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AUTH.NAME AUTHOR AFFILIATION
ROOT,L.D. Iowa Electric Light & Power Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Suppls util 811215 rept on NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," in response to Franklin Research Ctr draft technical evaluation rept dtd 811023.

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Iowa Electric Light and Power Company
December 2, 1982
NG-82-2530

LARRY D. ROOT
ASSISTANT VICE PRESIDENT
NUCLEAR GENERATION

50-331

Mr. Harold Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Denton:

This letter and attachments are provided as a supplement and clarification to Iowa Electric's report on Control of Heavy Loads at the Duane Arnold Energy Center dated December 15, 1981.

References given in the attachments refer to paragraphs within the Franklin Research Center draft Technical Evaluation Report dated October 23, 1981.

Please contact this office if there are questions concerning this matter.

Very truly yours,

Larry D. Root

Larry D. Root
Assistant Vice President

LDR/BWR/rh*

cc: B. Reid
D. Arnold
L. Liu
S. Tuthill
F. Apicella (NRC)
NRC Resident Office

A033

The following information is provided in response to the Franklin Research Center's draft technical evaluation report dated October 23, 1981 and supplements and/or clarifies Iowa Electric's report on Control of Heavy Loads at the Duane Arnold Energy Center, dated December 15, 1981. References given are to paragraphs within the FRC report.

2.1.2 Safe Load Paths

In our letter, LDR-81-186, Mr. Root to Mr. Denton, dated June 5, 1981, Iowa Electric provided an explanation of our intended implementation of safe load path designation. Those heavy loads handled by the reactor building crane whose postulated drop produced unacceptable consequences have had procedural revisions outlining the safe load path and, where practical, sketches of the load path included.

A procedure is being developed for handling spent fuel shipping casks. Since no spent fuel shipments are anticipated in the near future and since specific data on the spent fuel shipping cask is unavailable, this procedure warns the user of the need to ascertain and document a safe load path prior to any movement of a spent fuel shipping cask.

2.1.3 Load Handling Procedures

In our response to question 2.1.3.(b), we state "procedures which cover the handling of heavy loads by cranes and hoists in the vicinity of the safe shutdown equipment will be written, if necessary...". Our intention is to provide general load handling procedures for those loads that are handled in the vicinity of safe shutdown equipment but are not carried over spent fuel in the storage pool or the reactor vessel. (The latter loads will be covered with specific procedures). These general procedures will include instructions on selection and use of equipment, verification of current inspection, and bases for load path selection.

A procedure for movement of a spent fuel shipping cask is being developed as discussed in response to item 2.1.2 above.

2.1.5 Special Lifting Devices

General Electric, supplier of the rotor lifting beam, reactor vessel head strongback, and dryer separator sling has been requested to address the specific sections of ANSI N14.6-1978 listed on the Franklin Research Center evaluation of ANSI N14.6-1978 (TER C5257-110/111) as sections 3.1, 3.2, 3.3, and 4.1. This information is expected to be available during the first quarter of 1983.

2.1.6 Lifting Devices

All rigging, i.e., lifting devices not specially designed, is being replaced. The new rigging will satisfy ANSI B30.9-1971 criteria and be accompanied with proof test certification. Slings will be permanently marked with their rated "static load" capacity. Dynamic loading is

accommodated in the procedures by requiring the sling capacity as marked to be derated in accordance with the impact allowance specified in paragraph 3.3.2.1.1.3 of CMAA Specification #70. This method results in a more conservative sling selection since the sling capacity is being derated rather than the static weight increased. Additionally, the specific dynamic loads capable of being imposed by individual hoists will be accounted for on a case by case basis. Slings that are restricted to use with only certain loads will be clearly marked to indicate the restriction.

2.1.8 Crane Design

A point for point comparison between ANSI-B30.2-1976, Chapter 2-1 and CMAA Specification #70, Revised 1975 has been completed. Attachment B lists those items found to be in non-compliance with the reference specifications; our evaluation of these items concluded that the safe operation of both the reactor building and turbine building cranes is not degraded.

2.2 Interim Protection Measures

Iowa Electric has committed to upgrade the reactor building crane to the single-failure proof guidelines of NUREG-0612, Appendix C. In the interim, the following protective measures are being instituted:

a) Associated lifting devices and load lift points for loads identified as required upgrade are being analyzed to verify compliance with NUREG-0612, paragraphs 5.1.6(1) and (3).

b) An inspection of the crane will be performed in accordance with ANSI B30.3.0-1976, paragraph 2-3.2.1.1, Special Heavy Lifts, subparagraphs a, b, and d. This inspection will be made prior to the next refueling outage.

In addition to these interim measures, a review of the existing reactor building crane revealed the following items which enhance the safety of operation: the crane is rated at 100 tons, the heaviest load lifted has a static weight of 75 tons; the trolley has an interlock (key lock switch) to prevent movement over both the spent fuel pool and the reactor cavity. The operating history of the crane provides a high confidence for safe performance.

