

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) DOCKET NUMBER (2) PAGE (3)  
0 5 0 0 0 3 1 1 6 1 OF 0 3

TITLE (4)

DONALD C. COOK UNIT 2

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	1	1	7	8	4	8	4	0	0	1	0	5	0	0	0
0	1	1	7	8	4	8	4	0	0	1	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)									
POWER LEVEL (10)	1 1 0 1 0	20.402(b)		20.406(c)		50.73(a)(2)(iv)		73.71(b)			
		20.406(a)(1)(i)		50.36(e)(1)	X	50.73(a)(2)(v)		73.71(c)			
		20.406(a)(1)(ii)		50.39(e)(2)		50.73(a)(2)(vi)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)			
		20.406(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(vii)(A)					
		20.406(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)					
		20.406(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(ix)					

LICENSEE CONTACT FOR THIS LER (12)  
NAME: DANIEL F. KRAUSE OPERATIONS QCIC  
TELEPHONE NUMBER: 6 1 6 4 6 5 - 5 9 0 1  
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 NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	
A	BIO	1	ITKWL	2	0	N				

SUPPLEMENTAL REPORT EXPECTED (14)  
YES (If yes, complete EXPECTED SUBMISSION DATE) NO  
X  
EXPECTED SUBMISSION DATE (15)  
MONTH DAY YEAR

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

BORON INJECTION TANK (BIT) WAS DILUTED BY PRIMARY WATER AFTER AN EQUIPMENT CLEARANCE PERMIT WAS RELEASED AND THE SYSTEM REALIGNED. THE VALVE THAT WAS WORKED ON WAS NOT TAGGED AND THEREFORE WAS NOT PART OF THE RESTORATION LINEUP. THE VALVE WAS OPEN AND DILUTED THE BIT TO BELOW THE LIMITS SET IN TECHNICAL SPECIFICATION 3.5.4.1. A HEAVY CONCENTRATION BATCH WAS MIXED AND THE BIT WAS BROUGHT INTO SPEC WITHIN THE ONE HOUR ACTION STATEMENT LIMIT.

CORRECTIVE ACTION INCLUDED SENDING A LETTER TO EACH PERSON RESPONSIBLE FOR ISSUING CLEARANCE PERMITS EXPLAINING THE REQUIREMENT TO ALSO INCLUDE ON THE RESTORATION FORM COMPONENTS INSIDE CLEARANCE BOUNDARIES BUT WHICH ARE NOT TAGGED.

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PDR ADOCK 05000316  
S PDR

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104  
EXPIRES 8/31/85

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 365A's) (17)

THE PRIMARY WATER FLUSH VALVE FOR A BORIC ACID TRANSFER PUMP WAS REMOVED FROM SERVICE TO REPLACE THE VALVE DIAPHRAGM. WHEN THE JOB WAS COMPLETED, THE VALVE WAS LEFT IN THE PARTIALLY OPEN POSITION BY THE WORKERS. THE OPERATIONS DEPARTMENT PREPARED A RESTORATION FORM TO RESTORE THE TAGGED OUT ISOLATION VALVES TO THEIR NORMAL OPERATING CONFIGURATION. SINCE THE VALVE WAS BEING WORKED ON, THERE WAS NO ISOLATION TAG PLACED ON IT. AN OPERATOR RESTORED THE TAGGED VALVES TO THE PROPER POSITIONS AND THEIR POSITIONS WERE INDEPENDENTLY VERIFIED. SINCE THE PRIMARY WATER VALVE WAS NOT ON THE RESTORATION FORM, IT WAS NOT CHECKED BY THE OPERATORS.

THIS INCIDENT HAPPENED DURING NORMAL PLANT OPERATIONSON JANUARY 17, 1984. HOWEVER, THE CLEARANCE NEEDED TO BE PICKED UP QUICKLY DUE TO A LOW LEVEL IN THE #24 REACTOR COOLANT PUMP STANDPIPE FROM WHICH THIS CLEARANCE REMOVED THE PRIMARY WATER SUPPLY.

A FEW MINUTES AFTER THE SYSTEM WAS "RESTORED" AND PLACED IN SERVICE (AT 0907), THE HEAT TRACE LOW ALARMS FOR THIS SYSTEM STARTED ALARMING AND OPERATORS WERE DISPATCHED TO INVESTIGATE. THE CONTROL ROOM OPERATORS ALSO NOTICED THE LEVEL IN THE BORIC ACID STORAGE TANKS (BIT RECIRCULATION SOURCE) INCREASING. THE OPERATORS IN THE PLANT WERE SENT TO VERIFY THE BORIC ACID STORAGE TANK LINEUPS AT WHICH TIME IT WAS DISCOVERED THAT THE PRIMARY WATER VALVE WAS PARTIALLY OPEN.

