Public Service Company of Colorado

P. O. Box 840, Denver, Colorado 80201

December 29, 1982
Fort St. Vrain
Unit No. 1
P-82561

Mr. Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing
Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: NUREG-0612, Control of Heavy Loads

REFERENCE: G-82374

Gentlemen:

The following is Public Service Company of Colorado's response to your letter of November 19, 1982 for additional information regarding the control of heavy loads (NUREG-0612).

Guideline 1 - Noncompliance

"(2) PSC should provide a written analysis of safe load paths relative to the use of the fuel handling machine near the PCRV. Also address the marking of safe load paths and methods of securing approval for departure therefrom."

PSC RESPONSE

During plant operation, the area above the prestressed concrete reactor vessel (PCRV) is restricted from travel by the reactor building crane with a load. This is the only restriction on the travel of the reactor building crane. This restriction is in the form of administratively controlled procedures. Since this critical area is restricted, PSC feels that there is no need for the marking of safe load paths.

The design of the refueling floor is such that there is no safety related equipment in the vicinity of the Reactor Building Crane. The design of the lifting devices, which connect the fuel handling machine to the Reactor Building Crane, is such that there is a large factor of safety (greater than 6) built into the design. Additionally, the lifting cable has a backup snubber system which, in the unlikely event of a cable break, would become engaged, thus preventing a heavy load drop.

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Original

At no time is the heavy load carried more than 14 inches off of the floor, thereby holding the potential drop distance to a minimum. Because of these reasons, PSC is of the opinion that Guideline 1 has been satisfied and no further action is required.

Departure from the restricted areas of reactor building crane travel would require, per the Tech Specs., that the change be approved by two members of the plant management staff, at least one of whom holds a senior reactor operators license.

Guideline 2 - Compliance

PSC should address the level of management necessary to approve procedural changes.

PSC RESPONSE:

The level of management required to approve procedural changes would be of the supervisory level or above.

Guideline 3 - Compliance

No PSC Response Required

Guideline 4 - Noncompliance

"(2) PSC should submit a statement addressing compliance w th ANSI N14.6-1978, as modified by Guideline 4.

PSC RESPONSE:

Guideline 4 requires "special lifting devices" to be in compliance with a Modified Version of ANSI N14.6-1978, "Standard for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 Kg) or More for Nuclear Materials."

ANSI N14.6-1978 as modified by NUREG-0612 deals with design, maintenance and inspection of special lifting devices used for handling heavy loads at nuclear facilities. Fort St. Vrain Nuclear Generating Station (FSVNGS) uses such devices only for lifting and positioning of the fuel handling machine. As specified in ANSI N14.6, these devices are, specifically, a pair of shackles which loop over the crane lifting hook and are pin connected to a specially designed lifting "mushroom". The design of the mushroom is such that it affords positive mating to the upper head of the fuel handling machine. A light and switch assembly indicates positive connection of the special lifting devices to the fuel handling machine.

The shackles and the mushroom were analized and have factors of safety that exceed the requirements of ANSI N14.6-1978.

For these reasons, PSC is of the opinion that the special lifting devices for heavy loads in use at FSVNGS satisfies the intent of Guideline 4.

Guideline 5 - Noncompliance

This guideline requires compliance of lifting devices not specially designed per ANSI B30.9-1971.

PSC RESPONSE

According to Section 9-0.1 of ANSI B30.9, this specification applies to slings.

The operation of the Reactor Building Crane for lifts of heavy loads is limited to the fuel handling machine. Since this operation does not involve the use of slings, PSC is of the opinion that Guideline 5 is not specifically applicable to heavy load operations at Fort St. Vrain Nuclear Generating Station.

Guideline 6 - Compliance

No PSC Response Required

Guideline 7 - Noncompliance

PSC should provide an analysis of compliance with Chapter 2-1 of ANSI B30.2-1976

PSC RESPONSE

See Attachment 1

Very truly yours,

Lawrence Brey

H. L. Brey, Manager
Nuclear Engineering Division

HLB/RAG:PA

Attachment

cc: John T. Collins

ATTACHMENT 1

Analysis of Compliance of the FSV Reactor Building Crane with Chapter 2-1 of ANSI B30.2-1976

The following is a point by point analysis of compliance of the Reactor Building overhead crane with ANSI B30.2-1976 Chapter 2-1.

The following documents will be referenced as noted throughout the text.

1. "Reactor Building Overhead Traveling Bridge Crane Specification", prepared by Gulf General Atomic, San Diego, California.

   Spec. No. 72-G-1 Issue E 7-24-68

   Referred to as Ref 1

2. "Standard Specification for Electric Overhead Traveling Bridge Cranes", Form 280-B, Sargent and Lundy Engineers, Chicago 10-16-62.

