

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) DONALD C. COOK UNIT I										DOCKET NUMBER (2) 0 5 0 0 0 3 1 5										PAGE (3) 1 OF 0 2																																													
TITLE (4) AUXILIARY FEED PUMP TURBINE FAILURE TO TRIP																																																																	
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			4			0			9			8			4			8			4			0			0			4			0			0			5			0			9			8			4			0 5 0 0 0						0 5 0 0 0					
OPERATING MODE (9) 1						THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)																																																											
POWER LEVEL (10) 1 0 0						20.402(b)						20.406(a)						80.73(a)(2)(iv)						73.71(b)																																									
						20.406(a)(1)(i)						80.38(a)(1)						80.73(a)(2)(v)						73.71(a)																																									
						20.406(a)(1)(ii)						80.38(a)(2)						80.73(a)(2)(vi)						OTHER (Specify in Abstract below and in Text, NRC Form 365A)																																									
						20.406(a)(1)(iii)						80.73(a)(2)(i)						80.73(a)(2)(vii)(A)																																															
						20.406(a)(1)(iv)						80.73(a)(2)(ii)						80.73(a)(2)(vii)(B)																																															
						20.406(a)(1)(v)						80.73(a)(2)(iii)						80.73(a)(2)(x)																																															
LICENSEE CONTACT FOR THIS LER (12)																																																																	
NAME R. L. DUDDING MAINTENANCE 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 NPDOS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS																																																							
X	B A	S H V	0 7 5	Y																																																													
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)

DURING SURVEILLANCE TESTING OF THE TURBINE DRIVEN AUXILIARY FEED PUMP USING A REVISED PROCEDURE, THE THROTTLE TRIP VALVE FAILED TO TRIP THE TURBINE. THE CONTROL ROOM TRIP BUTTON HAD NOT PREVIOUSLY BEEN USED TO CLOSE THE THROTTLE TRIP VALVE. A UNIT SHUT DOWN WAS COMPLETED AS REPAIRS COULD NOT BE ACCOMPLISHED WITHIN THE T.S. 3.7.1.2 LCO TIME LIMIT OF 72 HOURS. THE FAILURE WAS DUE TO EXCESSIVE LEAK-OFF OF STEAM USED TO ASSIST VALVE CLOSURE. THE EXCESSIVE LEAK-OFF WAS CAUSED BY STEAM EROSION OF THE VALVE BONNET ADJACENT TO THE OUTER WALL OF THE LEAK-OFF BUSHING AND SOME MINOR INTERNAL EROSION OF THE BUSHING. AS AN INTERIM MEASURE, THE FIRST ABOVE-SEAT LEAK-OFF LINE WAS CAPPED TO RETAIN SUFFICIENT STEAM TO OPERATE THE VALVE. REPLACEMENT PARTS HAVE BEEN ORDERED. THE UNIT 2 VALVE HAS BEEN INSPECTED AND NO SIGNIFICANT INDICATIONS WERE FOUND. TO PREVENT A RECURRENCE, THE VALVES FOR EACH UNIT WILL BE INSPECTED DURING ALTERNATE REFUELING OUTAGES.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
DONALD C. COOK UNIT I	0500031584	—	004	—	002	OF 02

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

AT 0311 ON 4/6/84, WHILE IN MODE 1 AT 100% POWER, SURVEILLANCE TESTING WAS BEING PERFORMED ON THE UNIT 1 TURBINE DRIVEN AUXILIARY FEED PUMP (SJ). DURING THIS TEST THE THROTTLE TRIP VALVE FAILED TO TRIP THE TURBINE AND THE PUMP WAS REMOVED FROM SERVICE. A REVISED PROCEDURE, 1-OHP 4030.STP.017, REV. 10 WAS BEING IMPLEMENTED FOR THE FIRST TIME AND IT REQUIRED USE OF THE CONTROL ROOM TRIP PUSH BUTTON TO SHUT THE THROTTLE TRIP VALVE. EARLIER REVISIONS OF THE PROCEDURE HAD DIRECTED THE OPERATOR TO GO "TO CLOSED" ON THE THROTTLE TRIP VALVE CONTROL SWITCH (I.E., DRIVE THE VALVE CLOSED WITH THE MOTOR). THE PUSH BUTTON TRIP RECOMMENDATION OF THE MANUFACTURER WAS DISCOVERED DURING RESEARCH, WHILE PREPARING A DIFFERENT PROCEDURE. SINCE THIS METHOD OF TRIPPING THE TURBINE HAD NOT BEEN FORMALLY UTILIZED IN THE PAST, THE DURATION OF THE REPORTED CONDITION CANNOT BE CONCLUSIVELY DETERMINED.

