Nebraska Public Power District

COOPER NUCLEAR STATION
P.O. BOX 98, BROWNVILLE, NEBRASKA 68321
TELEPHONE (402)825-3811
FAX (402)825-5205

NLS960164

August 23, 1996

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

Dear Sir:

Cooper Nuclear Station Licensee Event Report 96-010 is forwarded as an attachment to this letter.

Sincerely,

J. T. Herron
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

IE22

270160

NRC FORM 366 (4-95)

U.S. NUCLEAR REGULATORY COMMISSION
EXPIRES 04/30/98

OMB NO. 3150-0104

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.

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)

Previous Unavailability of the Muffler Bypass Valve on #2 Emergency Diesel Generator Due to Bowing in Actuator Shaft.

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
07	24	96	96	-- 010 --	00	08	23	96	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)	X	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)		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)
William R. Victor, Licensing and Compliance Specialist	(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
B	EK	XCV	A180	Y						

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)

On July 24, 1996, it was established that a prior in-service testing failure (on 7/1/96) of DG-AOV-MB2 (#2 Emergency Diesel Generator (EDG2) Muffler Bypass Valve) was due principally to a bowed actuator shaft. The test had been performed after a sustained period of EDG2 operation where elevated temperatures accentuated the bowing beyond the torque available to stroke the valve. The functionality of DG-AOV-MB2 under both hot and cold conditions is required for EDG operability. The determination of these causes provided evidence that this Muffler Bypass Valve had not been fully functional for a period of time in excess of the Limiting Condition for Operation (LCO) for EDG2 in the Cooper Nuclear Station (CNS) Technical Specifications. DG-AOV-MB1 (EDG1 Muffler Bypass Valve) was verified to be unaffected by this non-conformance.

The cause of this condition could not be established with certainty. However, the actuator shaft bowing most likely occurred during its fabrication. The valve had been classified and maintained by CNS as non-safety-related, but was later upgraded to safety grade through a vendor-supplier's dedication process. DG-AOV-MB2 has been replaced and its functionality verified under both hot and cold conditions. Additionally, the vendor-supplier has been placed on an expanded Quality Assurance (QA) inspection regimen to verify the continued acceptability of the vendor's dedication program. This failure, along with other unrelated challenges to Muffler Bypass Valve functionality, have called to question the prudence of maintaining the current active design. Accordingly, CNS will normally maintain both valves in the fail-safe open position until a more passive EDG exhaust configuration is implemented.

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL	REVISION	
COOPER NUCLEAR STATION	05000298	96	-- 010 --	00	2 OF 3

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

PLANT STATUS

The plant was at 100% power at the time of discovery.

EVENT DESCRIPTION

On July 1, 1996, an in-service test was performed on DG-AOV-MB2 [EIIS: EK, XCV] to demonstrate its functionality. This test is typically run under cold ambient conditions. However, in this case it was performed after a period of EDG2 operation, which established high temperature equilibrium conditions across the valve due to EDG exhaust gases. Under these particular conditions, DG-AOV-MB2 failed to stroke. The valve was placed in its fail-safe position while investigations continued. On July 24, 1996, it was determined that the failure was due to a slightly bowed actuator shaft of 0.012 inches versus the manufacturer's tolerance of 0.005 inches. This bowing had been exacerbated by the elevated temperatures and by the buildup of corrosion products on the valve bushing. While the valve would properly stroke when cold, excessive torque was needed when hot. Valve testing confirmed that DG-AOV-MB1 (EDG1 Muffler Bypass Valve) was fully functional.

The Muffler Bypass Valves are 30 inch, air-actuated/spring-return, butterfly valves manufactured by the Allis Chalmers Manufacturing Corporation. The functionality of the valves under both hot and cold conditions is required for EDG operability. The valves are normally closed and credited with automatically opening when high EDG backpressure conditions are present from the muffler/silencer exhaust path. Because these normal EDG exhaust lines are not seismically supported, proper operation of the Muffler Bypass Valves could be required during certain seismic or tornadic events. The as-found condition of DG-AOV-MB2 provides evidence that it had not been fully functional for a period of time in excess of the LCO for EDG2 in the CNS Technical Specifications.

SAFETY SIGNIFICANCE

The safety significance of this condition is minimal. This condition was limited to DG-AOV-MB2 and did not affect the operability of EDG1. Additionally, only certain unlikely sequences in a seismic or tornadic occurrence would require DG-AOV-MB2 to function after a period of EDG operation: 1) the Safe Shutdown Earthquake that results in a loss of offsite power but doesn't collapse the normal exhaust line, followed by an aftershock that does, or 2) a tornado that eliminates offsite power and at some later point returns to challenge the unqualified exhaust path. Even assuming the single active failure of the remaining operable diesel, CNS is analyzed for a 4-hour coping time under Station Blackout conditions. This provides an ample period of time for Station personnel to take compensatory actions that would allow for proper operation of EDG2.

CAUSE

The cause of the out-of-tolerance on the actuator shaft could not be established with certainty. However, it most likely occurred during its fabrication. The valve was originally manufactured by Allis-Chalmers. It had been classified and maintained as non-safety-related by CNS, but later dedicated for safety-related use by Cooper Energy Services (CES). When purchased as part of an assembled component, this degree of bowing

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL	REVISION	
COOPER NUCLEAR STATION	05000298	96	-- 010 --	00	3 OF 3

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

CAUSE (continued)

would be a difficult discrepancy to detect without valve disassembly since it was a marginal out-of-tolerance that affected component performance only under certain environmental conditions. CNS believes that this non-conformance is an isolated condition based on the verification of proper performance of DG-AOV-MB1, the satisfactory testing DG-AOV-MB2 under hot and cold conditions following its recent replacement, and based on the lack of other similar occurrences in the industry with this particular valve manufacturer.

CORRECTIVE ACTION

Upon discovery of the problem, both DG-AOV-MB2 and DG-AOV-MB1 were placed in their fail safe (open) position. DG-AOV-MB2 has been replaced and verified to be fully functional. Pending the resolution of unresolved concerns for the CES commercial grade dedication program, a 100% source inspection protocol has been put in effect to ensure CNS QA observation of their dedication activities.

This failure, along with other unrelated challenges to Muffler Bypass Valve functionality, has caused CNS to reassess the prudence of continued reliance on their active safety function. Accordingly, CNS will replace the current EDG Muffler Bypass Valve configuration with a more passive EDG exhaust design. Until this design change is implemented, the Muffler Bypass Valves will be normally maintained in their fail-safe open position.

SIMILAR EVENTS

LER 96-001R1 Potential Inoperability of Emergency Diesel Generators Due to Unauthorized Modification

Correspondence No: NLS960164

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
CNS will replace the function of the current EDG Muffler Bypass Valve configuration with a more passive EDG exhaust design.	None
The Muffler Bypass Valves will be normally maintained in their fail-safe open position.	Implementation of the EDG exhaust line modification to a passive design.