

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

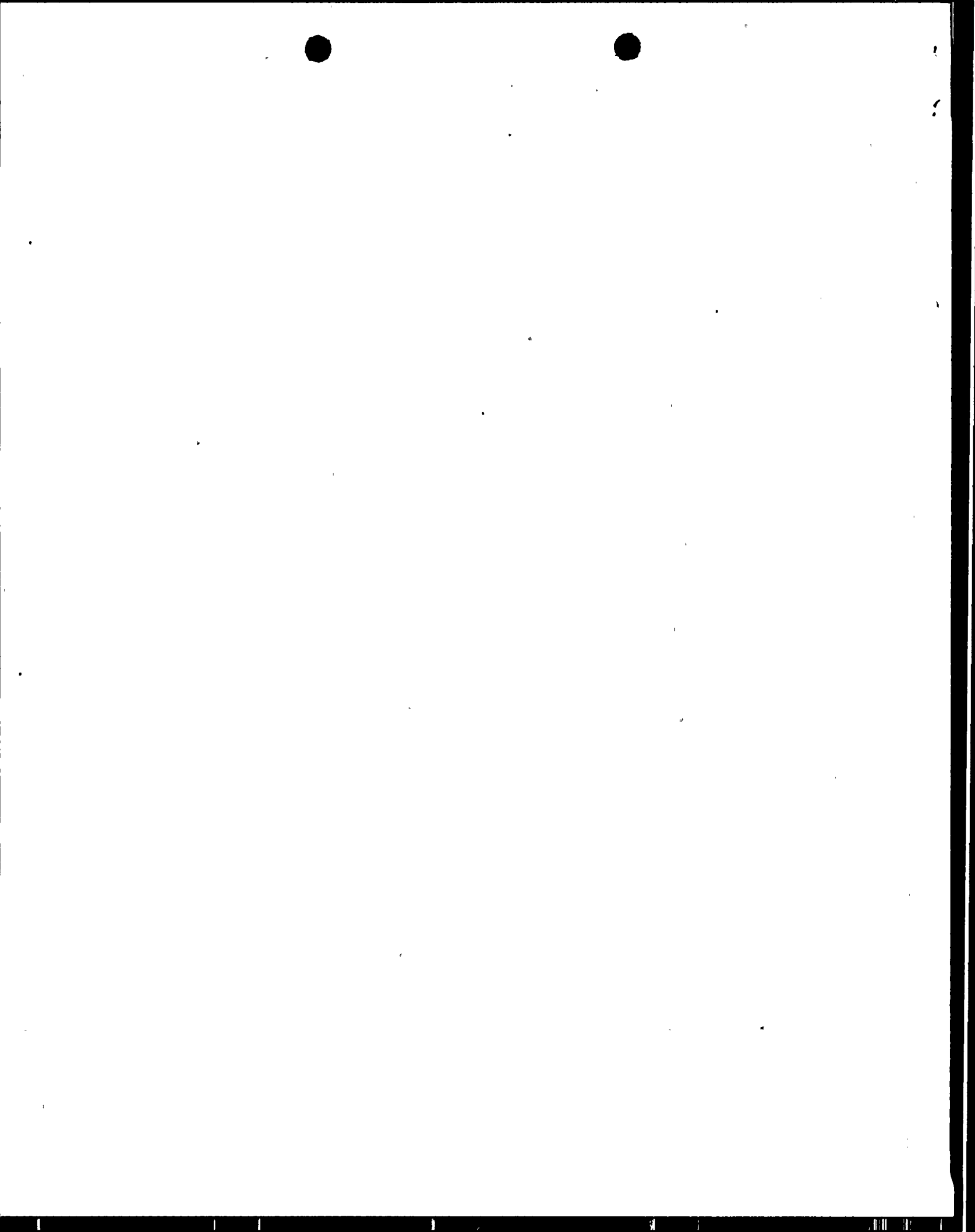
ACCESSION NBR: 8709210529 DOC. DATE: 87/09/14 NOTARIZED: NO DOCKET #
 FACIL: 50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana & 05000315
 AUTH. NAME AUTHOR AFFILIATION
 POSTLEWAIT, T. K. Indiana & Michigan Power Co.
 SMITH, W. G. Indiana & Michigan Power Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-016-00: on 870815, boron injection sys flow
 distribution flow not in compliance w/Tech Spec
 requirements. Caused by normal sys fluctuations. Sys flow
 imbalance reconciled. W/870914 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD3-3 LA	1 1	PD3-3 PD	1 1
	WIGGINGTON, D	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DEST/ADS	1 0
	NRR/DEST/CEB	1 1	NRR/DEST/ELB	1 1
	NRR/DEST/ICSB	1 1	NRR/DEST/MEB	1 1
	NRR/DEST/MTB	1 1	NRR/DEST/PSB	1 1
	NRR/DEST/RSB	1 1	NRR/DEST/SCB	1 1
	NRR/DLPQ/HFB	1 1	NRR/DLPQ/QAB	1 1
	NRR/DOEA/EAB	1 1	NRR/DREP/RAB	1 1
	NRR/DREP/RPB	2 2	NRR/PMAS/ILRB	1 1
	REG FILE 02	1 1	RES DEPY GI	1 1
	RES TELFORD, J	1 1	RES/DE/EIB	1 1
	RGN3 FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1



LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) D. C Cook Nuclear Plant - Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 3 1 5				PAGE (3) 1 OF 0 4								
TITLE (4) ECCS Flow Imbalance Caused by Normal System Fluctuations																						
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	8	15	8	7	0	1	6	0	0	0	9	1	4	8	7	0	5	0	0	0		
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																				
6		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)								
POWER LEVEL (10)		0 0 0 0				20.405(a)(1)(i)				50.73(a)(2)(v)				73.71(c)								
		20.405(a)(1)(ii)				50.36(c)(1)				50.73(a)(2)(vii)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)								
		20.405(a)(1)(iii)				50.36(c)(2)				50.73(a)(2)(viii)(A)												
		20.405(a)(1)(iv)				50.73(a)(2)(i)				50.73(a)(2)(viii)(B)												
		20.405(a)(1)(v)				50.73(a)(2)(ii)				50.73(a)(2)(ix)												
		20.405(a)(1)(vi)				50.73(a)(2)(iii)																
LICENSEE CONTACT FOR THIS LER (12)																						
NAME T. K. Postlewait- Technical Engineering Superintendent										TELEPHONE NUMBER 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 NPDs		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs												
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR								
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO												

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On August 15, 1987, at 1430 hours, with Unit 1 in Mode 6 (Refueling) as-found data obtained while performing routine surveillance on the Boric Acid Injection System, reflected an unacceptable flow distribution as compared to Technical Specification (T/S) 4.5.2h. No cause other than normal system fluctuation, combined with standard instrumentation/measurement error could be identified as the reason the Technical Specification limits could not be met. The system was subsequently balanced on September 3, 1987, in accordance with T/S 4.5.2h. The issue will be integrated into our Technical Specification upgrade program which will assure that it is appropriately considered for a proposed Amendment to the Technical Specifications.

An Engineering Analysis indicates that the Boric Acid Injection System would have functioned as designed during an accident. Adequate cooling was available to cool the core. Cavitation (and the attendant loss of efficiency) which would be expected to occur only during a large break Loss of Coolant Accident, would not be a concern because the primary source of cooling for the large break LOCA is actually the Residual Heat Removal system. It was concluded that this event did not result in a condition that posed a significant safety problem as defined in 10 CFR 50.59.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
D. C. Cook Nuclear Plant - Unit 1	0500031587	—	016	—00	02	OF	04

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

Conditions Prior to Occurrence

Unit 1 in Mode 6 (Refueling)

Description of Event

On August 15, 1987, at 1430 hours while conducting an 18 month surveillance on the flow rates for the Boron Injection (BI) System (EIIS/BQ), it was determined that the system flow distribution was not in compliance with the requirements of Technical Specification (T/S) 4.5.2h. The BI system was found with a total combined flowrate for all loops in excess of the maximum 470 gpm allowable T/S value, and the highest and lowest single loop flowrates varied by more than 10 gpm as allowed by T/S 4.5.2h. The system was subsequently balanced in accordance with T/S criteria by repositioning the associated throttle valves (EIIS/BQ-V) (see ATTACHMENT 1 for as-found/as-left test data) on September 3, 1987.

