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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-009-00:on 911112,ice condenser flow passage insp did not include entire flow area assumed in analyses presented in updated FSAR.Caused by inadequate definition of TS insp requirements.Test procedures revised.W/911212 ltr.

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December 12, 1991

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In accordance with the criteria established by 10 CFR 50.59 entitled Licensee Event Report System, the following report is being submitted:

91-009-00

Sincerely,

A. Alan Blind

A. A. Blind
Plant Manager

AAB:sb

Attachment

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1607

NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WTH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
D. C. COOK PLANT - UNIT 2	0 5 0 0 0 3 1 6	1 OF 0 8

TITLE (4)

INOPERABLE ICE CONDENSER DUE TO INCORRECT FLOW PASSAGE INSPECTIONS

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)
1 1	1 2	9 1	9 1	— 0 0 9	— 0 0	1 2	1 2	9 1	COOK PLANT-UNIT 1	0 5 0 0 0 3 1 5
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		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	TELEPHONE NUMBER
G. A. WEBER - PLANT ENGINEERING SUPERINTENDENT	AREA CODE 6 1 1 6 4 6 5 - 5 9 0 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	

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 fifteen single-space typewritten lines) (16)

An Engineering Evaluation revealed that the Ice Condenser Flow Passage Inspection, to satisfy Ice Condenser Technical Specification Surveillance requirement, did not include the entire flow area assumed in the short term containment integrity analyses presented in the Updated Final Safety Analysis Report (UFSAR). Since the flow area assumed in the containment integrity analysis was not fully inspected, the potential existed for an unacceptable degradation of the flow area.

The deficiency was determined to be reportable on November 12, 1991, and both Unit 1 and 2 Ice Condensers were declared inoperable. The Surveillance Test Procedure was revised to include the new inspection areas. The Ice Condenser Flow Passages in both units were inspected, in accordance with the revised procedure, and found to be operable prior to expiration of the Technical Specification Limiting Condition for operation time limit.

Conditions Prior to Occurrence

Unit 1 was in Mode 1 at 100% Power
Unit 2 was in Mode 1 at 100% Power

Description of Event

An Engineering Evaluation revealed that the Ice Condenser (EIIS/COND) Flow Passage Inspection required to satisfy Technical Specification Surveillance 4.6.5.1.b.3 did not include the entire flow area assumed in the Short Term Containment Integrity analyses presented in Chapter 14.3.4 of the Updated Final Safety Analysis Report (UFSAR) (see attached figure). This deficiency was determined to be reportable on November 12, 1991.

Technical Specification 4.6.5.1.b.3 requires that the Ice Condenser be determined operable at least once per 9 months by performing an inspection of at least two flow passages per Ice Condenser Bay. The purpose of the inspection is to verify that the selected flow passages are not obstructed by accumulations of ice or frost. Ice and frost accumulation is restricted to a nominal thickness of 3/8 inch. If just one of the selected flow passages in a given bay is found to be obstructed with an accumulation of frost or ice greater than 3/8 inch, then an additional sample of twenty flow passages from the same bay must be inspected. If these additional flow passages are found acceptable, the deficiency is considered to be unique and acceptable. More than one restricted flow passage per bay is evidence of abnormal degradation of the ice condenser.

The intent of Technical Specification 4.6.5.1.b.3 is to ensure that the total unobstructed Ice Condenser flow area is greater than the flow area assumed in the Short-term Containment Integrity Analysis. This analysis is presented in Chapter 14.3.4 of the Updated Final Safety Analysis Report (UFSAR). An adequate flow area through the Ice Condenser must be maintained to limit pressurization of the Lower Containment volume in the event of a large Loss of Coolant Accident (LOCA).

The procedure used to perform the surveillance inspections, **12 EHP 4030 STP.250, defined a flow passage as that area enclosed by the diamond-shaped portion of ice basket lattice support structure (see attached figure). On October 10, 1991, the preliminary results of an Engineering Evaluation were announced, which indicated that this definition was incorrect,

Description of Event continued

and that the correct flow passage definition included not only the diamond-shaped area between baskets, but also the area surrounding the basket perimeter.

