COOPER NUCLEAR STATION
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Nebraska Public Power District

NLS960003

January 3, 1996

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Dear Sir:

Cooper Nuclear Station Licensee Event Report 95-021 is forwarded as an attachment to this letter.

Sincerely,

J. T. Herron
Plant Manager

/crm

Attachment

cc: Regional Administrator
USNRC - Region IV

Senior Project Manager
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector
USNRC

NPG Distribution

INPO Records Center

W. Turnbull
MidAmerica Energy

JE22

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
COOPER NUCLEAR STATION	05000298	1 OF 3

TITLE (4)
Spurious Loss of Shutdown Cooling

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
12	09	95	95	-- 021 --	00	01	03	96	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
			20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)	X	50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Chris R. Moeller, Senior Staff Licensing Engineer	(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

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 15 single-spaced typewritten lines) (16)

At 1249 hours on December 9, 1995, the Residual Heat Removal (RHR) Pump A tripped while operating in the Shutdown Cooling (SDC) Mode of RHR due to the SDC suction isolation valves (Group 2 isolation components) automatically closing. The reactor was vented at the time. At 1333 hours, RHR Pump A was restarted in the SDC Mode. During this time, the reactor coolant temperature rose approximately 3 degrees to 121 degrees Fahrenheit.

The cause of this event is Other - Indeterminate (NUREG-1022, Appendix B, Cause Code X). The SDC isolation was most likely caused by a spurious actuation of either SDC Suction High Pressure Switch (RR-PS-128A or RR-PS-128B) or by a momentary loss of the 16A-K28 or 16A-K50 logic relay. The cause of switch actuation or momentary relay loss is indeterminate. Since the cause for the event is indeterminate, no additional corrective actions are planned.

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

PLANT STATUS

Cooper Nuclear Station (CNS) was in cold shutdown for the RE16 refueling outage at the time of the event.

EVENT DESCRIPTION

At 1249 hours on December 9, 1995, the Residual Heat Removal (RHR) Pump A tripped while operating in the Shutdown Cooling (SDC) Mode of RHR due to the SDC suction isolation valves (Group 2 isolation components) automatically closing. The reactor was vented at the time.

At 1333 hours on December 9, RHR Pump A was restarted in the SDC Mode. During this time, the reactor coolant temperature rose approximately 3 degrees to 121 degrees Fahrenheit.

CAUSE

The cause of this event is Other - Indeterminate (NUREG-1022, Appendix B, Cause Code X). Since no other Group 2 isolation indications were observed, the investigation focused on the inputs and circuitry that could initiate an automatic closure of both SDC suction isolation valves, RHR-MOV-MO17 and RHR-MOV-MO18. These valves have only one source of auto-closure: relay 16A-K29 for MO18 and relay 16A-K30 for MO17. If either relay is de-energized its respective valve receives a close signal. Accordingly, any one of the following conditions can cause both relays to simultaneously de-energize:

- SDC Suction High Pressure Switch RR-PS-128A actuation via relay 16A-K28
- SDC Suction High Pressure Switch RR-PS-128B actuation via relay 16A-K50
- Failure of the relay 16A-K28 or 16A-K50
- Loss of logic power RPSPP1B or RPSPP1A
- Failure of circuit power fuse 16A-F15 or 16A-F16
- Low reactor water level via 16A-K5A, K5B, K5C, K5D (1 out of 2 taken twice)

The low reactor water level and loss of logic power (RPSPP1B or RPSPP1A) were eliminated since coincident isolations and scram signals were not received.

Since relays 16A-K28 and 16A-K50 were both found to be energized immediately following the event, circuit power fuse and relay failure were eliminated as probable causes. However, the possibility of a momentary loss of relay 16A-K28 or 16A-K50 could not be ruled out. Through discussions with Operations personnel, it was determined that an electrical lead was in the process of being lifted in the Control Room in support of unrelated testing at the time of the isolation. Neither the operator lifting the lead nor the concurrent verifier noted any arcing or sparking as they started the work. A review of the circuit being worked, and those affected by adjacent leads, showed no connection to the SDC isolation circuitry.

While no pressure spike was recorded, several actions were taken to investigate the SDC suction high pressure switches. These efforts focused on switch integrity and calibration, non-condensable gases, and bumping or jarring of the switches or sensing lines.

To address switch integrity and calibration, a troubleshooting instruction was generated to inspect contact and terminal box lug tightness, and to check for signs of corrosion, fluid leakage, or moisture. No discrepancies were found. Further, a calibration and functional procedure was successfully completed on the switches. These actions eliminated switch integrity and calibration as possible causes.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL	REVISION	
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

While non-condensable gasses in sensing lines can cause pressure spikes, it is unlikely that a bubble could cause a spike of sufficient magnitude (over 80 psi) to cause switch actuation. Additionally, it is unlikely that a bubble of significant size existed as the system had been in service and vented to atmosphere for approximately two weeks. For these reasons, non-condensable gasses were eliminated as a probable cause for the isolation.

To assess the possibility of bumping or jarring the switches or sensing lines as a cause for the isolation, activities in progress in the reactor building and drywell were investigated. While tag-outs had been performed on the instrument racks containing the SDC suction high pressure switches, this work had been completed well before the isolation occurred. While there was no other work being performed on or near the instrument racks, an overall drywell cleanup effort was ongoing at the time. Specifically, scaffolding was being removed from the drywell. When the removal route was retraced, it was determined the sensing line for RR-PS-128A was directly in the path used. Although care had been taken to not impact drywell equipment, it is possible that the sensing line may have been bumped. To determine the magnitude of impact required to activate the switch, the switch manufacturer was contacted. Through these discussions, it was determined that a significant impact would be required to cause switch actuation; however, given the sensing line configuration and distance from the switch, actuation would be very unlikely. Nevertheless, a visual inspection of the sensing line was performed for physical damage. Since no damage was found, it was concluded that the transient was not caused by scaffolding impact to the sensing lines.

In conclusion, the SDC isolation was most likely caused by a spurious actuation of either SDC Suction High Pressure Switch (RR-PS-128A or RR-PS-128B) or by a momentary loss of the 16A-K28 or 16A-K50 logic relay. The cause of switch actuation or momentary relay loss is indeterminate.

SAFETY SIGNIFICANCE

The safety significance of this event is minimal. At the time of the isolation, the reactor had been shutdown over 55 days for refueling. With decay heat greatly reduced, a significant portion of the core replaced with unirradiated fuel, and the coolant temperature comparatively low (118 degrees Fahrenheit), the heat load was minimal and time to boiling fairly long. (While procedurally established curves conservatively estimated time to boiling to be 4 hours, actual time to boiling based on observed data would have been closer to 24 to 30 hours.) Recovery of SDC was accomplished in 44 minutes after a thorough investigation of the cause. During this time, the reactor coolant temperature rose approximately 3 degrees to 121 degrees Fahrenheit. Had a significantly higher heat load been present, SDC could have been immediately returned to service.

CORRECTIVE ACTIONS

Immediate actions were taken to investigate the cause for the isolation and to return SDC to service. Since the cause for the event is indeterminate, no additional corrective actions are planned.

PREVIOUS EVENTS

While previous loss of SDC events have been reported, none have been attributed to spurious actuations of indeterminate cause.

Correspondence No: NLS960003

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	