NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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

TITLE (4)

ICE BUILDUP IN ICE CONDENSER FLOW PASSAGES DUE TO SUBLIMATION

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)
										0 5 0 0 0
0 3	0 5	8 7	8 7	— 0 0 2	— 0 0	0 4	0 5	8 7		0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 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)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	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
T. K. Postlewait- Technical Engineering Superintendent	AREA CODE 6 1 6 — 4 6 5 - 5 9 0 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	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)

Between March 5 and 6, 1987, with Unit 2 in Mode 5 (Cold Shutdown), flow passage inspections of the ice condenser revealed frost and ice buildup on the lattice frames of greater than 3/8 inch in eighteen flow passages in two of the twenty-four ice condenser bays. Subsequent investigation indicated that there was also frost and ice formation between the walls and ice baskets adjacent to the walls.

Technical Specification (T/S) 4.6.5.1.b.3 limits frost or ice buildup in flow passages to a nominal thickness of 3/8 inch. According to this T/S, buildup exceeding this limit in two or more flow passages is evidence of abnormal degradation. Though our evaluation has concluded that the degradation is not serious, we believe issuance of this voluntary LER is appropriate since appreciable degradation has been identified.

Actions taken to correct the abnormal degradation included a defrost of the ice condenser and an internal investigation of the event. The internal investigation, aided by Westinghouse, indicated that there were no safety problems, that is, that the ice condenser remained in a configuration in which it would have performed its intended safety functions. Westinghouse Electric Corporation has been asked to perform an evaluation of the effects of this degradation.

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

Conditions Prior to Occurrence

Unit 2 in Mode 5 (Cold Shutdown).

Description of Event

Technical Specification (T/S) 4.6.5.1.b.3 requires that the ice condenser (EIIS/COND) be determined operable at least once per 9 months by verifying, via visual inspection of at least two flow passages per ice condenser bay, that accumulation of frost or ice on flow passages between ice baskets (EIIS/BSKT), past lattice frames (EIIS/FRM), through the intermediate and top deck floor grating, or past the lower inlet plenum support structures (EIIS/SPT) and turning vanes is restricted to a nominal thickness of 3/8 inch. If one flow passage per bay is found to have an accumulation of frost or ice greater than this thickness, a representative sample of twenty additional flow passages from the same bay shall be visually inspected. If these additional flow passages are found acceptable, the surveillance program may proceed considering the single deficiency as unique and acceptable. More than one restricted flow passage per bay is evidence of abnormal degradation of the ice condenser.

The as-found visual inspection conducted on March 5 and 6, 1987, indicated frost and ice accumulation greater than 3/8 inch in two flow passages in Bay 1 and four flow passages in Bay 11. Subsequently, the inspection was expanded to include at least twenty additional flow passages in each bay. This inspection revealed an additional two flow passages in Bay 1 and an additional ten flow passages in Bay 11 with more than 3/8 inch frost and ice buildup. This frost buildup was restricted to the upper lattice frames. (See Attachments 1 - 3).

Subsequent investigations also revealed considerable ice formation in the area between the crane wall and the Row 9 Ice Condenser baskets and between the containment wall and the Row 1 baskets. The ice, which in general is not visible from the upper or lower plenum areas of the ice condenser, has led to certain difficulties, which principally limited our ability to free the required number of wall baskets for weighing. However, a discussion with our NSSS vendor, Westinghouse, has indicated that such ice is not unexpected and is not of significance with respect to public health and safety. Confirmation of this evaluation is expected during the week of April 6, 1987.

The impact of the ice identified in the interstitial lattice work in Bays 1 and 11 has also been evaluated. Again, preliminary conservative evaluation has indicated that this lattice ice formation is not of significance with respect to public health and safety.

During the surveillance interval prior to the March 5, 1987 test several of the 60 air handling untis (AHU) (EIIS/AHU) (used to maintain ice condenser temperature) were intermittently inoperable for maintenance and/or repair. However, it has been concluded that the inoperability of the AHU's did not significantly contribute to the ice sublimation rates experienced.

Cause of Event

It is believed that sublimation of ice or high humidity in the containment air could have contributed to this problem. Further investigation of this event is ongoing.

Analysis of Event

Our evaluation indicates that the total amount of frost and ice buildup was negligible with respect to the flow areas needed to satisfy the analysis of the accident (LOCA) which requires the ice condenser.