Since the area adjacent to the perimeter of the Ice Baskets had not been included in previous flow passage inspections, the discrepancy between the surveillance procedure and the evaluation results was entered into the Plant's formal Problem Reporting System. Actions were promptly taken to determine the operability of the Ice Condensers in both units, assuming the more conservative flow passage definition to be correct.

On October 10 and 11, 1991, an operability review of the ice basket flow passages was performed in both Unit 1 and 2. Flow passages were inspected in several Ice Condenser bays in both Unit 1 and 2. The majority of blockage found was along the Containment Wall and Crane Wall which correspond to Rows 1 and 9 respectively. It was conservatively estimated that a maximum of 50 percent of Rows 1 and 9 could be considered blocked. However, no blockage was observed in any of the other rows inspected. Based on the revised flow passage definition, a 50 percent blockage in Rows 1 and 9 flow passages corresponds to a loss of approximately 7 percent of the total Ice Condenser flow passage area. The Engineering Review concluded that the Ice Condenser would meet the operability requirements with the new flow passage area descriptions. This conclusion is based on a previously conducted Safety Evaluation (dated May 30, 1991) which demonstrated that up to 15 percent of the Ice Condenser total flow area could be blocked without exceeding the limits of the Safety Analysis. The Ice Condenser was judged to be operable in both units.

On October 22, 1991, with the revised flow passage definition now verified to be correct, an Engineering Review of the Ice Condenser substantiated the conclusion drawn from the inspections performed on October 10 and 11, 1991. However, it also concluded that continued reliance on the old flow passage definition would not provide adequate assurance that future inspections would be effective in detecting unacceptable degradation of the ice bed. Based on this determination, action was immediately initiated to incorporate the new flow passage definition into the surveillance procedure and to perform the inspection as soon as the revised procedure was approved for use.

Description of Event continued

On November 12, 1991, the Licensing Review of this deficiency was completed. The review concluded that the condition was reportable and that because no surveillance procedure had yet been performed using the new flow passage definition, that the Ice Condensers in both units should be considered inoperable per Technical Specification 3.6.5.1. The Action Statement for this specification requires that the ice bed be restored to Operable status within 48 hours or be in Hot Standby within the next 6 hours and Cold Shutdown within the following 30 hours.

At 1315 hours, upon the receipt of the licensing review, and with the flow passage inspection already in progress in Unit 2, the Ice Condensers in both units were declared Inoperable per Technical Specification 3.6.5.1.

The Unit 2 Ice Condenser Flow Passage Inspections, using the new inspection area, were completed on November 12, 1991, at 1533 hours. The flow passage inspections were acceptable and did not reveal any abnormal ice bed degradation. The Ice Condenser was returned to an Operable status.

The Unit 1 Ice Condenser Flow Passage Inspections, using the new inspection area, were completed on November 13, 1991, at 1128 hours. The Flow Passage Inspections were acceptable and did not reveal any abnormal ice bed degradation. The Ice Condenser was returned to an Operable status.

Cause of Event

This event was caused by the inadequate definition of Technical Specification inspection requirements. The flow passages which are subject to inspection under Technical Specification 4.6.5.1.b.3 are not described in the UFSAR or in supporting documentation provided by the NSSS supplier. The review which finally lead to establishing the correct definition consisted of calculating the total flow area available through the Ice Condenser (i.e., total cross-section minus basket and support frame cross-section) and comparing it to the flow area assumed in the Short Term Containment Integrity Analysis. The agreement of the calculation result with the value used in the analysis made it clear that the correct definition of flow passage included not only the diamond-shaped area between baskets but the area adjacent to each Ice Basket as well.

Analysis of Event

This event is reportable under 10CFR50.72, Paragraph (a)(2)(i)B as an operation or condition prohibited by the Plant's Technical Specifications. This conclusion is based on our determination that previous flow passage inspections failed to consider all the passages that comprise the flow area assumed in the Short-term Containment Integrity Analysis.

