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DOCTYPE: LETTER
SUBJECT: NOTARIZED: YES

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FURNISHING APPL FOR AMEND FOR APPLICANT'S SUBMITTAL OF 10/13/77 WHICH
FORWARDED REPT ENTITLED "DESIGN AND SAFETY EVALUATION FOR REPLACEMENT OF
SPENT FUEL POOL STORAGE RACKS" AND ADDL INFO PROVIDED BY SUBMITTALS DTD
12/20/77, 03/14, 05/11 05/15, 06/06 AND 6/9/78

PLANT NAME: DUANE ARNOLD

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IOWA ELECTRIC LIGHT AND POWER COMPANY

General Office
CEDAR RAPIDS, IOWA

LEE LIU
VICE PRESIDENT - ENGINEERING

June 29, 1978
IE-78-985

U.S. NRC
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Mr. Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Case:

Our submittal of October 13, 1977, forwarded a report entitled, "Design and Safety Evaluation for Replacement of Spent Fuel Pool Storage Racks." Additional information was provided by submittals dated December 20, 1977, March 14, May 11, May 15, June 6 and June 19, 1978. Transmitted herewith is an application for amendment of the previous submittals (hereinafter collectively referred to as the "DAEC submittal").

This amendment to the DAEC submittal describes the temporary installation of two 8 x 10 spent fuel storage racks manufactured for Boston Edison's Pilgrim I plant in the Duane Arnold Energy Center (DAEC) spent fuel pool. The temporary installation of these racks is necessary to allow the discharge of all fuel from the reactor to facilitate repairs to the recirculation riser nozzle safe end. All conditions in the previous submittals apply to this amendment.

The temporary racks are of the Programmed & Remote Systems Corporation standard design for storing General Electric fuel and, except as noted below, are of the same design as the racks proposed for permanent installation in the DAEC submittal. The two racks will be placed in open areas in the fuel pool as shown in Figure 1. The temporary racks will have no effect on the existing racks in the pool nor will the existing racks affect the two temporary racks. No alterations to existing racks will be made. We have evaluated the effects of the physical differences upon the analyses results as reported in our application.

781810271

Approved
5/3/40

The current unused DAEC normal storage capacity is 206 bundles. The core offload, of 368 bundles, requires 162 additional storage locations. This amendment proposes the use of two 8 x 10 temporary racks for 160 additional locations. Two bundles will be stored in the fuel preparation machines.

The construction features and materials used in the temporary racks are essentially the same as the DAEC racks described in the DAEC submittal. The dimensional differences include the fuel spacing, the rack height, and the dimensions of the Boral poison sheets. The fuel spacing is $3/8$ inches greater in the temporary racks, being 7 inches center to center as compared to $6-5/8$ inches for the DAEC racks. The temporary racks are 5.5 inches shorter, due to the longer overall length of fuel at the DAEC. This does not affect the location of the active portion of the fuel relative to the poison plates, except that the plates will extend 0.8 inches below and 1.2 inches above the active section of the fuel, as compared to 1.0 inches both above and below in the DAEC racks. In addition, the Boral plates in the temporary racks are 0.5 inches wider, 0.005 inches thicker core, and have a 2% greater areal density of boron than the DAEC racks. The weight of the temporary racks is 20% heavier when empty and 4% heavier when full of fuel.

No significant differences exist which would affect the thermal results previously submitted. An analysis has been conducted in the same manner as described in section 4.2 of the October 13, 1977, submittal to determine the maximum pool temperature that is predicted to occur with the actual fuel discharge exposures three weeks after shutdown. The maximum bulk pool temperature so calculated with two spent fuel pool cooling pumps and two heat exchangers in operation is 135°F.

The increased distance between fuel bundles and increased boron areal density both are conservative with respect to the previous criticality evaluation. The temporary racks were analyzed for 3.0% enrichment compared to 3.1% enrichment analyzed in the DAEC submittal. An evaluation of these combined effects (without taking into account the increased boron) by the consultant who performed the analyses for the DAEC racks, confirms the conservatism of the DAEC criticality results applied to the temporary racks. In addition, additional conservatism exists as no fuel at the DAEC has an initial enrichment greater than 2.74%.

The seismic considerations involved with the use of the temporary racks do not present non-conservative alterations to the results of the analyses performed for the DAEC racks.

The physical differences result in equal or greater section properties in the temporary racks due to thicker material sections. This allows the temporary racks to withstand greater seismic loads than the DAEC racks.

The difference in height yields a lower center of gravity for the temporary racks which decreases rack rocking displacement, rack-to-rack impact loads (between the 8 x 10 racks) and foot impact loads compared to those analyzed for the DAEC racks.

