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December 8, 1975



Director of Nuclear Reactor Regulation
Attn: Mr. Dennis L. Ziemann, Chief
Operating Reactors - Branch 2
Division of Reactor Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3
Quad-Cities Station Units 1 and 2
Supplement to Dresden Special Report No. 16 and Quad-Cities Special Report No. 16, "Reactor Building Crane and Cask Yoke Assembly Modifications"
NRC Docket Nos. 50-237, 50-249
50-254, and 50-265



Dear Mr. Ziemann:

In response to your letter of October 16, 1975, the following additional information is submitted. This information is again keyed to the numbering system in the Branch Technical Position.

1.b. As was defined in Section 3.3.B.2 of the subject special reports, a 12.5% static load test of the new hoist system will be conducted. Inasmuch as these cranes are located indoors in a heated, controlled environment, conducting the test at the minimum crane operating temperature is impractical. Moreover, the design and construction of these hoisting systems are such that it is not expected that any load bearing weld will exceed 50% of the American Welding Society's allowable stresses. This contention is supported by the factors of safety for major structural components reported in Attachment 1 of our first supplement to the subject Special Reports. For these reasons, further nondestructive examination of weldments subsequent to the load test are unnecessary.

1.e. An evaluation of crane fatigue life will be provided as soon as it is completed. A simplified analysis in Attachment 2 of our first supplement to the subject Special Reports indicated the extremely low full load duty of these systems. By the C.M.A.A. No. 70 standard, these cranes would be classified as AL, (capable of a minimum of 100,000 cycles at full rated load of 125 tons). These

cranes will most probably see fewer than 5,000 cycles at a maximum of 100 tons, and a larger number of cycles at significantly less than 100 tons. For this reason, fatigue life is not significant to the operation of this equipment.

2.a.1. and 2.a.2. A detailed response will be submitted as soon as it is completed.

2.a.3. The pendant control station is equipped with a two position selector switch (CAB-Floor) with maintained contacts. The operator selects either the cab or floor operation and precludes operation from the other position. Failure of the switch by a "short circuit" between the selector contacts would make operation from both cab and floor positions possible.

2.a.4. The main/auxiliary hoist selector switch is a two position, maintained contact selector switch which precludes simultaneous operation of the main and auxiliary hoists. In addition, the transfer relays (main auxiliary) are interlocked to preclude their simultaneous operation. Failure of the power supply will cause the main and auxiliary hoists controls to assume the "at rest" state. The normal/restricted path selector switch is also a two position, maintained contact selector switch which precludes operation in both the normal and restricted path modes. In addition, the normal path mode is dependent on auxiliary relays being energized when the normal path is selected. Failure of the power supply will cause the control system to operate in the restricted path mode.

2.a.5. The main hoist control system is powered separately from the bridge and trolley controls. Both control systems have been interlocked with a control relay "RBJ" which is in turn interlocked with the limit switches on the hoist equalizer bar. The limit switches on the hoist equalizer bar energize the relay "RBJ" for the normal mode. When the ropes are out of adjustment, relay "RBJ" is de-energized cutting off power to both the hoist system and the trolley system. The key lock bypass switch only bypasses the "RBJ" relay contact which is interlocked with the bridge and trolley system. Failure of the power supply will cause all the relays to fail in the safe de-energized mode.

3.d. The possibility of a horizontal displacement is being evaluated. The results will be submitted when available. Preliminary estimates indicate that such displacements will not exceed 2 inches at critical points of life and will not affect hoist operation.

3.e. The wire rope to be used on these hoist systems is 1 1/4 inch diameter monitor "AAA" bright super tensile (6 x 37) IPS-IWRC rope, with a breaking strength of 175,800 pounds. This rope is in

compliance with the Branch Technical Position APCSB 9-1.

3.e and f. All inspections required by Section 1910.179 (overhead and gantry crane) of the Occupational Safety and Health Act of 1970 will be performed.

3.j. The crane hoist control system currently incorporates a triple upper limit shutoff consisting of two screw-type switches on the main hoist and one counter weight type switch block actuated. There is also installed a load cell overload sensing device on the main hoist which will stop the hoist motion when the preset maximum load limit is reached. It is concluded that the system is designed with sufficient redundancy to preclude "two blocking".

3.k. This system is equipped with a device which will catch the drum hub after a drop of approximately 1/8 inch, should the drum shaft or drum bearing fail. With this insignificant drop, neither drum gear would come out of mesh. A center failure of the drum is inconceivable as the stress level is extremely low. Even if the drum should yield in the center, it is judged that the high ratio of ultimate stress to design (7.6) provides sufficient justification for not incorporating an additional device to catch the drum. The conservatism of the proposed design makes further complications by adding a drum catching device unwarranted.

3.m. The main hoist holding brakes are provided with manual release. The brakes are General Electric 1C-9528 DC rectifier operated shoe brakes. There are two such brakes on the main hoist. The precision main hoist drive with a hoist speed of approximately 0.5 FPM will, in conjunction with the redundant main hoist holding brakes, satisfy the requirements of the Branch Position.

Additional information in response to Items 1.e, 2.a.1, 2.a.2, and 3.d will be submitted by February 1, 1976.

Please contact this office if you have additional questions.

One (1) signed original and 79 copies are provided for your use.

Very truly yours,

G. A. Abrell
Nuclear Licensing Administrator
Boiling Water Reactors