



Nebraska Public Power District

COOPER NUCLEAR STATION
P.O. BOX 98, BROWNVILLE, NEBRASKA 68321
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NLS940132

December 23, 1994

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

Dear Sir:

Cooper Nuclear Station Licensee Event Report 94-018, Supplement 1 is forwarded as an attachment to this letter.

Sincerely,


J. T. Herron
Plant Manager

/nr

Attachment

cc: L. J. Callan
G. R. Horn
J. H. Mueller
R. G. Jones
R. A. Sessoms
K. C. Walden
INPO Records Center
NRC Resident Inspector
R. J. Singer
CNS Training
CNS Quality Assurance

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH
THIS INFORMATION COLLECTION REQUEST: 50.0 HRS.
FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO
THE INFORMATION AND RECORDS MANAGEMENT BRANCH
(MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION,
WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK
REDUCTION PROJECT (3150-0104), OFFICE OF
MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.FACILITY NAME (1)
COOPER NUCLEAR STATIONDOCKET NUMBER (2)
05000298PAGE (3)
1 OF 4TITLE (4) Reactor Core Isolation Cooling System Trip and Throttle Valve Design Deficiency
Due to the Reset Motor Being Powered By AC Instead of DC

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 NAME	DOCKET NUMBER
08	20	94	94	-- 018 --	01	12	23	94	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		0	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)	
			20.405(a)(1)(i)		50.36(c)(1)		X 50.73(a)(2)(v)		73.71(c)	
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER	
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in	
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		Abstract below	
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		and in Text, NRC Form 366A)	

LICENSEE CONTACT FOR THIS LER (12)

NAME
Gautam Sen, Senior Staff Engineer, Nuclear licensing
and SafetyTELEPHONE NUMBER (Include Area Code)
(402) 825-3811

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
N/A	N/A	N/A	N/A	NO					

SUPPLEMENTAL REPORT EXPECTED (14)

YES
(If yes, complete EXPECTED SUBMISSION DATE).

X NO

EXPECTED
SUBMISSION
DATE (15)

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On August 20, 1994, while reviewing surveillance test requirements associated with the Reactor Core Isolation Cooling (RCIC) System, the reset function for RCIC-MOV-M014, the RCIC Turbine Trip Throttle Valve, was determined to be powered by an AC, not a DC motor. However, the design basis of the RCIC System states that it shall be independent of AC power and shall depend only on DC power for short term operation.

In the event of a Station Blackout (SBO) in which all offsite and onsite AC power is lost for a period of up to 4 hours, RCIC is required to function to provide residual heat removal. However, due to the reset motor being powered by AC, neither automatic nor remote manual reset of the valve would have been possible although local manual reset could be performed.

To prevent recurrence of such an event, the AC motor operator on the RCIC-MOV-M014 valve was replaced with a DC motor operator on December 22, 1994.

Per NUREG-1022, the cause of the event is attributed to personnel error.

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TEXT CONTINUATION

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COOPER NUCLEAR STATION		05000298	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
			94	-- 018 --	01	

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)
Plant Status

On August 20, 1994, when this condition was discovered, the plant was in cold shutdown with no fuel handling in progress.

Event Description

On August 20, 1994, while performing a review of surveillance requirements associated with the RCIC System, it was discovered that the RCIC Turbine Trip and Throttle Valve, RCIC-MOV-MO14 is powered from an AC power source (EE-MCC-K) and that the valve is non-essential.

These conditions would prevent the motor operated valve RCIC-MOV-MO14 from performing its intended function during a Station Blackout (SBO) event and during required RCIC operations per Appendix G and Chapter IV, Section 7.5 of the USAR. According to the USAR, the RCIC System is required to be capable of initiation and short-term operation (vessel level control during four hour coping period) independently of AC power.

The District's response to 10CFR Part 50.63 (Station Blackout Rule) takes credit for the automatic operation of the RCIC System. This includes the automatic initiation of the RCIC System upon low Reactor Pressure Vessel (RPV) water level, shutdown of the RCIC System upon a high RPV water level, re-initiation of the system upon a later low RPV water level. For the RCIC System to operate automatically, the motor and the motor operator for valve MO14 must cycle the valve under the SBO condition. However, with valve MO14 being powered from an AC source, it would not function under these circumstances and therefore, the RCIC System would not perform its safety function per the USAR in case of an SBO event.

In August of 1977, a design change was implemented which installed a motor operator on the turbine trip/throttle valve and a control switch in the Control Room. The motor operator would reset the valve (reopen and latch) so that an operator did not have to be dispatched to reset the valve. The motor operator was added as a convenience and was not considered as a requirement for RCIC to meet its safety function which was that RCIC would be capable of initiation and short term operation independent of AC power.