INVESTIGATION FAILED TO UNCOVER THE CAUSE OF THE CONDITION DURING THE 72 HOUR LIMIT OF TECHNICAL SPECIFICATION 3.7.1.2. UNIT SHUT-DOWN BEGAN AT 0300 HOURS ON 4/9/84 AND MODE 4 WAS REACHED AT 1455 HOURS ON THAT DATE. AT 0700 HOURS ON 4/9/84 AN UNUSUAL EVENT WAS DECLARED AND REQUIRED NOTIFICATIONS WERE MADE.

CONTINUED INVESTIGATION FOUND THE FAILURE OF THE SCHUTTE & KOERTING COMPANY 4" THROTTLE TRIP VALVE (TYPE GS-2) TO BE CAUSED BY EXCESSIVE LEAK-OFF OF TRIP ASSIST STEAM DUE TO STEAM EROSION OF THE LEAK OFF BUSHING (PART #8, DWG. 69-XC-113) AND THE VALVE BONNET (COVER WITH CYLINDER, PART #48, DWG. 69XC-113).

IDENTIFICATION OF THE ROOT CAUSE HAD BEEN DIFFICULT DUE TO THE FLOW PATH ERODED INTO THE VALVE BONNET BEING CONCEALED BEHIND THE LEAK OFF BUSHING. UPON DISCOVERY OF THE HIDDEN STEAM EROSION, A DESIGN CHANGE, RFC-01-1973, WAS IMPLEMENTED WHICH CONSISTED OF CAPPING THE FIRST ABOVE-SEAT LEAK-OFF LINE. THIS CHANGE ALLOWED RETENTION OF STEAM OF SUFFICIENT VOLUME AND PRESSURE TO TRIP THE VALVE AS DESIGNED. SURVEILLANCE TESTING WAS COMPLETED AND THE PUMP RETURNED TO SERVICE AT 0530 ON 4/11/84.

THE CONDITION OF THE THROTTLE TRIP VALVE PRIOR TO REPAIRS LEFT THE AUXILIARY FEED PUMP TURBINE WITHOUT THE AUTOMATIC OVER-SPEED TRIP CAPABILITY. THE ELECTRICAL CLOSE CAPABILITY REMAINED OPERABLE AS DID THE CONTAINMENT ISOLATION VALVES FOR THE AUXILIARY TURBINE STEAM SUPPLY. THE EAST AND WEST MOTOR-OPERATED AUXILIARY FEED PUMPS REMAINED OPERABLE.

IN AN ACCIDENT SITUATION, OVER-SPEED DESTRUCTION OF THE TURBINE COULD HAVE BEEN A CONCEIVABLE RESULT OF THE THROTTLE TRIP VALVE FAILURE. SUCH DESTRUCTION WOULD HAVE PREVENTED A TIMELY RECOVERY OF THE PUMP CAPABILITY.

THE UNIT 2 THROTTLE TRIP VALVE HAS BEEN INSPECTED FOR A SIMILAR CONDITION. NO SIGNIFICANT INDICATIONS WERE NOTED DURING THE INSPECTION. AS A PREVENTIVE MEASURE, THE THROTTLE TRIP VALVE FOR EACH UNIT WILL BE INSPECTED DURING ALTERNATE REFUELING OUTAGES.

PREVIOUS THROTTLE TRIP VALVE FAILURES WERE REPORTED AS 316/80-003, 80-017 AND 80-024.



**INDIANA & MICHIGAN ELECTRIC COMPANY**

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

May 9, 1984

United States Nuclear Regulatory Commission  
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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 84-004-0

Sincerely,

*E L Townley*

FOR W.G. Smith, Jr.  
Plant Manager

/cbm

Attachment

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