THE CHEMISTRY LAB WAS CALLED AT 0930 TO SAMPLE THE BIT AND THE BORIC ACID STORAGE TANK FOR THE BORIC ACID CONCENTRATION. THE LOWEST SAMPEL OBTAINED AT 1005 WAS 19,485 PPM. THE TECH SPEC MINIMUM CONCENTRATION IS 20,000 PPM. THE OPERATORS MIXED A HEAVY CONCENTRATION BATCH AND TRANSFERRED IT TO THE STORAGE TANK WHICH WAS RECIRCULATING THE BIT. TANKS WERE RESAMPLED AT 1100 AND WERE VERIFIED TO BE AT 20,438 PPM.

THE TECH SPEC CALLS FOR A MINIMUM VOLUME OF 900 GALLONS AND BETWEEN 20,000 AND 22,500 PPM BORON CONCENTRATION. THIS TECH SPEC WAS VIOLATED AND THE ACTION STATEMENT REQUIREMENTS MET. BIT WAS DECLARED INOPERABLE AT 1005 AND WAS RESTORED AT 1100. THE ACTION STATEMENT IS:

WITH THE BORON INJECTION TANK INOPERABLE, RESTORE THE TANK TO OPERABLE STATUS WITHIN 1 HOUR OR BE IN HOT STANDBY AND BORATED TO A SHUTDOWN MARGIN EQUIVALENT TO 1%  $\Delta K/K$  AT 200°F WITHIN THE NEXT 6 HOURS; RESTORE THE TANK TO OPERABLE STATUS WITHIN THE NEXT 7 DAYS OR BE IN HOT SHUTDOWN WITHIN THE NEXT 12 HOURS.

BASED ON A SAFETY EVALUATION FOR THIS SYSTEM FOR A PREVIOUS EVENT, IT WAS DETERMINED THAT THE TOTAL BORON INJECTION SYSTEM CONTAINS 966 GALLONS OF BORATED WATER, INCLUDING THE CONTENTS OF THE SUCTION AND DISCHARGE PIPING CARRYING THE RECIRCULATING BORATED WATER. TECHNICALLY, THE TOTAL AMOUNT OF BORON WAS WITHIN THE REQUIREMENTS IF THE OVERALL SYSTEM CONTENTS ARE USED.

T.S. LIMITS = 900 GALLONS x 20,000 PPM  
LOWEST LEVEL = 966 GALLONS x 19,485 PPM

AN EXCESS OF 7 POUNDS OF BORON OVER THE TECHNICAL SPECIFICATION AMOUNT WAS AVAILABLE.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

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

THE PRESENT EVENT IS SIMILAR (WITH RESPECT TO THE TYPE OF CONSEQUENCES) TO THE RECENT EVENT WHERE A SAMPLE VALVE ON THE BORON INJECTION TANK WAS LEFT OPEN UNTIL DISCOVERED A FEW HOURS LATER. HOWEVER, THIS EVENT IS LESS SEVERE IN THAT THE AMOUNT OF BORON THAT WOULD HAVE BEEN DELIVERED TO THE CORE IN CASE OF AN ACCIDENT WOULD HAVE BEEN GREATER THAN THAT IN THE PREVIOUS EVENT, AND IT DID NOT INVOLVE A LEAK IN THE ECCS SYSTEM. THE ATTACHED WESTINGHOUSE ANALYSIS SHOW THE EARLIER EVENT NOT TO HAVE HAD CONSEQUENCES WHICH ADVERSELY AFFECT PUBLIC HEALTH AND SAFETY.

SINCE THE EVENT CITED IN THIS LER IS LESS SEVERE THAN THE PREVIOUS EVENT, IT IS OUR CONCLUSION THAT THE ATTACHED WESTINGHOUSE ANALYSIS CONSERVATIVELY ENVELOPES THE POTENTIAL CONSEQUENCES.

IT IS THEREFORE CONCLUDED THAT THE EVENT CITED IN THIS LER DOES NOT CONSTITUTE AN UNREVIEWED SAFETY QUESTION AS DEFINED IN 10 CFR 50.59, NOR DOES IT CREATE A SUBSTANTIAL HAZARD TO THE HEALTH AND SAFETY OF THE PUBLIC.

