

Nebraska Public Power District

COOPER NUCLEAR STATION
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NLS950215

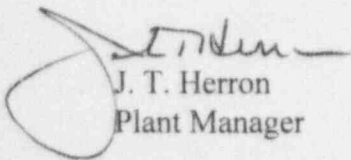
November 13, 1995

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

Dear Sir:

Cooper Nuclear Station Licensee Event Report 95-012 is forwarded as an attachment to this letter.

Sincerely,



J. T. Herron
Plant Manager

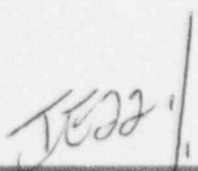
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Attachment

cc: L. J. Callan
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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
A comprehensive review will be performed to address both operational and engineering aspects of the optimum plant configuration and operational methodology for shutting down the plant in a controlled manner. An evaluation will be performed on the RFW operating and abnormal procedures to allow better operation and recovery of RFPs in a broad set of conditions. Procedures will be revised to reflect the results of these reviews.	March 15, 1996
The limitations of simulator and other training experience as the basis for changes in operating procedures will be specified and incorporated into appropriate procedures.	December 18, 1995
The Operations Manager and Supervisor will reinforce to Operations personnel and Operations training personnel command and control expectations for the operating crew in relationship to other personnel in the Control Room.	December 18, 1995

LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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 STATION	DOCKET NUMBER (2) 05000298	PAGE (3) 1 OF 4
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TITLE (4)
RPS Trip Signal and Primary Containment Group Isolations During Shutdown for Refueling Outage

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
10	14	95	95	-- 012	-- 00	11	13	95	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) 22	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)			
	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 Calvin C. Taylor, Licensing and Compliance Specialist	TELEPHONE NUMBER (Include Area Code) (402) 825-3811
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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 0124 CDT, on October 14, 1995, Control Room personnel initiated a manual SCRAM from 22% power in accordance with plant procedures to enter a scheduled refueling outage (RE16). All control rods fully inserted. During the subsequent and expected reactor water level shrink and recovery, the Licensed Operator monitoring reactor level and feed water flow noted that the Reactor Feed Pump turbine's speed was at critical speed and took manual control. He reduced the station controller output, causing a lockout with the feed pumps at minimum speed. The lockout resulted in reduced feed to the vessel and Group 2, 3, and 6 Primary Containment isolations occurred due to low level at 0135. The RPS trip was not reset from the manual SCRAM at this time. The Reactor Core Isolation Cooling System (RCIC) was manually initiated and quickly restored reactor vessel water level after the isolations. At 0143, the RPS trip was reset and at 0144 the group isolations were reset. Reactor pressure continued to lower and at 490 psig, the MSIVs were closed to limit cool down. The resulting steam flow transient caused a reactor water level shrink, an RPS trip signal, and the recurrence of the group isolations. Level was restored and the cool down terminated. The RPS trip was reset at 0206 and the group isolations at 0207.

The cause of this event is inappropriate corrective actions from previous similar events (NUREG 1022, Appendix B, Cause Code E, Management/Quality Assurance Deficiency). The corrective actions to prevent recurrence are to evaluate and revise procedures as necessary for the optimum plant configuration when shutting down the reactor and for Reactor Feed Pump recovery, specifying the limitations of simulator and other training experience as the basis for changes in operating procedures, and reinforcing the expectations for the operating crew in relationship to other personnel in the control room.

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TEXT CONTINUATION

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

PLANT STATUS

A plant shutdown was in progress with the reactor initially at approximately 22 percent power and the turbine generator at 116 MWE. The plant was operating on a single reactor feedwater pump ("B" RFP) with Feedwater (FW) control in automatic with the Master Flow Controller in Balance and flow through RFP Discharge Valve, RF-MO-30.

EVENT DESCRIPTION

At 0124 (CDT) on October 14, 1995, a manual reactor SCRAM [EIS Identifier - JC] was performed from approximately 22% power as part of the planned shutdown commencing refueling outage 16 (RE16). At the time of the scram, turbine load was approximately 116 MWe and the plant was operating on a single RFP with the RFP turbine control [JK] in automatic. Following this planned scram, reactor vessel level exhibited an expected shrink. Recovery from the shrink was faster than what was expected by the operator monitoring and controlling feedwater (FW) [SJ]. Subsequent evaluation shows that the RFP would have tripped on high reactor water level if no operator action were taken.

Control of the RFP turbine speed is provided by a Lovejoy Controls Corporation speed control system. Normal flow control is from a 10-50 milliampere d-c signal from the FW control system [JB]. A Turbine Driven Reactor Feedwater Pump (TDRFP) system loss of control signal results in clamping the speed of the TDRFP. A current sensing (GE/MAC) relay (type 560) senses loss of signal (10-50 mA) and provides a contact to the turbine speed controller for achieving this speed clamping feature, "track and hold."

The FW operator took manual control of the RFP due to indication of the turbine being at critical speed. He reduced the controller output to <6 mA which caused a "track and hold" signal that resulted in the RFP providing insufficient flow to maintain reactor vessel water level. Subsequent efforts to restore the FW flow using a station abnormal operating procedure (AOP) were unsuccessful because the AOP did not address this specific condition. Concurrent with the FW flow recovery effort, operations prepared to use the Reactor Core Isolation Cooling System (RCIC) [BN] to provide makeup flow to the vessel.