This event is not considered to pose an unreviewed safety question, and does not pose a threat to the health and safety of the public. This conclusion is based on the following factors:

1. The flow passage inspections are visual in nature and involve spot checking of several flow passages per Ice Condenser Bay. The inspection results are useful in detecting significant changes or degradation of the Ice Condenser. The previously inspected flow passage areas do represent a significant percentage of the redefined total flow passage area. Therefore, a significant percentage of the previous flow passage inspection should have provided some indication of significant Ice Condenser flow passage degradation.

2. The flow passages previously included in the scope of the inspection surveillance are uniformly distributed throughout the ice condenser between adjacent ice baskets. Since the degree to which a flow passage becomes blocked is influenced by local variations in environmental conditions (temperature, dew point, water leakage, air flow), the degree of blockage indicated by the inspection of a given flow passage is likely to be similar to the degree of blockage of an adjacent uninspected passage. Applying this logic, the acceptable results obtained in past inspections would indicate that the previously uninspected areas were also likely to be in an acceptable condition.

3. Leakage of flake ice from a basket onto the surrounding support frame was evaluated for its potential to cause blockage of previously uninspected flow areas. The amount of blockage in the previously uninspected flow passages is

Analysis of Event Continued

considered minimal since a significant number of ice baskets have been lifted freely during the ice basket weighing program. The fact that these baskets were lifted freely and thus were not bound implies that the adjacent areas have not likely been significantly blocked.

4. The inspections performed on November 12 and 13, 1991, using the revised flow passage definition, concluded that the Ice Condenser flow area was not unacceptably degraded. This result, combined with the opinion of plant personnel involved in Ice Condenser maintenance over a period of many years, that the condition of the Ice Condenser flow passages is not significantly different than that informally observed in past years, provides confidence that the Ice Condenser had not at anytime previously been in a significantly degraded condition.

Previous Cook Nuclear Plant Licensee Event Reports (LERs), numbers 50-316/87-02, 87-10 and 85-13, did report blockage of the Ice Condenser flow passages. These previous LERs concluded that the amount of degradation was not serious, did not pose an unreviewed safety question, and did not pose a threat to the health and safety of the public. However, these conclusions were based on the old flow passage definition and inspection results. The conclusions reported in these previous LERs have been evaluated in light of the new flow passage definition and are considered to be unchanged.

Corrective Actions

The Flow Passage Inspection, Surveillance Test Procedure (12 EHP 4030 STP.250) was revised and Flow Passage Inspections were performed on Unit 2 on November 12, 1991 and on Unit 1 on November 13, 1991. The surveillance findings supported the October 10 and 11, 1991 reviews.

Failed Component Identification

No component failures were identified during this event.

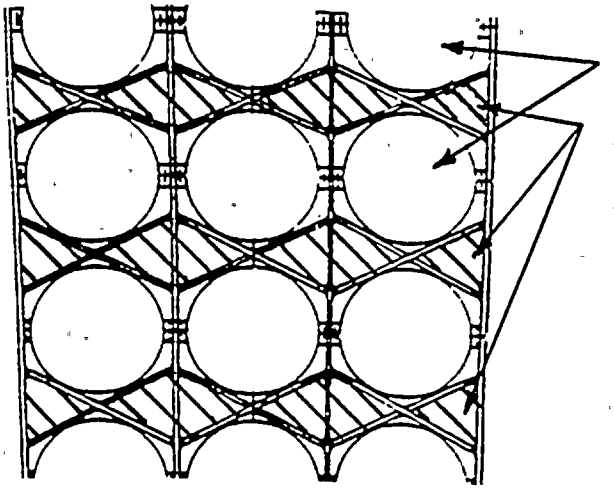
Previous Similar Events

These LERs identified previous Ice Condenser flow passage blockage.

50-316/85-13
50-316/87-02
50-316/87-10

FLOW PASSAGE DESCRIPTIONS
(TOP VIEW OF ICE BASKETS)

Previous Flow Passage Description



Ice Baskets

Previous Flow Passage Description-Consisted of triangular areas between baskets.

New Flow Passage Description

New Flow Passage Description-Includes area along perimeter of basket.