

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Browns Ferry - Unit 3DOCKET NUMBER (2)
0 5 0 0 0 2 9 6PAGE (3)
1 OF 0 3TITLE (4)
Valve Limitorque Motor Pinion Gear Failures (FCV-73-3) and (FCV-74-12 & 61)EVENT DATE (5)
MONTH DAY YEAR
1 1 2 2 8 4 8 4
LER NUMBER (6)
YEAR SEQUENTIAL NUMBER REVISION NUMBER
0 1 3 0 3 0
REPORT DATE (7)
MONTH DAY YEAR
7 0 9 8 5
OTHER FACILITIES INVOLVED (8)
FACILITY NAMES DOCKET NUMBER(S)
0 5 0 0 0 0
0 5 0 0 0 0OPERATING MODE (9)
N
POWER LEVEL (10)
0 0 1 0
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)
20.402(b) 20.405(c) 50.73(a)(2)(iv) 73.71(b)
20.405(a)(1)(i) 50.38(c)(1) X 50.73(a)(2)(v) 73.71(c)
20.405(a)(1)(ii) 50.38(c)(2) 50.73(a)(2)(vii) OTHER (Specify in Abstract below and in Text, NRC Form 365A)
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)(ix)LICENSEE CONTACT FOR THIS LER (12)
NAME TELEPHONE NUMBER
AREA CODE
Jimmy B. Walker 2 0 5 7 2 9 1 - 2 5 1 3 6COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)
CAUSE SYSTEM COMPONENT MANUFACTURER REPORTABLE TO NPDOS
CAUSE SYSTEM COMPONENT MANUFACTURER REPORTABLE TO NPDOSSUPPLEMENTAL 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 fifteen single space typewritten lines) (16)

During startup after cycle 5 refueling outage, the high pressure coolant injection (HPCI) outboard steam supply isolation valve would not open. This made the HPCI system inoperable. All Technical Specification (TS) requirements for redundant systems were met. The valve would not open due to the motor pinion gear being installed backwards.

The valve motor pinion and mating worm shaft gears were replaced in the proper direction. A random sample of similar valves was inspected.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Browns Ferry - Unit 3	0 5 0 0 0 2 9 6	8 4	- 0 1 3	- 0 3	0 2	OF	0 3

TEXT (If more space is required, use additional NRC Form 368A's) (17)

Unit 1 was operating at 74 percent power, unit 2 was in a refueling outage, and unit 3 in the startup mode at 138 psig. Only unit 3 was affected by this event. But in addition, units 1 and 2 valves were randomly sampled to ensure no problems were present.

On November 22, 1984, at 2130, the High Pressure Coolant Injection (HPCI) (BJ) System was being realigned to the standby readiness condition after reaching a pressure consistent with reset of the HPCI low pressure isolation. HPCI outboard flow control valve (FCV) 73-3 could not be opened electrically, and the HPCI system was declared inoperable.

FCV 73-3 is a 10-inch gate valve which is manufactured by Crane. The limitorque valve operator was disassembled and visually inspected for damage. Inspection determined that the motor pinion gear (GR) was installed backwards during previous maintenance work. When the gear was installed backwards, full engagement of mating gears was not maintained. This caused additional loading of the outer portion of the motor pinion gear teeth which in turn caused some of the teeth to break which allowed the motor to spin without engaging the limitorque operator. The motor pinion gear and mating worm gears were replaced with new gears in the proper direction.

Also, the cable from the power supply to motor shunt field was found to be open. The open cable caused FCV-73-3 to operate in approximately 8 seconds since the motor operates as a series DC motor with the shunt field open. The cable was repaired and the valve then operated in approximately 16 seconds. The maximum stroke time for this valve is 20 seconds.

FCV 73-3 failed in the closed position. Primary containment isolation was maintained by the inboard isolation valve, but the inoperable outboard valve rendered the high pressure coolant injection system inoperable. All technical specification requirements were complied with.

A 20 percent random sample of all accessible emergency core cooling system valves have been inspected on all units. A total of 36 valves were inspected and all of the valves motor pinion gears were found to be installed in the proper arrangement.

During the inspection of the 36 valves for motor pinion gear problem, the motor pinion gear setscrew on 2FCV 73-34 was found to be loose and 3FCV 73-16 was found to have missing split ring parts as described in LER 296/84014. As a result of these findings the valves were inspected for gear condition, setscrew tightness, worm gear retainer, split ring and snap ring installation. Two valves were found to have loose setscrews, and four valves had missing setscrew wires. The manufacturer indicated that the loose setscrew or missing setscrew wires would not cause a valve failure.

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APPROVED OMB NO. 3150-0104

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

The preventative and corrective maintenance instruction has been revised to inspect all CSSC SMB-1 through 4 operators for all these identified problems. All applicable maintenance personnel have been trained and made aware of these problems and the revisions made to the maintenance instruction.

The following is in addition to the information given in revision 1 as a continuing effort to identify all motor pinion gear problems.

During the performance of a surveillance instruction (motor operability valve test) on March 13, 1985, on residual heat removal (RHR) valve 3FCV-74-12 (loop I RHR), it was determined that the valve would not operate. The valve was inspected, and the motor pinion gear was found to be installed backwards. The motor pinion gear setscrew was also found to be loose which allowed sufficient clearance between motor pinion and mating worm shaft clutch gear to completely disengage with each other. A new motor pinion gear was installed in the proper orientation.

On March 18, 1985, during an inspection of limitorque operator for proper motor pinion gear orientation, valve 3FCV-74-61 (loop I RHR containment spray injection valve) was found to have damage to both the motor pinion gear and worm shaft clutch gear. Teeth were missing from both gears and the worm shaft clutch gear hub was cracked. The gears were oriented properly, and the valve had been cycled satisfactorily prior to the inspection. It appeared that one or more teeth broke off and lodged between the remaining gear teeth causing more teeth to break. The inspection caught the problem before the valve actually failed.

Based on these findings the scope of the inspection has been expanded to all emergency core cooling systems with limitorque operator sizes SMB-1 through 4. valves.

Responsible Plant Section - MM

Previous Similar Events - BFRO 50-259/79035; BFRO 50-260/80002

TENNESSEE VALLEY AUTHORITY

Browns Ferry Nuclear Plant
P. O. Box 2000
Decatur, Alabama 35602

July 9, 1985

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

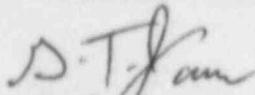
Dear Sir:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 3 -
DOCKET NO. 50-296 - FACILITY OPERATING LICENSE DPR-68 - REPORTABLE
OCCURRENCE REPORT BFRO-50-296/84013 R3

The enclosed report provides additional details concerning the latest
inspection boundaries of the valve limitorque motor pinion gear failures.
This report is submitted in accordance with 10 CFR 50.73(a)(2)(v).

Very truly yours,

TENNESSEE VALLEY AUTHORITY



G. T. Jones
Plant Manager
Browns Ferry Nuclear Plant

Enclosures

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