ATTACHMENT B

Items of Non-Compliance with ANSI B30.2-1976, Chapter 2-1
and CMAA Specification No. 70, Revised 1975

Turbine Building Crane

CMAA #70

Paragraph	Comment
3.8.4	The one percent (1%) difference that the estimated wheel load exceeds the "Guide" wheel load shown in CMAA #70 will have no detrimental effect on the operation of the crane.
5.1.3	"The electrical equipment shall be furnished in accordance with the applicable requirements of Article 610 of the latest issue of the National Electric Code, and the installation and wiring shall be made in a workman-like manner." The subject crane was shipped from Harnischfeger in December of 1971. At the time that this crane was built, industry standards for cranes and hoists did not include motor branch short circuit protection. The 1971 National Electric Code was not specific in this area, whereas the current 1981 NEC, Section 610-42(A) specifically states, "Crane hoist and monorail hoist motor branch circuits shall be protected by fuses or inverse time circuit breakers having a rating in accordance with Table 430-152." A similar situation occurs with respect to clearance. The current NEC Section 610-57 states, "The dimension of the working space and the direction of access to life parts which are likely to acquire examination, servicing, or maintenance while alive shall be a minimum of 2 1/2 feet. Where controls are enclosed in cabinets, the door shall either open at least 90° or be removable." The 1971 NEC did not contain Section 610-57 nor were any similar statements made about control clearances within Article 610.
5.6.10	"Electrical safety features shall be in accordance with ANSI B30.2 Safety Code." Comments in regard to the ANSI spec. are made later.
5.8.1	"Unless otherwise specified, the arrangement of a pendant pushbutton station if in a vertical line should read from top to bottom: stop/start, up/down, (main hoist) (auxiliary hoist), right/left, (trolley), forward/reverse, (bridge)." The pendant pushbutton station is not in a vertical line, rather two sections side by side.
5.8.3	"Stop pushbuttons shall be red." The stop pushbutton is black.

ANSI B30.2

Statement	Comment
2-1.10.1(a)	"Wiring and equipment shall comply with Article 610 of the NEC, ANSI C-1 (NFPA 70)." The same comments are applicable to those made in the CMAA #70 review, Paragraph 5.1.3.
2-1.10.3(k)	"The arrangement of pendant pushbutton stations and radio control cranes should conform to Figure 4 of the standard." Subject crane has a dual vertical row due to the number of elements, and therefore does not specifically follow this arrangement.
2-1.10.5(b)	"On cab operated cranes, a switch or circuit breaker of the enclosed type with provision for padlocking in the open position shall be provided in the leads from the runway conductors. A means of opening this device shall be located within the reach of the operator when operator is in the operating position. When operator opens this switch or circuit breaker, the holding brake should set." On subject crane, this switch is mounted on the bridge platform and not in the operator's cab. However, it does contain a magnetic contactor which is controlled by a momentary pushbutton within the operator's cab. Depression of the stop pushbutton within the cab will deenergize the magnetic contactor and set all holding brakes on the crane.

Reactor Building Crane
CMAA #70

Paragraph	Comment
5.1.3	"The electrical equipment shall be furnished in accordance with the applicable requirements of Article 610 of the latest issue of the National Electric Code, and the installation and wiring shall be made in a workman-like manner." The subject crane was shipped from Harnischfeger in December of 1971. At the time that this crane was built, industry standards for cranes and hoists did not include motor branch short circuit protection. The 1971 National Electric Code was not specific in this area, whereas the current 1981 NEC, Section 610-42 (A) specifically states, "Crane hoist and monorail hoist motor branch circuits shall be protected by fuses or inverse time circuit breakers having a rating in accordance with Table 430-152." A similar situation occurs with respect to clearance. The current NEC Section 610-57 states, "The dimension of the working space and the direction of access to life parts which are likely to acquire examination, adjustment, servicing, or maintenance while alive shall be a minimum of 2 1/2 feet. Where controls are enclosed in

Paragraph	Comment
	cabinets, the door shall either open at least 90° or be removable. The 1971 NEC did not contain Section 610-57 nor were any similar statements made about control clearances within Article 610.
5.6.10	"Electrical safety features shall be in accordance with ANSI B30.2 Safety Code." Comments in regard to the ANSI spec. are made later.
5.8.1	"Unless otherwise specified, the arrangement of a pendant pushbutton stations if in a vertical line should read from top to bottom: stop/start, up/down, (main hoist) (auxiliary hoist), right/left, (trolley), forward/reverse, (bridge)." The pendant pushbutton station is not in a vertical line, rather two sections side by side.
5.8.3	"Stop pushbuttons shall be red." The stop pushbutton is black.
5.8.5	"Pendant pushbutton stations shall have a grounding conductor between a ground terminal in the station and the crane." A grounding conductor was provided within the pendant pushbutton cable, however the ground connection was not shown on the crane interconnection drawing.

B30.2

Statement	Comment
2-1.10.1(a)	"Wiring and equipment shall comply with Article 610 of the NEC, ANSI C-1 (NFPA 70)." The same comments are applicable to those made in the CMAA 70 review, Statement 5.1.3.
2-1.10.3(k)	"The arrangement of pendant pushbutton stations and radio control cranes should conform to Figure 4 of the standard." Figure 4 shows the pushbutton station in a vertical arrangement. Subject crane has a duel vertical row due to the number of elements, and therefore does not specifically follow this arrangement.
2-1.10.5(b)	"On cab operated cranes, a switch or circuit breaker of the enclosed type with provision for padlocking in the open position shall be provided in the leads from the runway conductors. A means of opening this device shall be located within the reach of the operator when operator is in the operating position. When operator opens this switch or circuit breaker, the holding brake should set." On subject crane, this switch is mounted on the bridge platform and not in the operator's cab. However, it does contain a magnetic contractor which is controlled by a momentary pushbutton within the operator's cab. Depression of the stop pushbutton within the cab will deenergize the magnetic contactor and set all holding brakes on the crane.