Nebraska Public Power District

COOPER NUCLEAR STATION
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CNSS923648

May 20, 1992

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

Dear Sir:

Cooper Nuclear Station Licensee Event Report 92-007, Revision 0, is being forwarded as an attachment to this letter.

Sincerely,

R. L. Gardner
Acting Division Manager
of Nuclear Operations
Cooper Nuclear Station

RLG/bjs

Attachment

cc: R. D. Martin
G. R. Horn
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R. E. Wilbur
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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 4

TITLE (4) Actuation Of Shutdown Cooling Isolation Valves Due To Low Reactor Pressure While Warming The Residual Heat Removal System

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	2 0	9 2	9 2	— 0 0 7	— 0 0	0 5	2 0	9 2		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		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
John R. Myers	AREA CODE 4 0 2 — 8 2 5 — 3 8 1 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	

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)

On April 20, 1992, at 3:28 and 5:19 a.m., with the Reactor at approximately atmospheric pressure and a temperature of 240 degrees Fahrenheit in the Reactor Recirculation system, the Shutdown Cooling Isolation Valves (Group 2) automatically closed. Operating personnel were in the process of warming up the Residual Heat Removal system prior to placing it in Shutdown Cooling at the start of a planned maintenance outage. Both Shutdown Cooling isolation valves closed in each instance as a result of the actuation of the Shutdown Cooling high suction pressure interlock. Reactor pressure was increased and Shutdown Cooling subsequently placed in service without further difficulties.

The most probable cause of these events was void formation and collapse resulting in spurious actuation of the Shutdown Cooling high suction pressure interlock switch(es). Typically, the Reactor is at a pressure of 25 - 30 psig when Shutdown Cooling is initiated. With water in the piping at or near saturation, voids could form upon depressurization. There was no procedural guidance indicating the need to maintain pressure in the Reactor to ensure voids would not form while warming the Shutdown Cooling lines. A procedure change has been processed to provide guidance to maintain Reactor pressure to prevent actuation of the pressure interlock while placing Shutdown Cooling in service.

A. Event Description

On April 19, at 7:00 p.m., the plant was removed from service for a planned maintenance shutdown. On April 20, at approximately 2:30 a.m., the Shutdown Cooling system isolation valves were opened and warming of the Residual Heat Removal (RHR) system was initiated. Since the setpoint for the Shutdown Cooling high suction pressure interlock had been cleared, and there was no minimum pressure requirement for the Reactor vessel, Reactor pressure was reduced to approximately atmospheric, with pressure being automatically controlled by the Turbine Bypass valves.

At 3:28 a.m., the Shutdown Cooling high suction pressure interlock actuated, causing the Shutdown Cooling isolation valves, RHR-MOV-M017 and RHR-MOV-M018, to close. This pressure interlock, set to actuate at a vessel dome pressure at or below 75 psig, protects the piping between the isolation valves and the RHR pump suction. Although the high suction pressure interlock is not actuated by the Group 2 logic (low Reactor water level, high drywell pressure), the reset of the relay utilizes the Group 2 reset switch. After verifying all Reactor parameters were appropriate for the existing conditions, and that the valves fully closed, the Group 2 relay was reset, the isolation valves were reopened, and warming of the RHR system was recommenced at 3:37 a.m. At 5:19 a.m., the high suction pressure interlock actuated a second time, causing the isolation valves to close again. Based on input from Engineering, it was determined that the probable cause of the valve closures was the low pressure existing in the Reactor causing void formation, resulting in spurious actuations of the high suction pressure interlock. Pressure in the vessel was raised, the Group 2 relay was reset, and the isolation valves were reopened. Warming of the RHR system proceeded and Shutdown Cooling was established without further difficulty.

B. Plant Status

The plant was beginning a planned maintenance outage, with the Reactor at approximately atmospheric pressure and a temperature of 240 degrees Fahrenheit in the Reactor Recirculation system. Reactor vessel level was at approximately 48 inches, or 212 inches above the top of active fuel.

C. Basis for Report

Actuation of the Shutdown Cooling isolation valves, part of the Group 2 primary containment isolation. Closure of these valves was due to actuation of the Shutdown Cooling high suction pressure interlock. This event is being reported in accordance with the criteria prescribed by 10CFR50.73(a)(2)(iv).

D. Cause

The most probable cause of these events was void formation and collapse in the RHR lines. Typically, Reactor pressure is 25 - 30 psig when the warming of the RHR system occurs. With water in the piping at or near saturation, depressurization of the Reactor could reduce pressure sufficiently to form voids in the RHR lines. Collapse of the voids would cause a pressure perturbation which would be sensed by the high suction pressure switches. The procedure governing the initiation of Shutdown Cooling did not provide guidance indicating the need to maintain Reactor pressure to ensure voids would not be formed while placing the RHR system in Shutdown Cooling.

E. Safety Significance

The Shutdown Cooling high suction pressure interlock provides overpressure protection for the piping between the Shutdown Cooling isolation valves and the RHR pump suction. The actual setpoint of 72.5 psig ensures that the pressure in the piping remains below the design pressure of 150 psig. As vessel pressure was substantially less than the setpoint, the pressure in the RHR piping did not approach the design conditions. Upon sensing a momentary pressure perturbation, the pressure switches initiated the closure of the valves as designed.

Reactor cooling was being provided by the Condenser through the Turbine Bypass valves, thus the isolation of Shutdown Cooling had no effect on the temperature of the Reactor coolant.

F. Safety Implications

The identified safety function of these valves is to close to protect the suction piping to the RHR pumps from excessive pressure. This function was fulfilled since the valves closed on the spurious high pressure signal. Since additional mechanisms are available to provide the required cooling capability should a high suction pressure actuation occur, and guidance exists to accommodate such isolations, the safety implications associated with this event are minimal.

G. Corrective Action

The pressure in the vessel was increased and the isolation valves opened. Warming of the RHR lines was completed and Shutdown Cooling established without further difficulties. Calibration of the pressure switches was checked and the setpoints were found to be correct. A procedure change has been processed to provide guidance to maintain Reactor pressure to prevent actuation of the pressure interlock while placing Shutdown Cooling in service.

H. Similar Events

None.