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CLASS	UNCLASS	PROP INFO	INPUT	NO CYS REC'D	DOCKET NO:
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DESCRIPTION:

Ltr re our 6-24-75 ltr...trans the following:

PLANT NAME: Nine Mile Point #1

ENCLOSURES:

Addl info concerning proposed modification of the reactor building crane.....

(40 cys encl rec'd)

FOR ACTION/INFORMATION 12-16-75 ehf

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MAY

NIAGARA MOHAWK POWER CORPORATION

NIAGARA MOHAWK

300 ERIE BOULEVARD, WEST
SYRACUSE, N. Y. 13202

December 10, 1975

Director of Nuclear Reactor Regulation
Attn: Mr. Karl R. Goller
Assistant Director for Operating
Reactors
Directorate of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Nine Mile Point Unit 1
Docket No. 50-220

Dear Mr. Goller:

The attached information is provided in response to your June 24, 1974 letter regarding a proposed modification of the Nine Mile Point Unit 1 reactor building crane. This information was discussed at a September 19, 1975 meeting with your staff.

In addition, the cask drop protection system provides reasonable protection against loss of integrity of the fuel pool and against damage to stored spent fuel in the unlikely event a fuel cask were to be dropped into the pool. The modified crane is an operational feature for added safety when handling the spent fuel shipping cask.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

Gerald K. Rhode
Vice President - Engineering

MGM/sz
Attachment

13852

Reactor Building Crane

RESPONSE TO NRC CONCERNS

Background

Our letter of July 26, 1973 described the design of a proposed modification of the Nine Mile Point Unit 1 reactor building crane to provide a redundant hoisting system and crane movement controls. The Commission's letter of June 24, 1974 concluded that the modification would be acceptable, provided that: (1) the trolley and hoist are provided with variable speed controls, and (2) that the rope reeving system, fleet angles and sheave size conform to Paragraph Nos. M.4, M.5 and M.6 of AISE Standard No. 6-1969 for ropes, reeving and sheave sizes. Subsequently, a meeting was held on September 19, 1975 with the Commission to discuss Niagara Mohawk's response to their concerns. The following information is a reply to the June 24, 1975 letter and includes the information presented at the September 19, 1975 meeting.

Variable Speed Controls

Both the trolley and hoist are provided with variable speed controls. The main hoist utilizes a General Electric Max Speed 320 D.C. adjustable voltage controller. The trolley has a five speed control (drift point plus 4 speeds). Movement will be controlled by push button. For both trolley and hoist, the further the button is depressed the faster will be the movement.

Rope Reeving System, Fleet Angles, and Sheave Sizes

The rope reeving system, fleet angles and sheave sizes do not fully conform with AISE Standard No. 6-1969, since the equipment was purchased prior to the requirement to meet this standard. Compliance with Paragraphs Nos. M.4, M.5 and M.6 of the Standard is addressed below.

1. Paragraph M.4 (Ropes)

   a. Applicable Portions of Standard

      "When practical, ropes shall be so reaved as to eliminate reverse bends." Also, "The maximum allowable fleet angle shall be 2-1/2 degrees or approximately 1/2 inch per foot in frequent working positions or up to 3-1/2 degrees in seldom reached positions."

b. Compliance to Standard

The system as shown in Figures 3 and 4 of our July 26, 1973 submittal is required to achieve a redundant system. The frequency of stress reversal is the main cause of rope fatigue. The crane will be used a maximum of 24 times per year to handle the spent fuel cask and once a year to handle the shield plugs and reactor head. This frequency of use will cause minimal rope fatigue. Since the rope will be frequently inspected for any detrimental effects caused by fatigue, it is considered worthwhile to have this reeving system to achieve redundancy.

The maximum fleet angle with crane hook at the design high point is 4.81 degrees. The high point of the hook to handle the heaviest and longest spent fuel cask is approximately three feet lower than design high point. Limit switches control this high point. The maximum fleet angle when handling the cask at this high point is 3.5 degrees. At this elevation, the fleet angle of drum to first sheave would be 2.2 degrees. The 3.5 and 2.2 degree fleet angles would be approximately the same when removing the reactor shield plugs. The low point of the hook to handle a spent fuel cask is approximately 15 feet higher than the design low point. The maximum fleet angle of drum to sheave would be 3.8 degrees. The drum grooves are machined and have a smooth wearing surface.

2. Paragraph M.5 (Equalizer Bar or Sheaves)

a. Applicable Portions of Standard

"Where required, either an equalizer bar or sheave will be acceptable. In either case, it shall be so designed as to be accessible from the floor of the trolley and made in such a manner that it can turn or swivel to align itself with the pull of the ropes. Equalizer sheaves when used shall have a pitch diameter not less than 18 times the diameter of the rope."

b. Compliance to Standard

The Nine Mile Point Unit 1 crane has an equalizer bar assembly. It is accessible from the floor of the trolley. It does not swivel. The crane will not be used for side pull and the load will have very little swing.

3. Paragraph M.6 (Sheaves and Hook Blocks)

a. Applicable Portions of Standard

"Sheaves shall be provided with anti-friction bearings. Proper provisions to take care of thrust shall be made. The sheaves shall be used in standard sizes in accordance with Figure M.6.A." Also, "The pitch diameter of all sheaves, except equalizer sheaves, shall not be less than 30 times the diameter of the rope used for 6 x 37 rope. Use the next larger size (diameter and groove) for lead sheaves. Sheaves shall be enclosed by guards which fit close to the flanges so as to prevent the ropes from coming out of the grooves." Also, "Each sheave shall be lubricated by an individual grease line, the fittings to be located so that they will be protected from damage."

b. Compliance to Standard

The upper sheaves have anti-friction bearing and thrust bearings. The lower sheaves have bronzoid combination sheave bearings and thrust bearings with special lubricant. The lower block is built this way so that it can be immersed in water. The lower block has two 33 inch, two 30 inch and four 27 inch diameter sheaves. The upper sheaves are four 33 inch and two 41 inch diameter sheaves. The wire rope is 1-1/8 inch diameter (6 strand, 37 wire).

This crane was designed for a minimum sheave diameter of 24 times rope diameter. This ratio of sheave to rope diameter will give more than adequate fatigue life for the expected crane service frequency.

Grease fittings are provided for periodic greasing of sheave bearings.

The installation and testing for the redundant crane is scheduled for February through April, 1976. The crane will be inspected, tested and maintained in accordance with ANSI B30.2.0-1967, Chapter 2-2. No cask handling activities are currently planned until installation of the redundant hoisting system and crane movement controls are completed.

In conclusion, the installation of the redundant crane systems and crane movement controls, in conjunction with the cask drop protection system, provide an effective system of protection against cask drop accidents. Although the reactor building crane will not fully comply to AISE Standard No. 6-1969, the proposed redundant rope system as compared to the existing single rope system is superior.