

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
D.C. COOK NUCLEAR PLANT, UNIT 2DOCKET NUMBER (7)
0 5 0 0 0 3 1 1 6 1 OF 0 3

PAGE (3)

TITLE (4)

REACTOR 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)				
1	0	2	9	8	5	8	5	0	3	5	0	5	0	0	0
1	0	2	9	8	5	8	5	0	3	5	0	5	0	0	0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11):

OPERATING MODE (9)	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
POWER LEVEL (10)	0 1 7 9	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)
	<input type="checkbox"/>	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
	<input type="checkbox"/>	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
	<input type="checkbox"/>	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME
A.A. BLIND - ASSISTANT PLANT MANAGER

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
X	JIC	BRKW	120	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE):
☒ NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

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

ON OCTOBER 29, 1985, AT 1357 HOURS WITH UNIT 2 AT 79 PERCENT REACTOR THERMAL POWER, A REACTOR TRIP SIGNAL WAS RECEIVED FROM REACTOR COOLANT SYSTEM LOW FLOW. REACTOR TRIP BREAKER "A" (LEEE/BRK) FAILED TO OPEN ON RECEIPT OF THE TRIP SIGNAL. THE INSERVICE "B" REACTOR TRIP BREAKER FUNCTIONED CORRECTLY AND THE REACTOR WAS PROPERLY SHUT DOWN.

POST-TRIP REVIEW SHOWED THAT THE ORIGINAL TRIP INITIATOR WAS A SPURIOUS INDICATION OF LOSS OF FLOW DUE TO FALSE OPEN INDICATION OF THE NO. 2 REACTOR COOLANT PUMP (RCP) BREAKER. WE BELIEVE THAT THE TRIP SIGNAL WAS IN REACTION TO A MOMENTARY DIP IN THE OUTPUT VOLTAGE OF THE CRID AND THE "LOSS OF RCP" WAS THE FIRST REACTION TO THIS VOLTAGE DIP. THIS VOLTAGE DIP IS BELIEVED TO HAVE BEEN CAUSED BY AN INTERMITTENT SHORT, ACTIVATED BY BUMPING A RADIATION MONITOR DURING TROUBLESHOOTING ACTIVITIES. THE BREAKER FAILED TO TRIP DUE TO FAILURE OF THE UNDERVOLTAGE TRIP ASSEMBLY DEVICE TO FUNCTION PROPERLY. THE UNIT 2 "A" REACTOR TRIP BREAKER HAS BEEN REPLACED WITH A SPARE BREAKER WHICH HAS BEEN THOROUGHLY INSPECTED AND TESTED PER PRESCRIBED PROCEDURES.

TO PREVENT RECURRENCE; 1) THE CONTROL AND INSTRUMENTATION SUPERVISOR HAS CAUTIONED ALL TECHNICIANS AND SUPERVISORS ON THE POTENTIAL IMPACT OF ACCIDENTAL SHORTING OR COMPONENT FAILURE IN EQUIPMENT POWER FROM CRID BUS INVERTERS. 2) PRIOR TO TROUBLESHOOTING THESE TYPES OF LOADS, EFFORTS WILL BE MADE TO ISOLATE THE COMPONENT FROM THE CRID BUS INVERTERS. 3) THE REACTOR TRIP AND BYPASS BREAKERS ON BOTH D.C. COOK UNITS HAVE BEEN THOROUGHLY INSPECTED AND TESTED AND CAN BE RELIED UPON TO FUNCTION AS REQUIRED.

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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			
D.C. COOK NUCLEAR PLANT, UNIT 2	0 5 0 0 0 3 1 6	8 5	— 0 3 5 —	0 0	0 2	OF	0 3

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

ON OCTOBER 29, 1985, AT 1357 HOURS WITH UNIT 2 AT 79 PERCENT POWER, A REACTOR TRIP SIGNAL WAS RECEIVED FROM REACTOR COOLANT SYSTEM LOW FLOW. REACTOR TRIP BREAKER "A" (IEEE/BKR) FAILED TO OPEN ON RECEIPT OF THE TRIP SIGNAL. THE INSERVICE "B" REACTOR TRIP BREAKER FUNCTIONED CORRECTLY AND THE REACTOR WAS PROPERLY SHUT DOWN.

