

Younger
Heater

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE
37401



February 26, 1974

Mr. Donald F. Knuth, Director
Directorate of Regulatory Operations
U.S. Atomic Energy Commission
Washington, DC 20545

Dear Mr. Knuth:

Initial report of a deficiency involving FCV-74-73 in Browns Ferry Nuclear Plant unit 2 was made on December 22, 1973. An interim report, J. E. Gilleland to D. F. Knuth, was submitted on January 23, 1974. In summary, during Preoperational Test No. G-31, the operator mechanism of FCV-74-73 in the Residual Heat Removal System failed mechanically. The failure was apparently caused by the lock nut's failure to secure the stem nut which allowed the stem nut to travel without actuating the valve. The lock nut should have been double-staked to the drive sleeve at the factory, but on this particular valve the double-staking apparently was not done adequately. We have taken the corrective action described in the enclosure which is submitted as the final deficiency report in accordance with paragraph 50.55(e) of 10 CFR 50.

Very truly yours,

J. E. Gilleland
Assistant to the Manager of Power

Enclosure

CC (Enclosure):

Mr. Norman C. Moseley, Director
Directorate of Regulatory Operations
U.S. Atomic Energy Commission
Region II - Suite 818
230 Peachtree Street, NW.
Atlanta, Georgia 30303

8311080284 740320
PDR ADOCK 05000260
S PDR

Handwritten:
50-260

3 1467

ENCLOSURE

BROWNS FERRY NUCLEAR PLANT UNIT 2 FAILURE OF OPERATOR FOR VALVE FCV-74-73 IN THE RHRS SYSTEM FINAL REPORT

On December 22, 1973, an initial report was made to AEC-DRO Inspector W. S. Little of the failure of the operator for valve FCV-74-73 in the Residual Heat Removal System (RHRS). This report was made via a telecon by C. S. Walker, D. R. Magnuson, A. L. Mazzetti, and L. D. Weber in compliance with paragraph 50.55(e) of 10CFR50. An interim report was submitted on January 23, 1974. This is the final report for the occurrence.

Description of the Associated Plant Equipment

The subject valve-operator assembly is located in the RHRS in unit 2 of the Browns Ferry Nuclear Plant. The assembly is situated in the 12-in. portion of the 18-in. Recirculation Loop II prior to the entry of this line into the suppression pool through penetration X-210B. The valve is a 12-in. Walworth globe valve with a design pressure and temperature of 450 psig and 350°F, respectively, and a flow rating of 20,000 gpm. Its operator is a LimiTorque type SMB-2 valve control.

Description and Cause of Occurrence

During Preoperational Test No. G-31 in unit 2 of the Browns Ferry plant, the operator mechanism of valve FCV-74-73 in the RHRS failed mechanically. The failure was apparently caused by the locking nut's failure to secure the stem nut which allowed the stem nut to rise up the threaded stem of the valve without actuating the valve. The locking nut is screwed into the drive sleeve in the operator assembly above the stem nut and prevents the stem nut from rising when the valve is closed. The means of securing the stem nut against rotation that had been used was double "staking" the threads on the drive sleeve that mate with the threads of the locking nut. However, this means, as performed, was ineffective in preventing the locking nut from unscrewing from the drive sleeve.

Staking the threads on the drive sleeve is an operation requiring proper technique and judgment. If the staking or scoring of the threads in order to prevent further movement is performed too lightly, the locking nut will not be prevented from unscrewing. If, on the other hand, the staking is done too heavily, disassembling the operator mechanism will require destroying the staked portions of the threads.

Corrective Measures

The immediate corrective measure taken to repair the operator mechanism was to reassemble the mechanism. During this work, special care was taken to adequately stake the threads on the drive sleeve to insure that the locking nut was tightly held in the operator mechanism.

Staking of the threads of the drive sleeve was done as follows:

1. The staking was performed through each of the two wrench holes of the locking nut.
2. The peaks of two adjacent threads and the valley in between were severely deformed by means of a center punch. If there was a doubt as to whether the staking was performed severely enough, it was deemed better to err on the conservative side by carrying out the operation too heavily since it is preferable to destroy the staked portions of the threads when disassembling the operator than to risk autodisassembly.

A Limitorque stem locking nut examination was instituted to provide assurance that the locking nut on each Limitorque operator will be securely crimped or staked in two places. This examination will be performed by a member of the engineering staff at the Browns Ferry site. Records for each individual valve will be kept. Exhibit 1, entitled "Limitorque Stem Locknut Check," is a copy of these records for the examination performed on the Limitorque operators of unit 2 on December 19, 1973.

Although this deficiency is not considered to be generic, a similar staking check will be performed on the Limitorque operators for unit 3 before the respective valves are installed. Such a staking check will also be made on

every Limitorque operator that is reassembled in the future. We believe that such examinations will prevent the recurrence of this problem in the future.