



Nebraska Public Power District

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NLS960181

October 25, 1996

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

Dear Sir:

Cooper Nuclear Station Licensee Event Report 96-008 is forwarded as an attachment to this letter.

Sincerely,

M. F. Peckham
Plant Manager

/wrv

Attachment

cc: Regional Administrator
USNRC - Region IV

Senior Project Manager
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector
USNRC- Cooper Nuclear Station

NPG Distribution

INPO Records Center

W. Turnbull
MidAmerica Energy

JE221

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9611010250 961025
PDR ADOCK 05000298
S PDR

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

TITLE (4)

Scram Discharge Volume High Level RPS Trip Channel Anomaly

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
03	23	96	96	-- 008	-- 00	10	25	96	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)		100	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)		50.73(a)(2)(iv)		<input checked="" type="checkbox"/> 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

William R. Victor, Licensing and Compliance Specialist

TELEPHONE 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
D	AA	SHV	K085	Y					

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 3/23/96 a half scram signal occurred while conducting a calibration and functional test of CRD-LT-231C (South Scram Discharge Volume Division 1 high level trip transmitter). The half scram occurred during transmitter backfilling operations and was caused by a stuck shut instrument lower shutoff valve (CRD-V-93) which had apparently been previously over-torqued. This valve is a Kerotest Model Number 9915R packless metal diaphragm globe valve with a hard seat design. From reviewing industry data, this valve design does not have a significant history of this type of failure.

With one inoperable trip channel, Cooper Nuclear Station (CNS) remained in compliance with the Technical Specifications since only 3 of 4 operable channels per trip system/per Scram Discharge Volume (SDV) for the SDV high level Reactor Protection System (RPS) trip are required to be operable. However, this is inconsistent with a generic licensing basis criterion that the trip function meet single failure criteria under the most degraded operational conditions allowed. Specifically, a single failure could be postulated in concert with the single channel per trip system that is allowed to be out of service that could preclude an SDV high level trip on one SDV. A plant-specific basis for this inconsistency could not be identified.

This event is being reported on a voluntary basis to provide information to the Nuclear Regulatory Commission (NRC) and the industry on these hardware and licensing basis discrepancies, and to docket CNS's commitment to consider the minimum number of operable SDIV high water level RPS trip channels to be 4 of 4 per trip system/per SDV.

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		96	-- 008 --	00	2 OF 4

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

PLANT STATUS

The plant was operating at power with the Reactor Mode Switch [EIIS:HS] in RUN at the time of discovery.

EVENT DESCRIPTION

On 3/23/96, CRD-LT-231C (South Scram Discharge Volume Division 1 high level trip transmitter) [LT] was declared inoperable as a result of failure to pass its quarterly functional test. It was determined during troubleshooting that CRD-V-93 (instrument lower shutoff valve) [SHV] was stuck shut. CRD-V-93 is a Kerotest model 9915R packless metal diaphragm globe valve that is designed for zero-leakage. This is accomplished by a resilient metal diaphragm that separates the valve stem from the disc. Closing the valve impinges the stem on the diaphragm which in turn operates against spring pressure on the valve disc to seat the valve. Opening the valve removes the stem impingement, whereupon spring pressure unseats the valve disc, and drives it into the diaphragm, restoring its shape. Apparently, during an earlier cycling of this instrument valve, it was over-torqued such that when reopened the spring force could not overcome the seating force. This Kerotest valve model has a hard seating design which is less prone to this type of failure as similar models with soft seat designs. While not reportable under 10CFR50.73, this event was felt to be of generic industry interest since few similar failures of this model type were found in either NPRDS or INPO Records Center industry databases.

CNS declared the associated SDV high level trip channel inoperable and assessed the resulting operational implications. CNS Technical Specifications allow one instrument channel per trip system to be inoperable without entering an ACTION STATEMENT. However, this allowance appeared to be less stringent than both the analogous Limiting Condition for Operation (LCO) in the NUREG-1433 Standard Technical Specifications and with other RPS trip functions in the CNS Technical Specifications, and warranted further research.

