

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE
37401



July 16, 1974

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

Dear Mr. Knuth:

BROWNS FERRY NUCLEAR PLANT UNIT 2 - POTENTIAL DESIGN DEFICIENCIES
INVOLVING THE FUEL HANDLING GRAPPLE AND THE MALFUNCTION OF THE
REFUELING PLATFORM HOIST BRAKE

Initial reports of the subject potential deficiencies were made
on May 16, 1974, and May 23, 1974. An interim report was submitted
in my letter to you dated June 20.

In compliance with paragraph 50.55(e) of 10 CFR Part 50, this is
submitted as the final report of the two potential deficiencies.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'J. E. Gilleland'.

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.
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BROWNS FERRY NUCLEAR PLANT UNIT 2
DEFICIENCIES OF FUEL HANDLING GRAPPLE AND REFUELING
PLATFORM HOIST BRAKE

Final Report

This single report covers two occurrences herein identified as Deficiency 1 and Deficiency 2. On May 16, 1974, an initial report was made regarding the failure of the fuel handling grapple in Unit 2 at the Browns Ferry site (Deficiency 1) to W. S. Little, AEC-DRO Inspector. This report was made by M. Price and E. Hilgeman. On May 23, 1974, an initial report was made concerning the malfunction of the refueling platform hoist brake in Unit 2 at the Browns Ferry site (Deficiency 2) to W. S. Little. This report was also made by M. Price and E. Hilgeman. These two reports were made in compliance with paragraph 50.55(e) of 10CFR50. Our request of May 31, 1974, to W. S. Little to incorporate these deficiencies in the same report was granted. This is the final report for the two occurrences.

Descriptions of Occurrences

Deficiency 1

Following the modification in the FDI 176/87000-1 to stiffen the 12-inch section of the grapple, the 10-inch section became stuck in the 12-inch section. In order to loosen the stuck section, the grapple was jarred while over the reactor vessel. The 10-inch and 7-inch sections of the grapple fell about 15 feet, impacting on the grapple stops. Some of the grapple stops broke loose and fell into the reactor vessel. No damage to the reactor vessel occurred for two reasons. First, the falling parts fell into the water contained in the reactor vessel and did not fall directly onto the surface of the reactor vessel. Second, no damage to the reactor vessel would have occurred because the falling pieces were too small to cause impact damage. The parts that fell into the reactor vessel were retrieved.

Deficiency 2

The electro-mechanical brake on the refueling platform main hoist motor was found to be inoperative.

Causes of Deficiencies

Deficiency 1

Failure of the fuel handling grapple occurred when an attempt to loosen the stuck section was made by jarring the grapple over the reactor vessel. The failure was initiated by inadequate clearances between the moving parts of the grapple.

Deficiency 2

An investigation of the inoperative brake revealed that the electric power leads to the electro-mechanical brake coil were pinched in a conduit fitting. The pinched leads short-circuited to the conduit fitting. The coil was not damaged.

Safety Implications

Deficiency 1

Safety implications related to failure of the fuel handling grapple are similar to those of the design basis accident for the refueling accident wherein a fuel assembly is dropped onto the reactor core. The result of this accident is described in Section 14.6.4 of the FSAR. The assumptions used in the design basis accident are:

1. The fuel assembly is dropped from the maximum height allowed by the fuel handling equipment.
2. The entire amount of potential energy, referenced to the top of the reactor core, is available for application to the fuel assemblies involved in the accident.

3. None of the energy associated with the dropped fuel assembly is absorbed by the fuel material (uranium dioxide).

It was concluded that this postulated accident would not result in any radiological exposures which would endanger the health and safety of the public.

Deficiency 2

The malfunction of the main hoist motor brake was not safety-related because the failure immobilized the refueling platform in a safe position. In this condition, the refueling platform could not be moved until the brake was released. However, release of the brake was not possible as long as its power source was short-circuited.

Corrective Measures

Deficiency 1

The grapple was rebuilt using parts supplied by the General Electric Company and using sections taken from the Unit 3 grapple. These measures were completed prior to June 7, 1974. After these measures were taken, the grapple functioned satisfactorily.

Deficiency 2

The power leads were rewired and the electro-mechanical brake was retested on May 24, 1974. It functioned satisfactorily.

Means Taken to Prevent a Recurrence of the Deficiencies

Deficiency 1

A revision has been made to the FDI (modification instruction) to assure adequate clearances and performance testing after modifying the grapple.

Deficiency 2

Failure of the brake to release can not initiate an unsafe condition. Normal electrical construction should prevent such occurrences, thus no special action is required to prevent recurrence of this deficiency.