POST-TRIP REVIEW SHOWED THAT THE ORIGINAL TRIP INITIATOR WAS A SPURIOUS INDICATION OF LOSS OF FLOW DUE TO FALSE OPEN INDICATION OF THE NO. 2 REACTOR COOLANT PUMP (RCP) BREAKER. SUBSEQUENT TESTING SHOWED THAT THE "A" REACTOR TRIP BREAKER UNDERVOLTAGE TRIP ASSEMBLY HAD RECEIVED A VALID TRIP SIGNAL FROM THE PROTECTION SYSTEM (VOLTAGE HAD IN FACT BEEN REMOVED FROM THE UNDERVOLTAGE TRIP ASSEMBLY COIL) AND THAT THE PROTECTIVE SYSTEM WOULD IN FACT GENERATE THIS TRIP SIGNAL ON RECEIPT OF NEED-TO-TRIP INDICATIONS. TROUBLESHOOTING OF THE ASSOCIATED POWER SUPPLY (CRID-II) SHOWED IT TO BE OPERATING PROPERLY. THE CONCLUSION REACHED (CONFIRMATION OF THE ORIGINAL HYPOTHESIS) WAS THAT THE TRIP SIGNAL WAS IN REACTION TO A MOMENTARY DIP IN THE OUTPUT VOLTAGE OF THE CRID AND THE "LOSS OF RCP" WAS THE FIRST REACTION TO THIS VOLTAGE DIP.

INVESTIGATION OF ACTIVITIES IN PROGRESS AT THE TIME OF THE REACTOR TRIP REVEALED THAT TROUBLESHOOTING OF A RADIATION MONITORING UNIT, THAT RECEIVES INSTRUMENT AND CONTROL POWER FROM CRID II, WAS IN PROGRESS. RECONSTRUCTION OF THE ACTIONS OF THE TECHNICIAN CONDUCTING THE TROUBLESHOOTING FAILED TO IDENTIFY ANY ACTION THAT WOULD HAVE AFFECTED THE CRID II OUTPUT VOLTAGE. HOWEVER, SUBSEQUENT TROUBLESHOOTING OF THIS RADIATION MONITORING UNIT REVEALED A FAILED ELECTRICAL COMPONENT (PHOTOHELIC CELL) WHICH GAVE INDICATION OF PRIOR INTERMITTENT FAILURE BEFORE ITS FINAL FAILURE. THIS WAS DISCOVERED BY "BUMPING" THE RADIATION MONITORING UNIT, AN ACTION THAT VERY CONCEIVABLY COULD HAVE OCCURRED DURING THE TECHNICIAN'S TROUBLESHOOTING ACTIVITIES. THIS PHOTOHELIC CELL IS POWERED DIRECTLY OFF THE CRID II AND FAILURE IN THE MANNER OBSERVED, EVEN INTERMITTENTLY, WOULD VERY LIKELY HAVE RESULTED IN AN UNNOTICEABLE, MOMENTARY DIP IN THE CRID II OUTPUT VOLTAGE THEREBY INITIATING THE TRIP SIGNAL. ALTHOUGH THERE IS NO POSITIVE EVIDENCE THAT THE PHOTOHELIC CELL SHORTED OR OTHERWISE AFFECTED THE CRID II OUTPUT VOLTAGE, WE BELIEVE THAT THIS WAS THE CAUSE.