There were no inoperable components, systems or structures that contributed to this event.

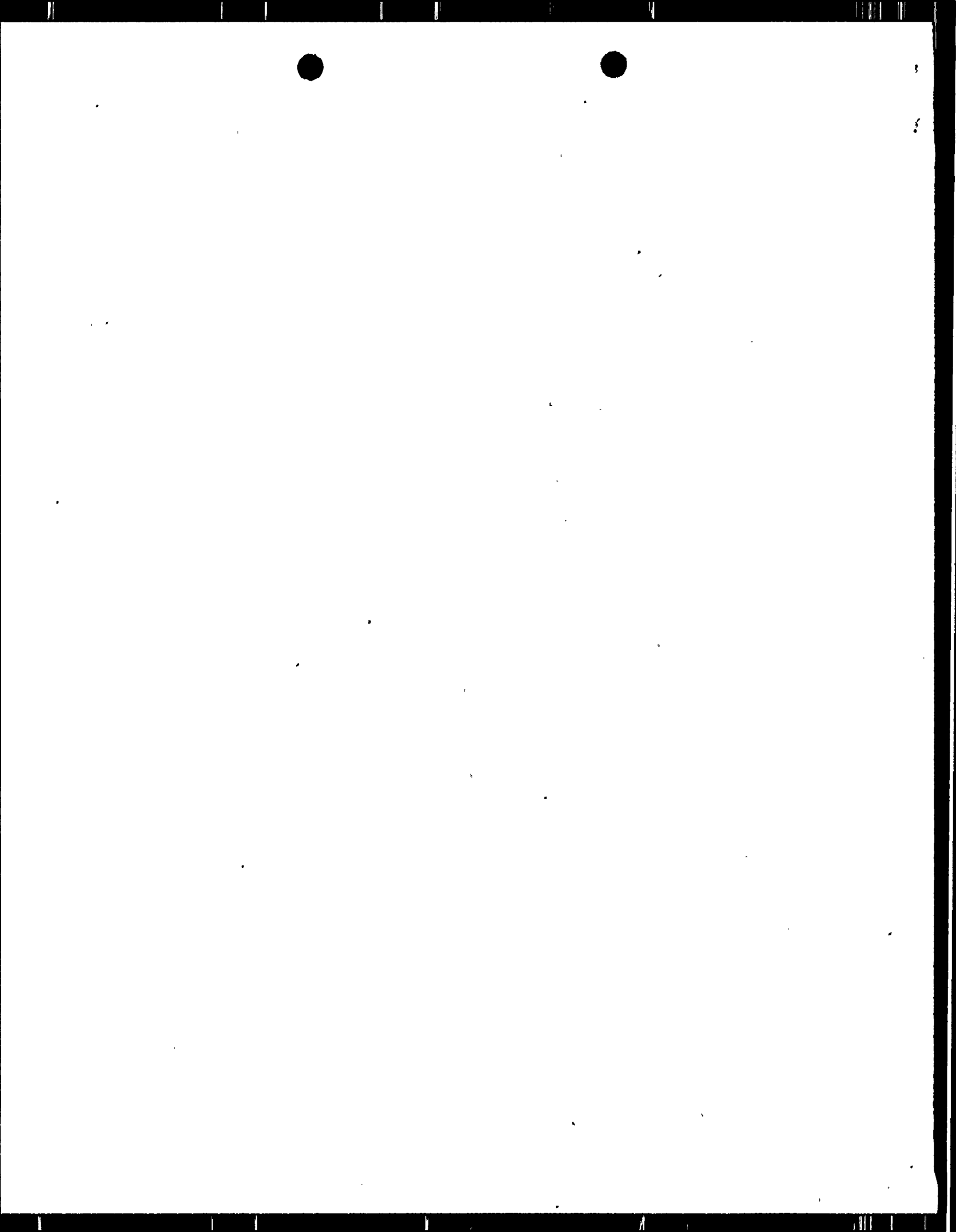
Cause of Event

No cause, other than normal system fluctuations combined with standard instrument/measurement error could be identified. The Technical Specification limits are considered to be very tight and the system fluctuations due to such factors as internal hydraulics and instrument tolerances are felt to be responsible for the small deviations from one surveillance period to another.

