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

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TITLE (4)

"Response to High-High Containment Pressure" Procedure Not Consistent with Analysis of Record

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: DC Cook - Unit 2	DOCKET NUMBER: 05000-316
03	10	98	1998	– 014 –	03	07	22	1999	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
			20.2201 (b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)	00		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 n 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)
Ms. M.B. Depuydt, Compliance Engineer	616/465-5901, x1589

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)

On March 10, 1998, with Units 1 and 2 in Mode 5, it was determined that both units had operated in an unanalyzed condition due to Functional Restoration Procedure FRZ-1, "Response to High-High Containment Pressure", not being consistent with the containment integrity analysis of record. Had the procedure been implemented, the potential existed for post-accident containment pressure to exceed its design basis limit of 12 psig. In accordance with 10CFR50.72(b)(2)(i), an ENS notification was made. This LER is therefore submitted in accordance with 10CFR50.73(a)(2)(ii)(A), for an unanalyzed condition, and 10CFR50.73(a)(2)(ii)(B), for a condition outside the design basis.

The root cause of this condition was inadequate interface with Westinghouse regarding the assumptions used in the safety analysis. The procedure will be revised to direct initiation of RHR spray at the appropriate point to ensure that containment design pressure is not exceeded. A program will be established to identify, document and control key accident analyses assumptions, including those impacting the Emergency Operating Procedures. Additional actions will be taken to strengthen the communications between Operations and Engineering - Safety Analysis, which maintains oversight of vendors performing safety analyses that might impact actions taken by the operators.

Evaluation of this condition has been performed. It has been concluded that containment pressure would have exceeded the design pressure of 12 psig, reaching a calculated peak of 13.85 psig. This value remained below the pre-operational structural integrity test value of 16.1 psig, therefore, it was concluded that the containment would have remained functional.

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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 March 10, 1998, while performing a Containment Spray self assessment, it was determined that the actions directed by Functional Restoration Procedure 1,2-4023.OHP.FRZ-1, "Response to High-High Containment Pressure", were not consistent with the assumptions in the containment integrity analysis of record.

Residual Heat Removal (RHR) (EIIS:BP) spray is designed to supplement the pressure mitigation function of containment spray during either a Loss of Coolant Accident (LOCA) or Main Steam Line Break (MSLB). In accordance with containment integrity analysis input assumptions, FRZ-1 directs that RHR spray be manually initiated when containment pressure reaches 8 psig. The safety analysis did not make allowance for the time delay between containment pressure reaching 8 psig and the delivery of RHR spray to containment. This time delay results from the summation of the time required for the operator to recognize that containment pressure has reached 8 psig; for the RHR spray valves to open and RHR to Reactor Coolant system isolation valves to close/throttle; and for RHR flow to fill the spray line and spray headers. Had the use of this procedure in its current form been required, containment peak pressure mitigation would have been affected.

Cause of Event
This condition was the result of an inadequate interface with Westinghouse regarding the assumptions used in the safety analysis and how they were implemented at the plant. Equipment response times and operator action times were not included by Westinghouse when assumptions regarding RHR spray were incorporated into the analysis.

Analysis of Event
This condition was determined to be reportable in accordance with 10CFR50.73(a)(2)(ii)(A), for an unanalyzed condition that significantly compromises plant safety, and 10CFR50.73(a)(2)(ii)(B) for a condition outside the design basis.

The Emergency Core Cooling System (ECCS) is one of the Engineered Safety Feature systems, which mitigate the consequences of a major breach of the Reactor Coolant system (RCS), or main steam lines inside containment. The RCS line break results in a LOCA, during which the ECCS provides a significant volume of makeup to the RCS as well as core cooling and reactivity control. The LOCA has been determined to be the bounding accident scenario for peak containment pressure.

In response to a LOCA the ECCS operates in two phases. The initial phase, known as the injection phase, starts at the receipt of a safety injection signal resulting in automatic start of the ECCS pumps. The pumps transfer the borated water contained in the Refueling Water Storage Tank (RWST) to the RCS to provide makeup for lost coolant and core cooling/reactivity control. As the RWST is depleted, the ECCS pump suctions are re-aligned to the containment recirculation sump to commence the recirculation phase, which provides long term reactor core and containment cooling.

The ECCS consists of 6 ECCS pumps – 2 high head Centrifugal Charging pumps (EIIS:BQ), 2 medium head Safety Injection pumps (EIIS:BQ), and 2 low head RHR pumps (EIIS:BP) - plus heat exchangers, accumulator tanks, and the associated piping valves and instrumentation.

The RHR pumps start on a safety injection signal and inject borated water from the RWST at a high rate of flow into the RCS when the RCS pressure drops below the shutoff head of the RHR pumps, as in the case of a large break LOCA (LBLOCA).

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The injection phase of the ECCS operation is terminated after the level of the RWST level drops to a pre-determined point. The suction for the RHR pumps and Containment Spray pumps (CTS) is then transferred to the containment recirculation sump. If required, a portion of the RHR flow can be diverted to the upper containment RHR spray headers during the recirculation phase to supplement the containment cooling operation of the CTS. This can be initiated should the containment pressure rise after the initial pressure suppression following a LOCA. Under these conditions, if core temperature is satisfactory, the operator may divert one or both trains of RHR from injection to RHR sprays, thereby supplementing CTS spray flow with an additional 1890 gallons per minute per train.

Evaluation of the identified delay in commencing RHR spray has been performed, considering not only this particular condition, but other conditions which could have an effect on peak containment pressure. The results of this evaluation, using the licensing basis LOTIC code, indicated the peak containment pressure to be 13.85 psig, which is above the current design basis of 12 psig but below its ultimate capability of 36 psig. While 13.85 psig is above the licensing and technical specification basis of 12 psig, it is less than the 16.1 psig that the units were subjected to in their pre-operational structural integrity testing. Therefore, it was concluded that the containment would have remained functional even if it was potentially subjected to pressures as high as 13.85 psig.

Corrective Actions

The containment integrity analysis will be used to determine the appropriate point to initiate RHR spray to ensure that the 12 psig containment design pressure, following a postulated accident, is not exceeded. This task will be completed by August 31, 1999. The Function Restoration Procedure FRZ-1, "Response to High-High Containment Pressure" will be revised to be consistent with the new analysis and will allow time for initiation of RHR spray, repositioning of valves, and filling of RHR spray lines. As Unit 2 will be returned to service first, the Unit 2 procedure will be revised and approved by December 1, 1999, with the procedure for Unit 1 scheduled for revision and approval by January 30, 2000.

To alleviate the interface problem with Westinghouse, a program is being developed and implemented to identify, document and control the key accident analyses assumptions used in the safety analyses, including those that can be impacted by operator action in the EOPs, the key events involving operator action duration that can impact the safety analyses and are part of the EOPs, and the setpoints that will be subject to engineering control that are part of the EOPs. Implementation of the program will be complete by August 31, 1999.

Previous Similar Events

None