Based on the above information and preliminary Westinghouse confirmation, it is concluded that the abnormal degradation event does not constitute an unreviewed safety question as defined in 10 CFR 50.59(a)(2), nor does it adversely impact health and safety.

The vendor's final evaluation is anticipated to be completed during the early part of the week of April 6, 1987. If the conclusions are significantly different from ours and from their preliminary ones, we will notify the NRC.

Though our evaluation has concluded that the degradation is not serious, we believe issuance of this voluntary LER is appropriate since appreciable degradation has been identified.

Corrective Actions

The corrective action was to defrost the ice condenser, including manual scraping of the ice, to remove the accessible frost and ice buildup. Another surveillance was then successfully performed.

We are planning to discuss this situation with other utilities who have ice condenser units. The discussions will center around common problems with ice condenser units and common solutions to these problems.

Failed Component Identification

No component failures were identified during this event.

Previous Similar Events

LER 316/85-013

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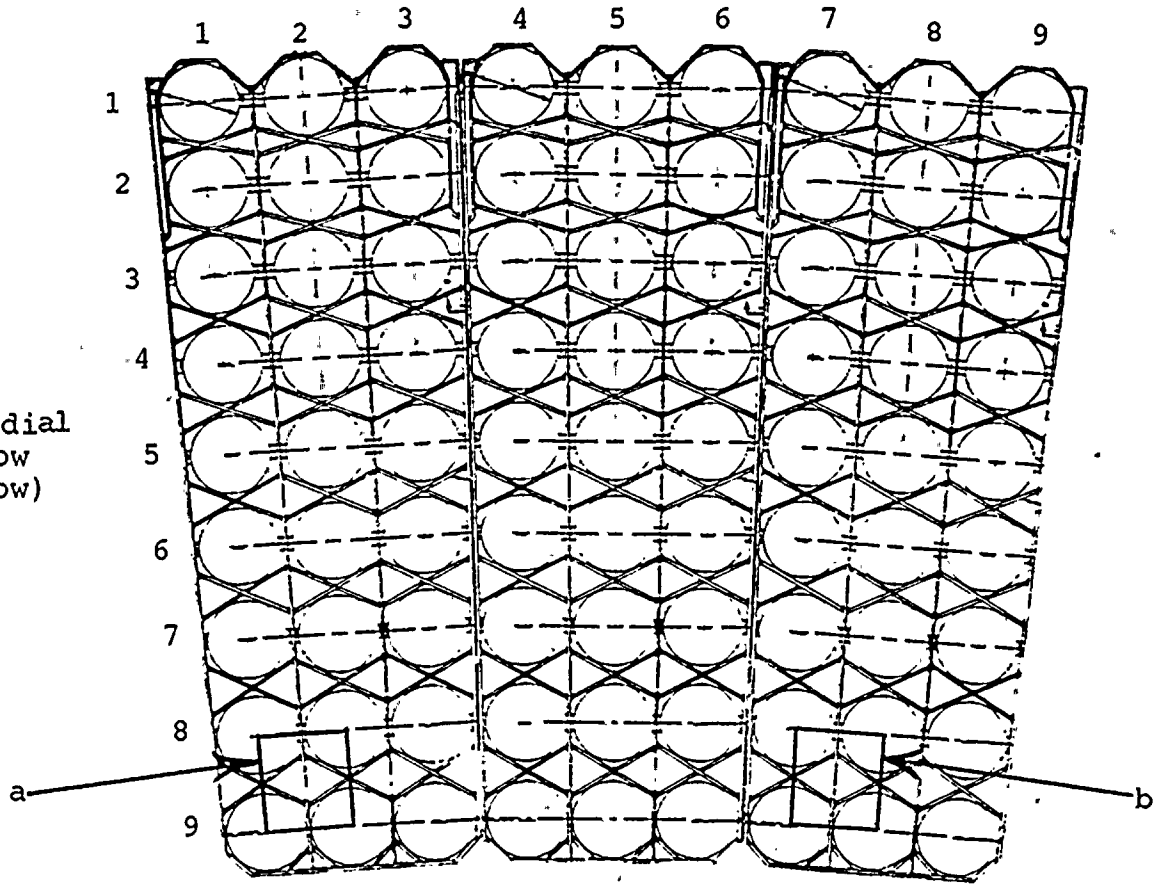
TEXT (If more space is required, use additional NRC Form 366A's) (17)

ATTACHMENT 1

Bay 1 (of 24 total)

Azimuthal Row (Basket)



Description:

The flowpaths indicated by boxed areas a and b had ice buildup of approximately 1/2 inch on top of the framework with a lip of ice over the framework edge approximately 1/2 inch down the framework. This affected framework down to the third cruciform (cruciforms are installed every 6 feet within the 48 foot ice basket).

