NRC Form 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 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 (T-6 F33), 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)	DOCKET NUMBER (2)	PAGE (3)
Cook Nuclear Plant Unit 1	05000-315	1 of 3

TITLE (4)

Postulated High Energy Line Break Could Result in Condition Outside Design Bases for Auxiliary Feedwater

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
11	16	1998	1998	--	058	-- 00	12	16	1998	DC Cook - Unit 2	05000-316
										FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	000		20.2201 (b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
			20.2203(a)(1)		20.2203(a)(3)(i)	X	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	TELEPHONE NUMBER (Include Area Code)
Mr. Joel Gebbie, Safety Related Mechanical Engineering Supervisor	616/465-5901 x1543

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
X	YES (If Yes, complete EXPECTED SUBMISSION DATE).		NO		02	08	1999

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

During a Safety System Functional Inspection (SSFI) self-assessment of the Auxiliary Feedwater (AFW) System, a request was made to review the High Energy Line Break (HELB) analysis for the AFW pump common hallway. The Unit 1 East Motor Driven Auxiliary Feedwater Pump (MDAFP), Unit 1 Turbine Driven Auxiliary Feedwater Pump (TDAFP), Unit 2 East MDAFP, and Unit 2 TDAFP are located adjacent to each other and share a common hallway. A HELB analysis for the hallway could not be located. Evaluation of the potential effects of a HELB on the AFW pumps resulted in the conclusion that this condition could lead to the concurrent failure of the TDAFP and a single MDAFP. On November 16, 1998 this condition was determined to be reportable. Therefore, this LER is being submitted in accordance with 10 CFR 50.73 (a)(2)(ii)(B) as a condition outside the design bases of the plant.

The root cause of this condition was determined to be deficiencies associated with the administration of the HELB program. An independent assessment of the program has been completed, which identified several programmatic deficiencies. These deficiencies are being addressed in the aggregate, and corrective actions to address the programmatic deficiencies will be available in early February 1999. Engineering personnel will perform a HELB analysis of the AFW System and perform necessary actions to restore the system to its design bases.

The safety significance of this condition was evaluated considering the loss of both the TDAFP and a single MDAFP on a HELB in the area. Based on the fact that a single MDAFP can provide sufficient flow in order to safely shut down the plant and one MDAFP would be unaffected by the HELB, it was determined that the condition did not pose a threat to the health or safety of the public.

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

Conditions Prior to Event
Unit 1 was in Mode 5, Cold Shutdown
Unit 2 was in Mode 5, Cold Shutdown

Description of Event
On September 21, 1998, a Safety System Function Inspection (SSFI) self-assessment of the Auxiliary Feedwater (AFW) system began, using SSFI techniques in accordance with NRC Inspection Procedure 93801, "Safety System Functional Inspection". The inspection team utilized a vertical slice review in the functional areas of engineering design and configuration control, operations, maintenance, surveillance and testing, and quality assurance and corrective actions. The self-assessment concluded on October 23, 1998.

During the SSFI, an inquiry was made to review the High Energy Line Break (HELB) analysis for the AFW pump common hallway. No such analysis could be located. On November 16, 1998 it was determined that the potential effects of a HELB in the area was reportable in accordance with 10 CFR 50.73(a)(2)(ii)(B) as a condition outside the design bases of the plant.

The Unit 1 East Motor Driven Auxiliary Feedwater Pump, Unit 1 Turbine Driven Auxiliary Feedwater Pump, Unit 2 East Motor Driven Auxiliary Feedwater Pump, and Unit 2 Turbine Driven Auxiliary Feedwater Pump are located adjacent to each other and share a common hallway. The steam used to drive the TDAFP turbines is provided by 4 inch supply lines, which tap off of the 30 inch Main Steam header. Due to the 4 inch steam supply lines, it is possible for a HELB to occur in either of the TDAFP rooms. To help mitigate the consequences of the postulated break, the doors to the TDAFP rooms are propped open while the doors to the MDAFP rooms are maintained closed. This arrangement allows the steam from the HELB to exhaust into the common hallway shared by the pumps. Investigation has revealed that no analysis could be located which evaluated the effects of the HELB on the equipment in the common hallway. A line break in the area will result in a temperature of 330 °F and a pressure of 14.7 psia, as indicated on plant drawing 1(2)-1355.

