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)
Cooper Nuclear Station	0 5 0 0 0 2 9 8	1 OF 0 3

TITLE (4)

Reactor Water Cleanup System Valve Closure (Group 3 Isolation) Due to Relay Failure

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 9	1 6	8 8	8 8	0 2 3	0 0	1 0	1 7	8 8		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)			
	N	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	1 0 0	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)	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
	AREA CODE
Ralph W. Krause	4 0 2 8 2 5 - 1 3 8 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	
X	J M	R L Y	G 0 8 0	Y							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE)		0 2	0 1	8 9

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

At 3:16 P.M. on September 16, 1988, a Division II, Group 3 (Reactor Water Cleanup [RWCU] System) Isolation occurred, resulting in the closure of the outboard RWCU supply isolation valve. The valve closure was caused by the coil failure of a normally energized relay in the Primary Containment and Reactor Isolation logic for the RWCU System. The failed relay was a General Electric Model CR120A, 115 VAC.

An analysis is in progress to determine the exact failure mechanism. The relay had been in-service for approximately 13 years and per the vendor, the relay coil may have reached the reasonable lifetime for normally energized relays of this type.

The immediate corrective action was to replace the failed relay coil. To prevent recurrence, an evaluation will be conducted to determine whether to replace the existing 115 VAC, safety-related CR120A relays with a different type, or to periodically replace the relay coils at a specified frequency. The appropriate course of action will be dictated by the results of the coil failure mechanism analysis. The recommended action will be completed prior to plant startup from the 1989 Maintenance and Refueling Outage.

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

A. Event Description

At 3:16 P.M. on September 16, 1988, a Division II, Group 3 (Reactor Water Cleanup [RWCU] System) Isolation occurred, resulting in the closure of the outboard RWCU supply isolation valve, RWCU-MOV-M018. The accompanying annunciator indicated the automatic valve closure was due to either high area temperature or high system flow. However, a review of area temperature and system flow data indicated no abnormal conditions existed at the time of the valve closure. An equipment troubleshooting effort determined the coil of normally energized relay PCIS-REL-K64 had failed. The coil failure caused the relay to shift to the de-energized position, thus providing a closure signal to valve RWCU-MOV-M018. The failed relay was a General Electric Model CR120A, 115 VAC.

B. Plant Status

At the time of the occurrence, the plant was in steady state operation at 100% of full power (789 MWe).

C. Basis for Report

This occurrence is reportable in accordance with 10CFR50.73(a)(2)(iv), an unplanned actuation of an Engineered Safety Feature (ESF), Group 3 Isolation.

D. Cause

A review of plant maintenance records indicated the relay had been in-service since construction, approximately 15 years. The relay is normally energized during plant operation. Therefore, estimates indicate the relay coil had in excess of 100,000 hours of energized operation. Although the CR120A relay does not carry a service life in terms of hours, the vendor has indicated the relay coil may have reached the reasonable lifetime for normally energized relays. An analysis of the failed relay coil is being performed to further clarify the failure mechanism. The results of the analysis will be included in a supplemental report tentatively scheduled for submission February 1, 1989.

E. Safety Consequences

None. The function of the valve (RWCU-MOV-M018) and this portion of the closure logic is to isolate a potential reactor coolant leakage path if high RWCU area temperature or high RWCU system flow is detected. The circuit logic is normally energized, and de-energized to cause an isolation. Therefore, the logic is designed to fail to the safe (isolate) condition.

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

F. Safety Implications

The normal function of the RWCU system is to maintain the purity of the reactor coolant. If the relay coil failure had occurred at a time when impurities were being introduced into the reactor coolant, the only method of impurity removal would be eliminated. Depending on the rate of impurity addition and the time required to identify and correct the cause of the RWCU isolation, an unplanned reactor shutdown may have resulted if the Technical Specification limits for reactor water chemistry were exceeded.

All normally energized safety-related 115 VAC, CR120A relays used at Cooper Station are in containment isolation circuit logics, which de-energize when an isolation signal is present. Therefore, the component response to a relay coil failure would be identical to an isolation signal, (i.e., fail safe).

G. Corrective Actions

The immediate action taken upon valve closure was to respond to the isolation, and initiate action to determine the cause. Corrective maintenance activities identified the failed component, and the relay coil was replaced. Post maintenance testing verified proper relay operation.

To prevent recurrence, an evaluation will be conducted to determine whether to replace the existing 115 VAC, safety-related CR120A relays with a different type, or to periodically replace the relay coils at a specified frequency. The appropriate course of action will be dictated by the results of the coil failure mechanism analysis. The recommended action will be completed prior to plant startup from the 1989 Maintenance and Refueling Outage.

H. Past Similar Events

Two previous 115 VAC, safety-related CR120A normally energized relay coil failures occurred in 1988 at Cooper Nuclear Station. The first failure was reported via Licensee Event Report 88-012, while the second failure was not a reportable event. At the time of the previous report, the failure appeared to be random and it was determined no further action was necessary.

Nebraska Public Power District

COOPER NUCLEAR STATION
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CNSS886344

October 17, 1988

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Gentlemen:

Cooper Nuclear Station Licensee Event Report 88-023 is forwarded as an attachment to this letter.

Sincerely,

G. R. Horn
Division Manager of
Nuclear Operations

GRH:sg

Attachment

cc: R. D. Martin
L. G. Kuncl
R. E. Wilbur
V. L. Wolstenholm
G. A. Trevors
INPO Records Center
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R. J. Singer
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