The rack geometry is such that no difference in the range of coefficients of friction used in the analysis of DAEC rack movement is required for the temporary racks. As the temporary 8 x 10 racks are heavier than the DAEC 8 x 10 and 8 x 8 racks and lighter than the other DAEC racks, the rack sliding displacement of 1.05 inches reported in the DAEC submittal is a bounding estimate of the movement of the temporary racks. The temporary racks will be placed a minimum of 6 inches from all equipment and pool walls and will have no effect on existing pool equipment.

Three originals and 37 copies of this submittal are transmitted herewith. This submittal is true and accurate to the best of my knowledge and belief.

IOWA ELECTRIC LIGHT AND POWER COMPANY

BY: K. A. Meyer for
Lee Liu
Senior Vice President, Engineering

LL/KAM/so

Attach.

cc: K. Meyer
D. Arnold
R. Lowenstein
R. Clark (NRC)
L. Root
File J-81d

Subscribed and Sworn to before me on
this 29th day of June 1978

Valerie J. Hall
Notary Public in and for the District
of Columbia

My Commission Expires December 14, 1982

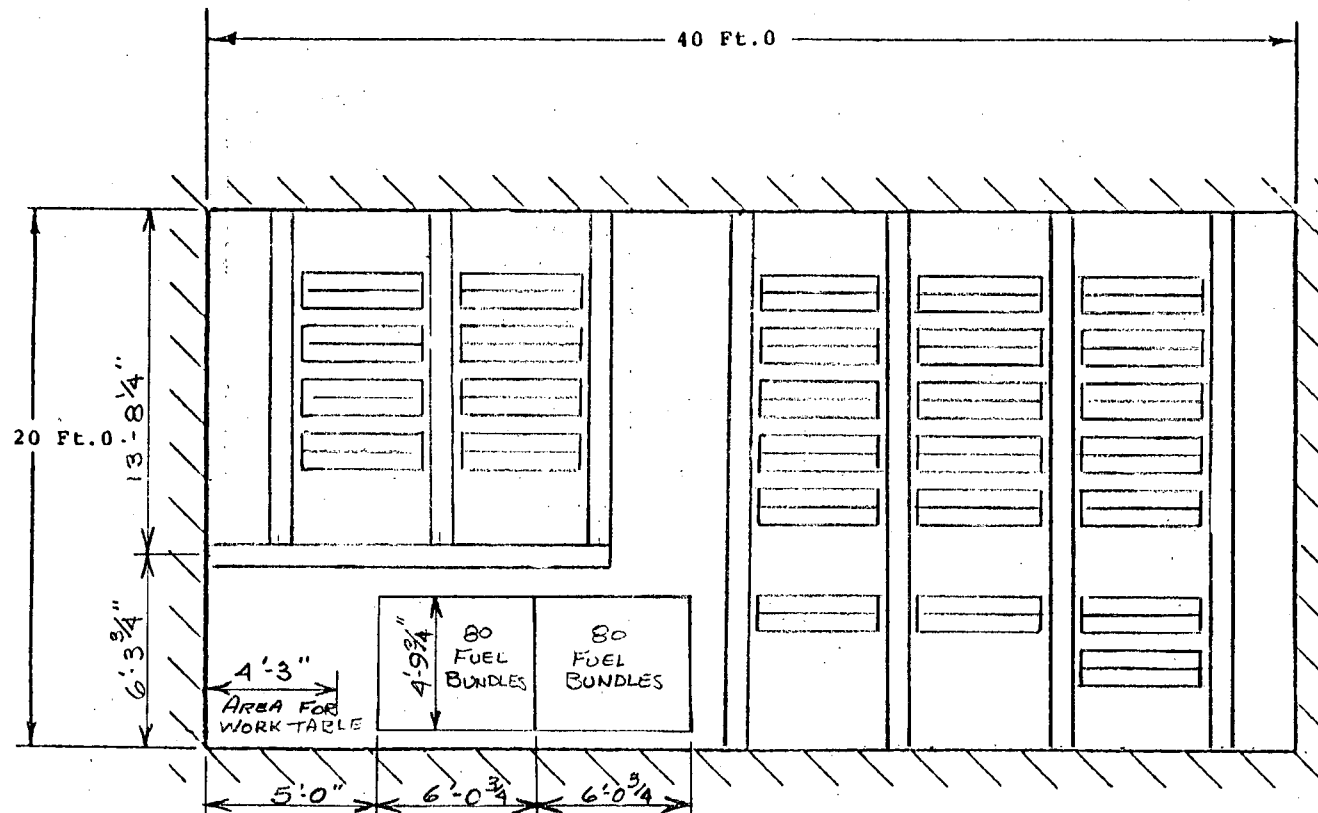


FIGURE 1