Four components were identified which may be rendered inoperable following a HELB. Those four components are:

1. The cable which supplies power to 1-WMO-753, Essential Service Water Supply To The TDAFP -- The qualification report for the cable states that it can operate in an environment of 250 °F, 26.7 psia, and 100% relative humidity. Since the qualified temperature of the cable is less than the calculated temperature of 330 °F, it was assumed to fail.

2. The cable which supplies power to 1-WMO-754, Essential Service Water Supply To The East Motor Driven Auxiliary Feedwater Pump -- The qualification report for the cable states that it can operate in an environment of 250 °F, 26.7 psia, and 100% relative humidity. Since the qualified temperature of the cable is less than the calculated temperature of 330 °F, it was assumed to fail.

3. The cable which supplies power to 2-WMO-753, Essential Service Water Supply To The TDAFP -- The qualification report for the cable states that it can operate in an environment of 250 °F, 26.7 psia, and 100% relative humidity. Since the qualified temperature of the cable is less than the calculated temperature of 330 °F, it was assumed to fail.

4. The cable which supplies power to the solenoid for 2-FRV-258, TDAFP Emergency Leakoff Regulating Valve -- No qualification records could be located for the cable; therefore, it was conservatively assumed that the valve would fail.

The electrical components listed above may not withstand the effects of the harsh steam-air environment. Per Table 14.4.2-1 of the UFSAR, the four components are required for the safe shutdown of the plant. Therefore, it was concluded this condition could lead to the failure the TDAFP and a single MDAFP upon a HELB in the area.

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

Cause of Event

The root cause of this condition is that the HELB program lacks a clearly defined, centralized owner. It was determined that there is no central location for the HELB analyses that have been completed for the plant. The information is fragmented throughout the organization. Also, there is no single authority responsible for the HELB program and much of the HELB program appears to be "tribal knowledge" held by different individuals throughout the organization. In effect, the procedural controls for the HELB program are inadequate.

Analysis of Event

This LER is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B), as a condition outside the design bases of the plant.

The AFW system provides water to the steam generators when main feedwater is unavailable because of a loss of main feedwater, unit trip, feedwater or steam line break, loss of off-site power, or small break Loss of Coolant Accident (SBLOCA). This water removes core residual heat to prevent the release of primary water through the pressurizer safety or power-operated relief valves and allows the plant to cool down to the point at which Residual Heat Removal (RHR) can be placed in service.

Each unit is equipped with one turbine driven AFW pump and two motor driven AFW pumps. For each unit, the TDAFP serves all four steam generators and each MDAFW pump serves two steam generators. The steam to the AFW pump turbine is supplied from two of the steam generators.

The preferred source of water for the AFW system is the non-safety related CST. Each unit's CST is cross-tied by a normally closed air operated valve to provide condensate to the opposite unit's AFW. If both CSTs are unavailable, water is supplied from Lake Michigan via the safety related ESW system, which is connected upstream of the AFW pump suction strainers. A minimum of 175,000 gallons is required to maintain the unit at hot shutdown for nine hours.

A HELB in the area may lead to a concurrent failure of the TDAFP and a single MDAFP. As determined by the Appendix R analyses, a single MDAFP, with a capacity of 450 gpm, can provide adequate cooling in order to safely shut down the unit. The West MDAFP would not be affected by a HELB in the area. Therefore, it was concluded that this condition does not jeopardize health and safety of the public.

Corrective Actions

Engineering personnel will perform a HELB analysis of the AFW system and perform necessary actions to restore the Auxiliary Feedwater System to its design basis. The HELB analysis of AFW will be completed by January 22, 1999. If any plant modifications are required as a result of the analysis, the modifications will be completed prior to restart.

An independent assessment of the HELB program has been performed by an outside consultant. Several programmatic deficiencies were identified during the assessment. These deficiencies are being addressed in the aggregate, and corrective actions to address the programmatic deficiencies will be available in early February 1999.

Previous Similar Events

None