Analysis of Event

This event is considered reportable under the provisions of 10 CFR 50.73.a.2.i.B, operation or condition prohibited by T/S.

The flow balancing for the boron injection ensures that adequate flow is delivered to cool the core in the event of a small-break Loss of Coolant Accident (LOCA), that the flow is evenly distributed, and that the flow does not exceed the maximum value for the available Net Positive Suction Head (NPSH), causing pump cavitation.



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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D. C. Cook Nuclear Plant - Unit 1	0 5 0 0 0 3 1 5	8 7	— 0 1 6	— 0 0	0 3	OF	0 4

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

Analysis of Event (cont'd)

As the total flow from the lowest three loops exceeded 345.8 gpm, the "as-found" condition would have provided sufficient flow to cool the core in the event of an accident. Pump cavitation caused by high flow is of concern only when the back-pressure against the centrifugal charging pump (CCP) (EIIS/CB-P) is low, a situation that will occur only during a large-break LOCA. The review indicates that even with cavitation, the pump would be expected to continue functioning with reduced efficiency. However, the Residual Heat Removal (RHR) (EIIS/BP-P) pumps are the primary source of cooling for the large-break LOCA and the cooling contribution from the boron injection system is insignificant.

For a small-break LOCA, the CCP provides flow against a high backpressure and cavitation is not of concern because of the reduced flow and the lower NPSH requirements.

The requirement for a maximum of 10 gpm difference between the highest and the lowest loop was not part of the licensing analysis. Thus, the 16.3 gpm differential is not considered to significantly degrade plant safety, since adequate flow existed.

Based on the above, it is concluded that this event did not result in a condition that posed a significant safety problem as defined in 10 CFR 50.59.

