technical Specifications (TS) 3.7.1.2, "Auxiliary Feedwater System," allows verification of operability of the TDAFP following entry into Mode 3. The TDAFP had been surveillance tested and was determined to be operable within the 72-hour allowed outage time limit of the TS 3.7.1.2 action statement. However, upon further review of the data provided by the surveillance test, it was determined that the TDAFP steam generator steam supply valves mid-position limit switches were set incorrectly, and the TDAFP was again declared inoperable on June 15, 2000, 88 hours after Unit 2 entered Mode 3. During the post-event review, it was conservatively decided that the TDAFP had been inoperable for a total of more than 98 hours following entry into Mode 3, which was greater than the 72 hours allowed by action statement (a) of TS 3.7.1.2.

The potential for the TDAFP to have been in a run-out condition had it been needed to mitigate the consequences of an event was determined to be reportable due to exceeding the TS time limit, and this LER is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) for a condition prohibited by TS.

**Cause of Event**

The apparent cause for this condition was inadequate documentation. Specifically, the Technical Data book provided no guidance for the reference point to use when adjusting AFP steam generator supply valve limit switches. The AFP steam generator supply valve mid-position limit switches were adjusted based on direction to use the backseat position of the valve as the reference point. However, information in the Technical Data book was based on setting the limit switches from the closed position of the valve, but that closed position reference point was not included in the Technical Data book, as it should have been. The resultant position of the AFP valves at the intermediate limit switch setting was much further open than required, resulting in abnormally high flow rates through the valves following a flow retention signal.

**Analysis of Event**

The Auxiliary Feedwater System provides water to the steam generators when the main feed pumps are unavailable because of a loss of main feedwater, a feedwater or steam line break, loss of offsite power, or a loss of coolant accident. The system also provides water during startups and shutdowns when insufficient steam is available for the main feed pump turbines. The AFP steam generator supply valves are four-inch motor operated valves (MOVs) that can be throttled to control flow to the steam generators. A flow retention circuit uses signals from flow instrumentation on the discharge of each pump to close the associated pump discharge valves after a preset time delay to an intermediate position upon receipt of a high flow signal from the AFP. In the unlikely event of a feedwater or steam line break, the closing of these valves to an intermediate position assures adequate flow to the intact steam generators without operator action.

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

The limiting scenario for the condition of the AFPs described herein is for any of the events to be initiated from full power, with decay heat loads based on infinite full power operation prior to the event. However, Unit 2 was in Mode 3 following a shutdown period of more than two years, and there was negligible decay heat. Although the TDAFP would not have been available during a feedwater line break in Mode 3 due to net positive suction head requirements, a single MDAFP was capable of meeting the plant's decay heat requirements. An analysis has been performed which demonstrated that the MDAFPs would not have reached run-out conditions due to the incorrect setting of the AFP steam generator supply valve limit switches. Considering a single failure of a MDAFP, one MDAFP would have been available if needed to remove core decay heat. Similarly, the other events for which the Auxiliary Feedwater System is necessary would not have posed a concern with only one MDAFP because these events are also driven by decay heat load, which was negligible for the Mode 3 condition. The safety significance of the condition of incorrect settings of the TDAFP steam generator supply valve limit switches is therefore minimal.

**Corrective Actions**

Immediate corrective actions were to declare the TDAFP inoperable and enter the action statement for TS 3.7.1.2, "Auxiliary Feedwater System." Both MDAFPs were verified to be operable in accordance with TS. The TDAFP steam generator supply valve intermediate limit switches were reset to the correct reference point, and the TDAFP declared operable on June 16, 2000.

An extent of condition review identified eight other valves in the Essential Service Water and the Component Cooling Water systems that reposition in response to an engineered safety feature signal. The Technical Data book provides guidance for the correct reference point from which to set the intermediate limit switches for these eight valves.

A sampling was performed of job orders from past adjustments of the AFP limit switches to determine if this condition had existed in the past without discovery. The sampling identified a number of times when the intermediate limit switches were adjusted for these AFP valves, but each time the adjustment was referenced to the closed position of the valve, which is the correct reference point. Additionally, the post-maintenance test performed for these adjustments used procedure 12-EHP 6040.PER.116, "AFW Flow Retention," which contains appropriate acceptance criteria that would have identified mis-adjustment of the intermediate limit switches.

A reference point for the valve limit switch settings will be included in the Technical Data book for the AFP steam generator supply valves prior to the next intermediate limit switch adjustments.

**Previous Similar Events**

None