The two SDVs have associated Scram Discharge Instrument Volumes (SDIVs). Each SDIV contains 5 level instruments:

South SDIV

LS-231A (Div. I RPS) [71]
 LS-231B (Div. II RPS) [71]
 LT-231C (Div. I RPS and NORTH SDIV
 NOT DRAINED annunciator)
 LT-231D (Div. II RPS and NORTH SDIV
 NOT DRAINED annunciator) [LT]
 LS-231E (Rod Block) [LS]

North SDIV

LS-234A (Div. I RPS) [71]
 LS-234B (Div. II RPS) [71]
 LT-234C (Div. I RPS and SOUTH SDIV
 NOT DRAINED annunciator) [LT]
 LT-234D (Div. II RPS and SOUTH SDIV
 NOT DRAINED annunciator) [LT]
 LS-234E (Rod Block) [LS]

Consistent with the RPS system design basis, the logic for the high SDV level trip is one-out-of-two taken twice. The SDVs are independent with separate drain lines and isolation valves. Each SDV accommodates approximately half of the scram discharge from the HCUs. Since the reactor will not properly trip if either of the SDVs is non-functional, they must be treated as separate subsystems, each of which must fully meet the applicable licensing basis requirements.

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EVENT DESCRIPTION (continued)

On December 9, 1980, the NRC issued the Generic Safety Evaluation Report for BWR Scram Discharge Systems, written as part of the IE Bulletin 80-17 efforts. Safety Criterion 1 from this SER stated:

No single failure of a component, or service function shall prevent a reactor scram, under the most degraded conditions that are operationally acceptable.

CNS Technical Specification 3.1, Table 3.1.1, requires 3 operable channels per trip system, which is further explained in Note 18 as 3 level instruments per SDIV and 3 level devices per RPS channel. However, it is apparent that the single failure criteria for an individual SDIV cannot be met if one divisional instrument is out of service (as allowed by the Technical Specifications) and the other same-division instrument is the assumed single failure for that SDIV.

SAFETY SIGNIFICANCE

The valve failure appears to be an isolated event since CNS has not had a history of this type of failure before, and since the other applications of this valve model in the plant were verified to be open. Accordingly, the safety significance of the valve hardware failure is considered to be low.

With regard to the licensing basis ambiguity, compliance with the existing CNS Technical Specification for minimum SDV high level channels per trip system is also of minimal safety significance. Deterministically, the event being postulated is not analyzed as part of the Updated Safety Analysis Report Chapter 14 accident analysis (a transient that causes a scram concurrent with an undetected mispositioning of an SDV drain valve and a single failure of the remaining divisional RPS level instrument), although Anticipated Transient Without Scram (ATWS) is part of the plant's overall licensing basis. Probabilistically, the core damage risk is low due to the following factors: 1) the low frequencies per reactor year that an SDIV RPS level device is taken out of service, 2) the frequency of surveillances that ensure SDV drain valve operability and proper positioning and 3) the low occurrence of transients per year that cause an RPS trip. Additionally, the mitigation of an ATWS is controlled by Emergency Operating Procedures which are sufficient to bring the plant to cold shutdown.

CAUSE

The cause of the valve failure has been attributed to a prior occasion when the valve could have been overtorqued while being closed in order to achieve zero leakage on the downstream instrument line. Since this was not a previously recognized failure mechanism for this type of valve, the procedural guidance and training for the Instrument and Control (I&C) technicians were not sufficient to preclude or detect this occurrence.

The cause of the licensing basis inconsistency could not be conclusively determined. On 11/24/82, CNS proposed changes to CNS Technical Specification Table 3.1.1 which reflected upgrades to the SDV High Water Level trip pursuant to IE Bulletin 80-17 resolution.

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CAUSE (continued)

On 4/29/83, the NRC issued Amendment 82 that incorporated the proposed change. However, neither the associated Safety Evaluation Report nor other written records clearly documented the basis for acceptability in allowing only 3 of 4 trip channels to be operable.

CORRECTIVE ACTION

The following corrective actions have been taken:

- A Special Instruction was performed which succeeded in opening CRD-V-93, allowing the restoration of channel operability. Station procedures that involve operating Kerotest model 9915R valves have been changed to provide precautions to prevent over-torquing. Training has been provided to Operations and I&C personnel on the internal configuration of this type of valve and the proper way to manipulate it without loss of function.
- A Nuclear Network notification was made to alert other licensees of the SDV licensing basis anomaly.

Until CNS completes the conversion to the Improved Standard Technical Specifications (which will resolve the apparent non-conservatism in the LCO for SDV high level RPS trip), administrative controls will be maintained to ensure that the minimum number of operable SDV high water level RPS trip channels is 4 of 4 per trip system/per SDV (otherwise the applicable Note in Table 3.1.1 will be followed).

SIMILAR EVENTS

None

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.

[illegible]