RCIC was available to supply water to the reactor vessel in sufficient time to avoid the group isolations, but operators did not initiate RCIC flow until just prior to reaching the Level 3 setpoint. The delay is attributed to a command and control deficiency. A group containment isolation signal from the Level 3 setpoint was received at 0135. The RPS trip was not reset at this time. RCIC flow immediately reestablished the level following the group isolation.

The RPS trip was reset at 0143 and the group isolations were reset at 0144.

Reactor pressure continued to decrease due to steam loads with a condenser vacuum. Steam loads were isolated during the cool down and at 490 psig the MSIVs were isolated to stay within CNS Technical Specifications cool down limits. The resulting shrink in reactor vessel water level caused a Level 3 setpoint actuation, Group 2, 3, and 6 isolation, and a RPS trip at 0155. All control rods were inserted with the previous manual SCRAM actuation.

Level was again raised using RCIC, the cool down was terminated, the RPS trip was reset at 0206, and the group isolations were reset at 0207.

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

CAUSE

The root cause for this event is inappropriate corrective actions from previous similar events due to a failure of the corrective action program (NUREG 1022, Appendix B, Cause Code E, Management/Quality Assurance Deficiency). Corrective actions were identified in previous related LERs but were narrow in scope, concentrating on the specific conditions at the time of the events. A comprehensive evaluation and review of the best method for performing a shutdown from power including a manual SCRAM was never conducted. This review would have included FW system line up, removal of the turbine from service, the power level at which to manually SCRAM, and other variables unique to each situation.

While this event differs from the previous events since 1986, (excluding LER 87-011), in that the initial shrink did not result in the low level ESF actuation, it is similar in that not having established the least disruptive shutdown method caused the circumstances which resulted in the group isolations. Also, previous events had identified that a problem existed with having the bypass valve strainer drain valves open but was not addressed prior to this event.

Strongly contributing to the event were command and control problems, and the over reliance on simulator applications. The procedural revision to allow the use of the feedwater valves was technically validated through simulator experience. The operating crew that shut down the plant had trained on the simulator and had achieved good results using the feed water valves. Investigation of this event revealed that balance of plant conditions including the bypass valve strainer drain valves being open were not simulated in previous applications.

SAFETY SIGNIFICANCE

This event was not safety significant. The reactor vessel water low level (Level 3) setpoint allows for an early indication and actuation of ESF functions for a major breach of the nuclear system process barrier at power. In this event, level was being closely monitored and RCIC was initiated prior to reaching the Level 3 setpoint on the first actuation. RCIC was also used to immediately restore level after MSIV closure resulted in a shrink and the second Level 3 actuation. The resulting isolations caused no operational concerns regarding nuclear safety. All actuations and isolations occurred as designed.

Cool down limits as specified in the CNS Technical Specifications were not exceeded.

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

CORRECTIVE ACTIONS

Cooper Nuclear Station has implemented a much stronger corrective action program since the past planned shutdown events.

Cooper Nuclear Station will take the following actions to prevent recurrence:

1. A comprehensive review will be performed to address both operational and engineering aspects of the optimum plant configuration and operational methodology for shutting down the plant in a controlled manner. An evaluation will be performed on the RFW operating and abnormal procedures to allow better operation and recovery of RFPs in a broad set of conditions. Procedures will be revised to reflect the results of these reviews.
2. The limitations of simulator and other training experience as the basis for changes in operating procedures will be specified and incorporated into appropriate procedures.
3. The Operations Manager and Supervisor will reinforce to Operations personnel and Operations training personnel command and control expectations for the operating crew in relationship to other personnel in the Control Room.

SIMILAR EVENTS

Numerous CNS LERs (86-022, 88-004, 89-012, 90-002, 92-004, and 92-015) document a planned manual SCRAM from low power resulting in a shrink and subsequent Level 3 trip. This event was not similar in that the initial shrink did not cause a group isolation. The group isolations occurred on the subsequent recovery efforts. An event of Group 2, 3, and 6 isolations due to the above circumstances occurred at CNS on October 4, 1991, and was not reported under 10CFR50.73. The reactor was tripped from 567 MWt with the resulting shrink resulting in a minimum level of 14.7 inches. Prior to the event, a Technical Specification amendment was approved allowing a lowering of the Level 3 setpoint from 12.5 to 4.5 inches. A design change to implement this amendment had not been completed. It is speculated that the event was not reported at the time because of perception that the level shrink and subsequent isolations were part of a preplanned evolution in accordance with NUREG 1022, (i.e., the group isolations resulted from the expected shrink from the preplanned manual reactor SCRAM). Current station practice is to report these events.

LER 87-011 reported a spurious automatic SCRAM that resulted in a group isolation. During the recovery effort, the RFP was lost due to a high level trip and level decreased for a second group isolation before the RFP could be restored or RCIC flow established. For corrective actions the Operations Supervisor discussed the event with Licensed Operators during weekly meetings.