OUR INVESTIGATION HAS DETERMINED THAT THE BREAKER FAILED TO TRIP DUE TO FAILURE OF THE UNDERVOLTAGE TRIP ASSEMBLY DEVICE TO FUNCTION PROPERLY. THE UNIT 2 "A" REACTOR TRIP BREAKER HAS BEEN REPLACED WITH A SPARE BREAKER WHICH HAS BEEN THOROUGHLY INSPECTED AND TESTED PER PRESCRIBED PROCEDURES. THE UNDERVOLTAGE TRIP ASSEMBLY WHICH FAILED HAS BEEN IMPOUNDED, AND THE ORIGINAL "A" BREAKER HAS BEEN SET ASIDE, BOTH FOR FURTHER INVESTIGATION. ALTHOUGH WE HAVE NOT CONFIRMED THE EXACT CAUSE OF THE DEGRADED PERFORMANCE OF THE UNDERVOLTAGE TRIP ASSEMBLY, WE SUSPECT THAT THE PROBLEM MAY BE RELATED TO LUBRICATION OF THE UNDERVOLTAGE TRIP ASSEMBLY LINKAGE.

THE REACTOR PROTECTION SYSTEM FUNCTIONED AND CONTINUES TO FUNCTION CORRECTLY, CONSERVATIVELY, AND AS DESIGNED. THEREFORE, THERE WAS NO THREAT TO THE HEALTH AND SAFETY OF THE PUBLIC.

TO PREVENT RECURRENCE; 1) THE CONTROL AND INSTRUMENTATION SUPERVISOR HAS CAUTIONED ALL TECHNICIANS AND SUPERVISORS ON THE POTENTIAL IMPACT OF ACCIDENTAL SHORTING OR COMPONENT FAILURE IN EQUIPMENT POWER FROM CRID BUS INVERTERS. 2) PRIOR TO

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
D.C. COOK NUCLEAR PLANT, UNIT 2	0 5 0 0 0 3 1 6 8 5	0 3 5	0 0	0 3	OF	0 3	

TEXT (If more space is required, use additional NRC Form 385A's) (17)

TROUBLESHOOTING THESE TYPES OF LOADS, EFFORTS WILL BE MADE TO ISOLATE THE COMPONENT FROM THE CRID BUS INVERTERS. 3) THE REACTOR TRIP AND BYPASS BREAKERS ON BOTH D.C. COOK UNITS HAVE BEEN THOROUGHLY INSPECTED AND TESTED AND CAN BE RELIED UPON TO FUNCTION AS REQUIRED FOR THE FOLLOWING REASONS:

- REPLACEMENT OF THE SUSPECT UNDERVOLTAGE TRIP ASSEMBLY'S WITH THE NEW UNDERVOLTAGE TRIP ASSEMBLY'S AND SUBSEQUENT THOROUGH TESTING.
- CONFIRMATION THAT THE PERFORMANCE CHARACTERISTICS OF THE BREAKERS THEMSELVES WERE CONSISTENT THROUGHOUT THE SEQUENCE OF TESTING.
- INSTALLATION AND FUNCTIONAL TESTING OF SHUNT TRIP ATTACHMENTS.
- PERFORMANCE OF THE TECHNICAL SPECIFICATION 18-MONTH SURVEILLANCES ON BOTH UNITS PRIOR TO STARTUP.
- CAREFUL EVALUATION IN CONJUNCTION WITH WESTINGHOUSE ELECTRIC CORPORATION, THE MANUFACTURER OF THE BREAKER, OF THE EVENT TO ENSURE THAT THE ROOT CAUSE COULD BE ISOLATED TO THE UNDERVOLTAGE TRIP ASSEMBLY.
- IMPLEMENTATION IN UNIT 2 OF THE UNIT 1 TECHNICAL SPECIFICATION TESTING REQUIREMENTS FOR SHUNT TRIP ATTACHMENTS.
- AS AN INTERIM MEASURE, INCREASE FROM BI-MONTHLY (AS CURRENTLY REQUIRED) TO MONTHLY OF THE TECHNICAL SPECIFICATION ACTIVE TESTING REQUIREMENT OF THE TRIP BREAKER, PENDING FURTHER EVALUATION OF THE EVENT, INCLUDING ANY DESIRABLE TECHNICAL SPECIFICATION CHANGES.