Corrective Actions

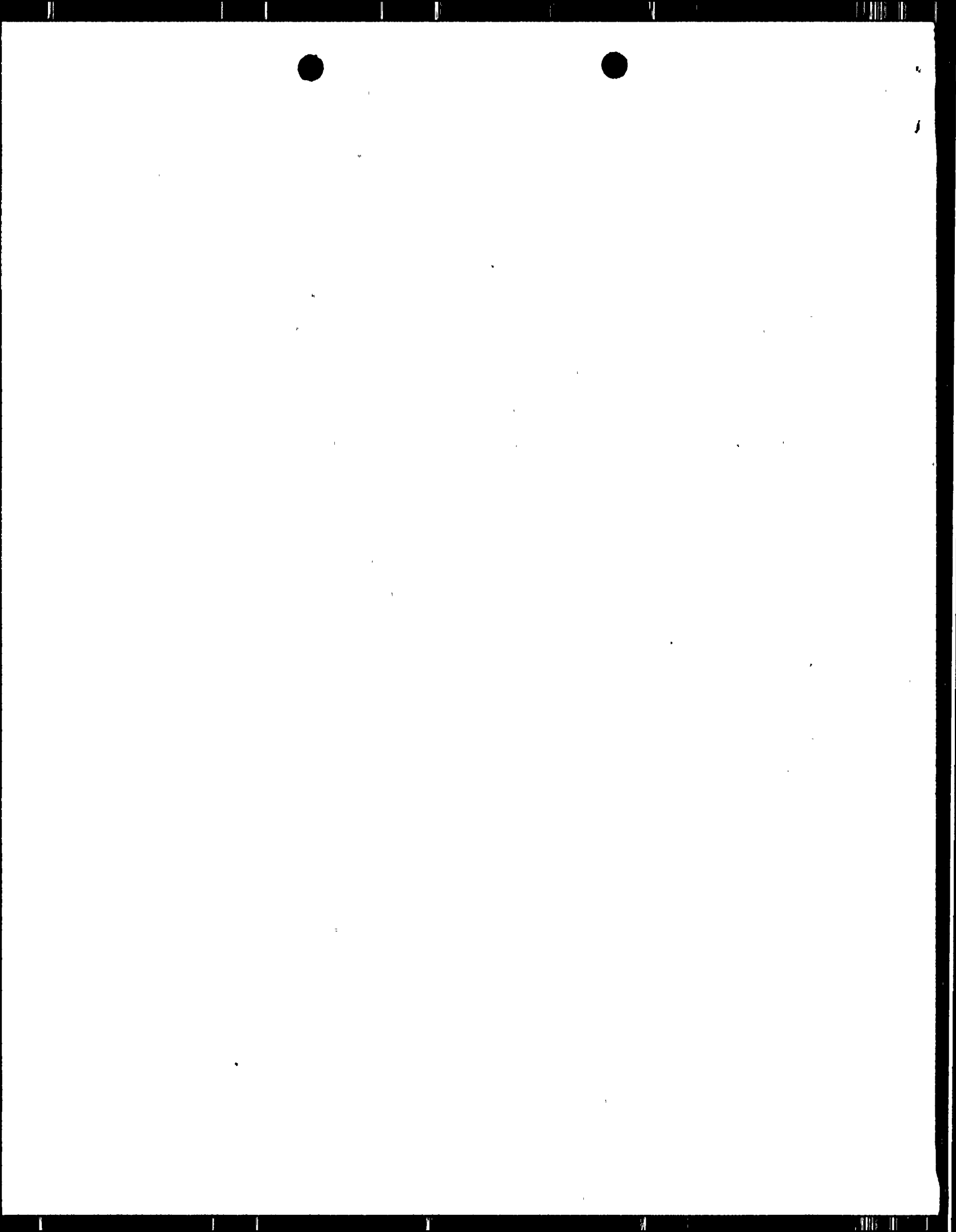
The BI system flow imbalance was reconciled by adjusting the throttle valve positions within each system to achieve an acceptable flow distribution. The issue will be integrated into our Technical Specification upgrade program which will assure that it is appropriately considered for a proposed Amendment to the Technical Specification.

Failed Component Identification

None

Previous Similar Events

50-316/86-012-0
50-315/83-090-0 and
50-315/82-075-0



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

D. C. Cook Nuclear Plant - Unit 1

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

ATTACHMENT 1

Unit 1 BI Flow Balance Data

Data Description	Parameter	Flows (gpm)		Technical Specification 4.5.2h Criteria (gpm)
		East Train	West Train	
As-found	Loop 1	*	124.2	Nominal 117.5
	Loop 2	*	114.6	Nominal 117.5
	Loop 3	*	121.6	Nominal 117.5
	Loop 4	*	130.9	Nominal 117.5
	Δ flow (highest-lowest loop)	*	16.3	≤ 10.0
	Total combined flow (all loops)	*	491.3	≤ 470
	Minimum combined flow (lowest 3 branches)	*	360.4	≥ 345.8
As-Left	Loop 1	117.1	117.1	Nominal 117.5
	Loop 2	117.4	118.6	Nominal 117.5
	Loop 3	116.1	116.5	Nominal 117.5
	Loop 4	117.5	117.6	Nominal 117.5
	Δ flow (highest-lowest loop)	1.4	2.1	≤ 10.0
	Total combined flow (all loops)	468.1	469.8	≤ 470
	Minimum combined flow (lowest 3 branches)	350.6	351.2	≥ 345.8

*) East Train as-found data (not required) was not obtained.