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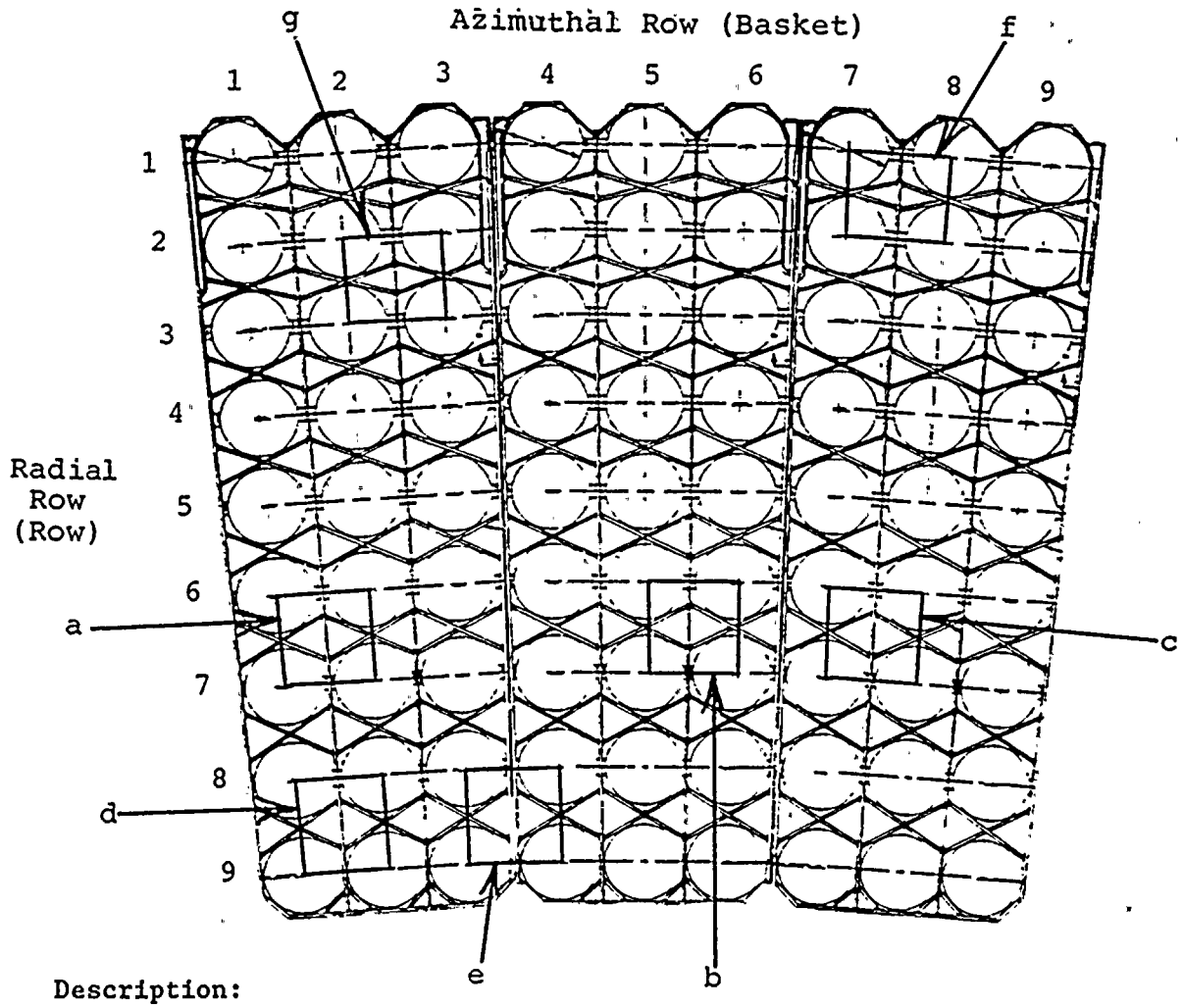
ATTACHMENT 2

Bay 11 (of 24 total)



Description:

The flowpaths indicated by the boxed areas a, b and c had heavy frost buildup of approximately 3/4 inch on the top and sides of the framework. This affected the top framework only.