In June of 1981, in response to NUREG 0737, the logic for the RCIC System was changed by another design change such that the high water level trip signal to the turbine trip solenoid valve was removed and the signal was installed into the RCIC-MOV-MO131 (Steam Supply Valve to RCIC Turbine) close circuit. This design change also modified the RCIC-MO14 logic to cause MO14 to automatically reset the turbine trip/throttle valve when MO131 was fully closed and the turbine trip/throttle valve was closed. It is necessary for motor operator MO14 to cycle closed and open to reset the valve due to the loss of hydraulic oil pressure that occurs when the turbine coasts down after the steam supply valve closes. The requirement in NUREG 0737 for automatic reset of the turbine trip/throttle valve, RCIC-MOV-MO14, made its motor and motor operator essential and required for RCIC operation. However, the FSAR was not updated to reflect this change at the time of this design change.

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

In June 1986, district personnel working with a consultant on the Q-List, misclassified the motor and motor operator for the RCIC-MOV-M014 valve as non-essential. After their review of the original design documents and design changes, they failed to recognize that the design change, per the requirement in NUREG-0737, made the motor and motor operator on the RCIC-MOV-M014 valve essential.

From 1989 through 1991, the District prepared a response to the SBO Rule, 10CFR Part 50.63. In that response, as part of the four hour coping requirements for a SBO condition, the RCIC System was chosen as a system capable of operating without AC power for maintaining the vessel water level. The statement in the USAR, Chapter IV, Section 7.5, that RCIC is capable of initiation and short term operation without AC power, provided the basis for utilizing the RCIC System during a station blackout. No additional reviews of the system were performed to determine its AC independence.

Cause

The root cause of this event is personnel error due to inadequate skills or knowledge of the personnel involved in this event.

First, a personnel error occurred when the engineer preparing the design change in June of 1981 identified the affected sections of the FSAR as references but failed to realize that those FSAR sections need to be changed. If this FSAR change had been made, the FSAR review for preparing the SBO Rule response would have indicated that since the RCIC System is not operable independent of AC power, it could not be taken credit for as an operable system under an SBO condition.

Secondly, while performing the SBO coping analysis to determine the appropriate coping category, a personnel error was made by not investigating, at length, the capability of the system such as RCIC to operate under the SBO condition prior to selecting it.

The contributing cause is lack of information validation or verification because the function of RCIC-MOV-M014 valve was not accurately determined by the personnel prior to classifying the motor and the motor operator. As a result, failure of personnel involved in Q-List preparation to classify the motor and motor operator for the RCIC-MOV-M014 Valve as essential became a contributing factor for the event.

Safety Significance

A total loss of AC power under the SBO condition would prevent the motor from recycling the RCIC-MOV-M014 valve. As a result, the RCIC System would be inoperable in providing residual heat removal during four (4) hours of SBO coping period. However, HPCI System and local manual reset capability of RCIC will still be available for vessel level control during the SBO event. Therefore, safety significance of this event is minimal in case of an SBO event.

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

Corrective Action

The following immediate corrective actions have already been taken to correct the existing condition:

- 1) A review of the RCIC System was conducted to ensure that other components required for RCIC to meet its safety function and AC dependence did not exist. The review did not identify any such components.
- 2) A review of the HPCI System for AC dependence has been completed because the USAR, Section VI-5.2.2 states that the considerations for operation of the HPCI System without AC power are the same as for the RCIC System. The review has not identified any such components.
- 3) An internal CNS procedure, Regulatory Correspondence Control, has been developed to ensure that the information transmitted to the NRC is complete and accurate. This procedure has already been in effect since December 5, 1994.
- 4) A tailgate session has been held with engineers in NED to discuss the events that led up to this LER, stress the importance of validating information and discuss the effect of a design change on the design basis of a system.

In order to prevent recurrence of such an event, the AC motor operator on the RCIC-MOV-M014 valve was replaced with a DC motor operator on December 22, 1994.

With respect to misclassification of the motor and motor operator for the RCIC-MOV-M014 valve, no additional corrective actions have been taken. Engineering Procedure 3.13 has already been significantly enhanced since the occurrence of the error in 1986. The enhancement includes step-by-step methodology, criteria, and controls to be used in the component classification process. It also requires answers to specific questions presented in Component Application Data Sheets, Component Application Analysis Sheets, and Component Evaluation Sheets. The elements that presently exist in Procedure 3.13 would have prevented such a misclassification.

Similar Events

None

Correspondence No: NLS940132

The following table identifies those actions committed to by the District in this document. Any other actions discussed in the submittal represent intended or planned actions by the District. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITTED DATE OR OUTAGE
None	