Indiana Michigan
Power Company
Cook Nuclear Plant
P.O. Box 458
Bridgman, MI 49106
616 465 5901



September 14, 1987

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Operating License DPR-58
Docket No. 50-315

Document Control Manager:

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

87-016-00

Sincerely,

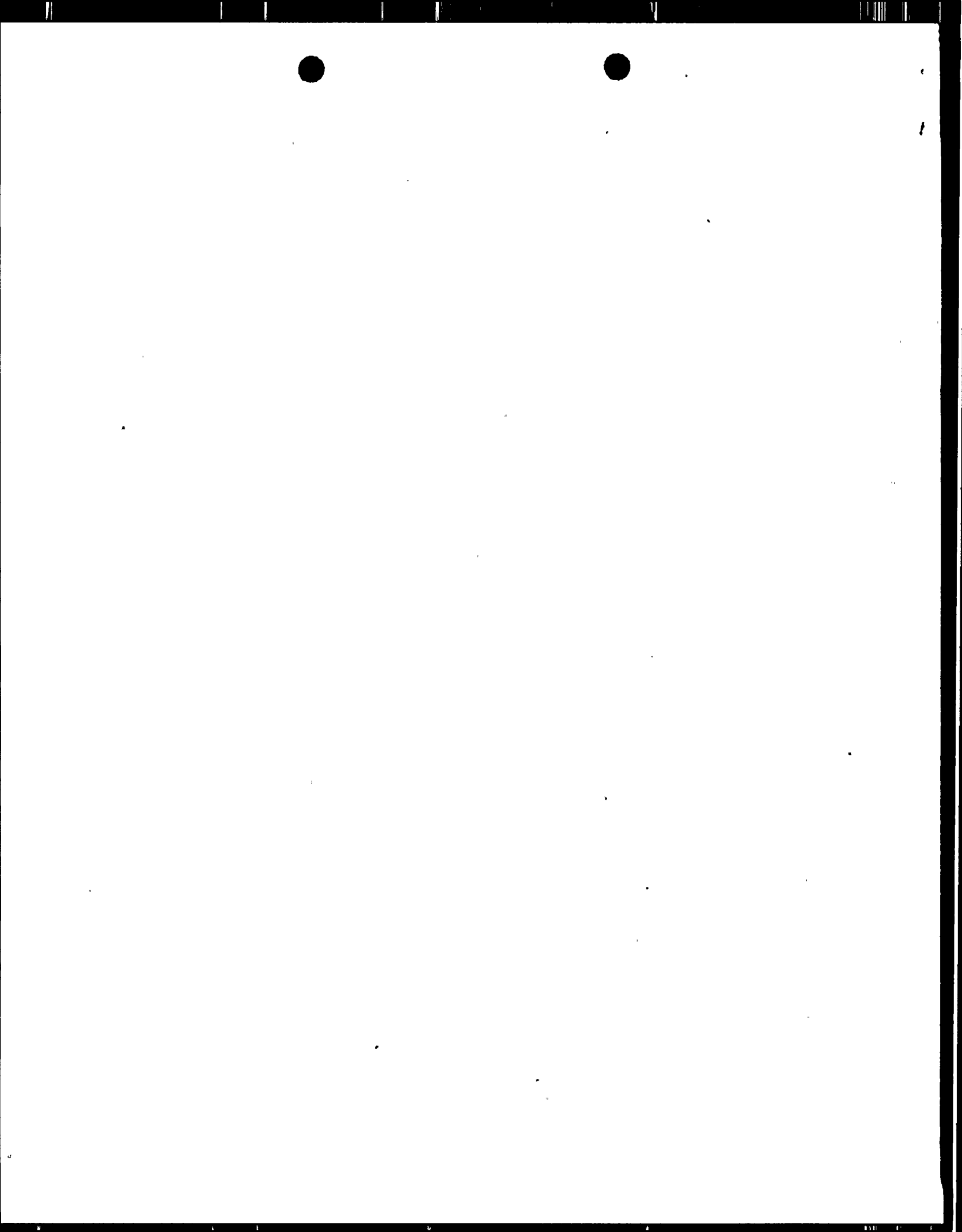
A. Alan Blind for
W. G. Smith, Jr.
Plant Manager

/afh

Attachment

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File

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