The flowpaths indicated by the boxed area d had ice buildup of approximately 3/4 inch on top of the framework with a lip of ice over the edge of the framework approximately 3/4 inch thick extending 1/2 inch down the framework. This affected framework down to the third cruciform.

The flowpaths indicated by the boxed areas e, f and g had ice build as described for boxed area d, but only approximately 1/2 inch thick. Areas e and f were affected down to the third cruciform. Area g was affected down to the second cruciform.

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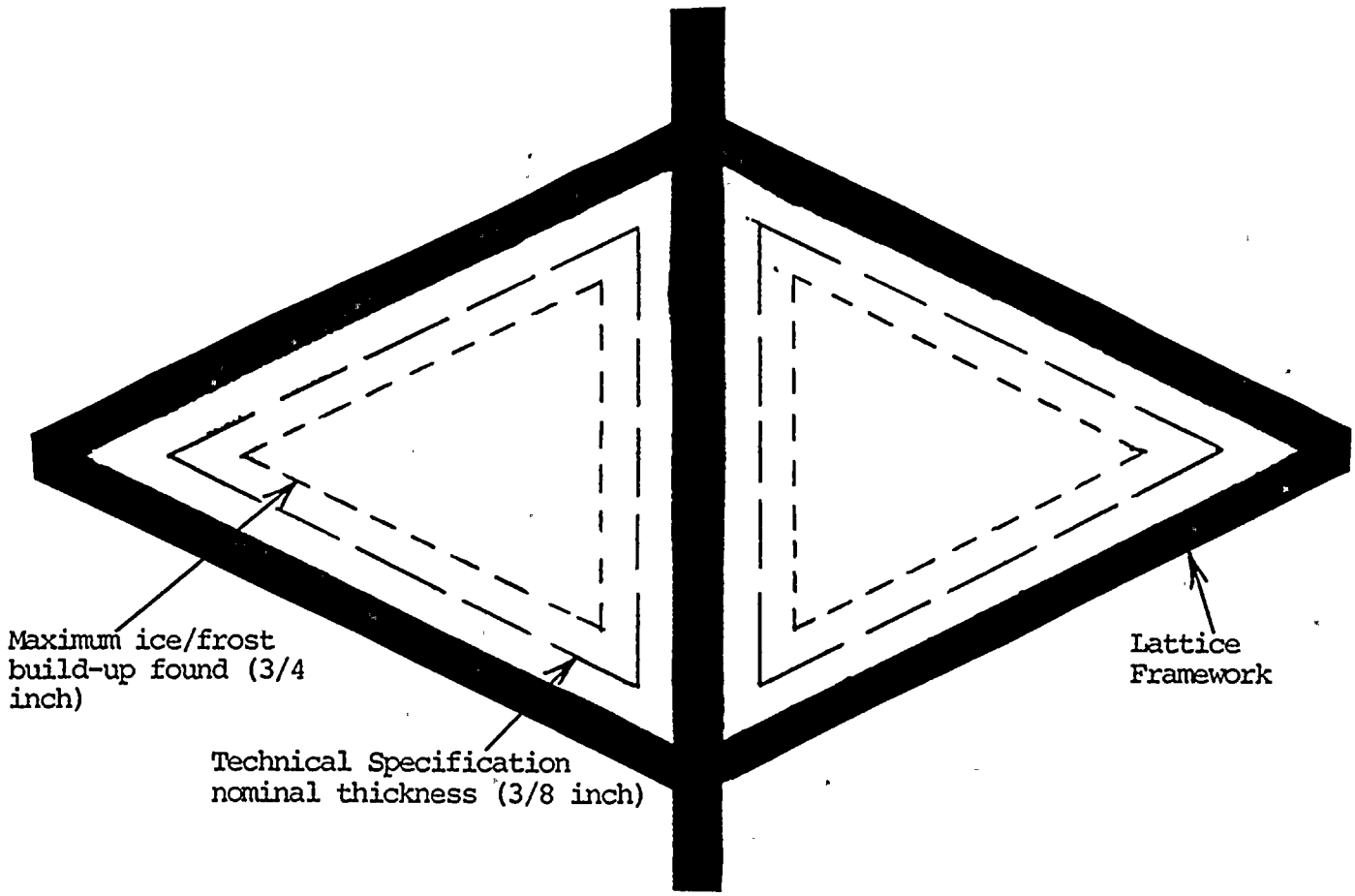
ATTACHMENT 3

Representative Diagram of Ice/Frost Build-up in Two Flow Passages



Scale:

1/2 inch equals 1 inch