THIS IS BEING REPORTED UNDER THE REQUIREMENTS OF PARAGRAPH 50.73 (A) (2) (V) IN THAT IT INCLUDES FAILURE OF SINGLE TRAIN SYSTEMS THAT PERFORM SAFETY FUNCTIONS, IF LOSS OF THE SINGLE TRAIN WOULD PREVENT THE FULFILLMENT OF THE SAFETY FUNCTION OF THE SYSTEM.

THIS INCIDENT IS ATTRIBUTED TO PERSONNEL ERROR IN THAT THE VALVE BEING WORKED ON WAS NOT INCLUDED ON THE SYSTEM RESTORATION SHEET. THE CLEARANCE PERMIT RESTORATION SHEET WAS PREPARED BY A SENIOR REACTOR OPERATOR WITH THE RESTORATION BEING PERFORMED BY 2 SENIOR NON-LICENSED OPERATORS.

CORRECTIVE ACTION INCLUDED SENDING A LETTER TO EACH PERSON RESPONSIBLE FOR ISSUING CLEARANCE PERMITS RE-EMPHASIZING THE PROCEDURAL REQUIREMENT TO ALSO INCLUDE ON THE RESTORATION FORM COMPONENTS INSIDE THE CLEARANCE BOUNDARIES BUT WHICH ARE NOT TAGGED.

PREVIOUS SIMILAR OCCURRENCES INCLUDE: 50-315/81-001, 82-039, 80-017, 77-031, AND 50-316/83-092, 79-024, 78-081, AND 78-045.

## WESTINGHOUSE NON-LOCA ANALYSIS W-AEP-83-654

A safety evaluation was made by Westinghouse to determine if the flow that would have been lost through the sample connection during a BIT injection event would have been sufficient to prevent the boron injection system from performing its functional requirements. The evaluation included a review of both the non-LOCA and LOCA analyses described in the D. C. Cook Unit 2 FSAR. The results are as follows.

NON-LOCA ANALYSES

The SI flow rate capable of being delivered to the core upon receipt of an SI signal would be slightly reduced from the value assumed in the updated FSAR analysis. Reducing the SI flowrate would delay the injection of the SI fluid to the RCS. This delay would not impact the predicted cooldown or return to power. This is because the doppler coefficient has turned the transient around prior to the borated SI water entering the core. Delaying or reducing the amount of boron injected to the core would not impact the results, i.e. the design basis would be met.

LOCA ANALYSES

Though Boron Concentration in the Injected Water in a LOCA scenario aids in the reduction of core power, the ECCS analyses presented in the FSAR does not take credit for any level of boron concentration. This is a conservatism assumed in the analysis codes.

Because of this, the only impact on current LOCA analyses for the BIT event outlined would be for its degradation of SI flow delivered to the RCS.

For large break LOCA cases, the Cook plants have been identified as being limited with Maximum Safeguards assumptions for Safety Injection. Consequently, a degradation of SI flows could be accommodated with no impact on large break LOCA analyses. The leak as outlined by failure of a sample valve to be closed in the BIT could be considered a reduction of the delivered SI flow and would actually be less conservative under this finding, yielding a reduced calculated PCT.

In the small break realm, however, there will be some minor impact. The pressure range of interest is from 1200 psi to 400 psi in the transient. The time between when core uncover becomes possible and when accumulators initiate flow to recover the core. In the small break analysis on file, this core uncover is greatest in the limiting 4-inch break case.

The impact on flow over this pressure range would vary from 5.1 gpm (at 400 psi) to 8.8 gpm (1200 psi). When compared to the SI flows input in the analysis, this would represent a reduction of 1% to 2.4% of SI flow over this range. If one were to use the established sensitivity of 20°F increase in calculated PCT for each percent reduction in SI flow, an increase in PCT of 48°F would be estimated. As the limiting small break case shows a PCT of 1667°F, adequate margin would exist to assure compliance with the 2200°F regulatory limit.





**INDIANA & MICHIGAN ELECTRIC COMPANY**

DONALD C. COOK NUCLEAR PLANT  
P.O. Box 458, Bridgman, Michigan 49106  
(616) 465-5901

February 16, 1984

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

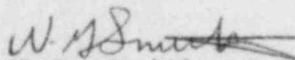
Operating License DPR-74  
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10CFR50.73  
entitled Licensee Event Reporting System, the following  
report/s are being submitted:

RO 84-001-0

Sincerely,

  
W.G. Smith, Jr.  
Plant Manager

/cbm

Attachment

cc: John E. Dolan  
J.G. Keppler, RO:III  
M.P. Alexich  
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