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MEMORANDUM FOR: Dennis L. Ziemann, Chief, Operating Reactors Branch #2, DOR

FROM: G. Lainas, Chief, Plant Systems Branch, DOR HADDAM NECK - FIRE PROTECTION MODIFICATION SER ITEM 3.1.4(5)

Plant Name: Haddam Neck Licensee: Northeast Utilities Docket No.: 50-213 Responsible Branch: ORB#2 Project Manager: R. Silver Review Branch: Plant Systems Requested Completion Date: January 15, 1980 Status: Complete

During our evaluation of the fire protection suppression systems in the Turbine Building we noted that there was only a single feed from the yard loop to the automatic systems ring header and only a single feed from the automatic systems ring header to the hose stations feed from the automatic systems ring header to the hose stations ing header. Therefore, a break in the underground feed impairs all ring header. Therefore, a break in the underground feed impairs all reas or areas exposing safety-related areas. To provide a more areas or areas exposing safety-related areas. To provide a more feed fire suppression system, an additional feed from the yeard reliable fire suppression system, an additional feed can supply necessary. This arrangement should assure that either feed can supply necessary. This arrangement should assure that either feed in any one the water demand of both the ring header and that a break in any one feed would not result in the simultaneous loss of function of both ring headers.

The licensee agreed to provide the feed is described in SER item 3.1.4 "An additional feed from the yard loop will be provided for the turbine building hose stations which can be isolated to provide a feed independent of automatic water suppression systems in the area (5.11)." Dennis L. Ziemann

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To meet this commitment, the licensee installed a 4-inch feed from the yard loop to the turbine building ring header. This does not satisfy the commitment. The modification provides two feeds, however, the 4 inch feed does not provide adequate capacity for providing maximum water demand of both the hose station and automatic systems ring headers.

The licensee should be advised that the proposed modification is not acceptable. Our consultant's calculation regarding the capacity of the proposed feed is enclosed. We request that a new feed with adequate isolation valving to preclude a single break from affecting both ring headers. This requested modification should be completed prior to a return to power from the 1980 refueling outage. We request the Office of Inspection and Enforcement be notified to provide inspection of this requested modification.

Reguesion

-G. Lainas, Chief Plant Systems Branch Division of Operating Reactors

Contact: L. Derderian, X27690

Enclosure: Letter dtd 12/27/79 -Consultant (BNL)

cc w/enclosure:

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BROOKHAVEN NATIONAL LABORATORY

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Department of Nuclear Energy

December 27, 1979

Mr. Robert L. Ferguson Plant Systems Branch U.S. Nuclear Regulatory Commission Washington, D.C. 20555

Subject: Haddam Neck Fire Protection Review, Item 3.1.4(5).

Dear Bob:

As I stated in my letter to you on December 20, 1979 the four-inch connection irom the service building was inadequate to supply the required water pressure and demand for the turbine building fire protection water in case of a break in the main water feed from the loop.

Attached is a copy of Mr. Antonetti's calculations verifying this fact.

Respectfully yours,

TI E. Frall

Robert E. Hall, Group Leader Reactor Engineering Analysis

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of 8001030658

REH:EAM:sd attachment cc.: R. Cerbone wo/enc. W. Kato wo/enc. V. Panciera wo/enc. . Derderian E. MacDougall

QD



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December 26, 1979 File No. 7722

Brookhaven National Laboratory Associated Universities, Inc. Building No. 130 Upton, Long Island, New York 11973

Attention: Mr. Edward A. MacDougall

RE: Haddam Neck Fire Protection Review Additional Fire Water Feed Turbine Building

Gentlemen:

Reference your letter of December 20, 1979 requesting water requirements for the Turbine Building sprinkler protection at Haddam Neck Nuclear Power Plant.

The fire hazard analysis submitted by the Utility indicates a water demand for the Turbine Building sprinkler system as 2,000 gpm with an additional 900 gpm for the oil receiver and cooler deluge system. The combined demand is 2900 gpm with an approximate pressure of 100 psig as indicated in FHA fire hazard analysis.

Using the 2000 gpm @ 100 psi as the water demand for the sprinkler systems in the turbine building, the friction loss in the 4-inch alternate feed from the Service Building to the turbine manifold sprinkler system is determined by Hazen-Williams Formula:

$$f_1 = \frac{4524 \text{ g}^{1.85}}{c^{1.85} \text{ d}^{4.87}}$$

where G = rate of flow, gpm

C = Hazen-Williams pipe coefficient

d = internal diameter of pipe, inches

f. = loss, psi/1000 ft.

----continued

Brookhaven National Laboratory -2- Dec. 26, 1979

Inserting the appropriate number the formula is

$$f_1 = \frac{4524 (2000)^{1.85}}{(120)^{1.85} (4)^{4.87}}$$

The 4-inch pipe has an equivalent length of pipe of 400 feet. Therefore, the friction loss for 2000 gpm with a C factor of 120 is 386 psi. The fire pumps are rated for 2500 gpm @ 115 psi. These pumps cannot meet the pressure requirements.

In conclusion, the 4-inch alternate feed from the Service Building to the turbine manifold sprinkler systems can not supply the water demand requirements for the turbine building.

If you have any questions, please call me.

Very truly yours,

GAGE-BABCOCK & ASSOCIATES, INC.

Tharer a. antracte.

Mario A. Antonetti, P.E. O

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