   Referred to as Ref 2

3. "Standard Specifications for Alternating Current Motors and Electrical Equipment for Motor Operated Cranes", Form 1820-E, Sargent and Lundy Engineers, Chicago 6-3-63.

   Referred to as Ref 3

4. Crane Manufacturers Association of American Specification #70 (CMAA-70) "Specifications for Electric Overhead Traveling Cranes".

   Referred to as Ref 4

Ref 1 is the original specification to which the equipment under consideration was constructed.

Sections 7.A and 7.B of Ref 1 specifically make Ref 2 and 3 a part of the Ref 1 specification.

A letter dated December 14, 1981, to Mr. Eisenhut of the NRC from Mr. O. R. Lee (Attachment 1) indicates compliance with CMAA-70 in 1972. It is, therefore, considered that all points in CMAA-70 (Ref 4) are satisfied and, therefore, corresponding sections of ANSI B30.2 are likewise satisfied.

A letter dated October 23, 1972, to Mr. Walker of PSC from Mr. Habush of Gulf General Atomic states that the building structure is adequate for a 170 ton rating. Additionally, in an October 10, 1972 letter as above, GGA states that the crane structure itself is satisfactory for the 170 ton rating and that appropriate nameplates have been attached to the crane and load block.

ANALYSIS OF COMPLIANCE ANSI B30.2
BY POINTS AS LISTED IN B30.2

SECTION 2-1.1	MARKING
2-1.1.1	Appropriate plates attached per inspection and aforementioned letter.
SECTION 2-1.2	CLEARANCES
2-1.2.1a	Acceptable per Ref 4 Section 1.2 and Whiting Corporation drawings of the FSV reactor building crane.
2-1.2.1b	Acceptable per Ref 2 Section 4.C and drawings.
2-1.2.2	Not applicable.
SECTION 2-1.3	GENERAL CONSTRUCTION - RUNWAYS AND SUPPORTING STRUCTURE
2-1.3.1a	Acceptable per standard building practice.
2-1.3.1b,c,d	Not Applicable to indoor crane systems.
2-1.3.1e,f	Not applicable.
2-1.3.2a pts 1-6	Acceptable per Ref 4, GGA analysis of the reactor building crane support structure and per various points of Ref 1 to 3.
2-1.3.2b	1) Provided per Section 7 of Ref 2. 2) Refer to indicated section. 3) Not applicable.
SECTION 2-1.4	CRANE CONSTRUCTION
2-1.4.1	Intent of section satisfied by Section 3.0.6 of Ref 2, Gulf General Atomic Certification of 170 ton rating and Section 3.2 of Ref 4.
2-1.4.2:	Girders are acceptable per Ref 4 and standard engineering practice.
2-1.4.3	Modifications for re-rating are acceptable per Gulf General Atomic analysis. Rating signs are attached.
SECTION 2-1.5	CABS
	The equipment in question is not operated from a cab so that Sections 2-1.5.1, .2, .3 are not applicable.
2-1.5.4	No tool box is provided on the crane structure.

2-1.5.5	Approved fire extinguishers are available in accessible locations in the operating area.
2-1.5.6	The crane is pendant operated from the floor. The area is well-lit per reactor building/crane drawings and Section 13.D of Ref 1.
SECTION 2-1.6	LUBRICATION
2-1.6.1	Acceptable per Section 15.A Ref 2.
SECTION 2-1.7	FOOTWALKS AND LADDERS
2-1.7.1a	Not applicable (non-cab operated).
2-1.7.1b	Suitable footwalks are provided per Whiting Corporation crane drawings and Section 4 of Ref 2.
2-1.7.2a	Acceptable per Section 3.5 of Ref 4.
2-1.7.2b	Acceptable per Section 3.5 of Ref 4.
2-1.7.2c	Acceptable per Section 4.C of Ref 2.
2-1.7.2d	Not applicable.
2-1.7.3	Intent satisfied per Section 3.5 of Ref 4 and by Section 4 of Ref 2.
2-1.7.4a	Not applicable.
2-1.7.4b,c	Intent satisfied per drawings and various provisions of Ref 2 and 4.
2-1.7.5	Not applicable.
SECTION 2-1.8	STOPS, BUMPERS, RAIL SWEEPS AND GUARDS
2-1.8.1a	Trolley stops are provided per crane drawing and per Section 8 of Ref 2.
2-1.8.1b	Refer to referenced section (2-1.8.2).
2-1.8.1c	Not applicable.
2-1.8.2a pts 1-3	Acceptable per articles of Section 4.12.1 of Ref 4.
2-1.8.2b	Acceptable per Section 4.12.1.2 of Ref 4.
2-1.8.2c	Not applicable.
2-1.8.3	Intent of applicable sections is satisfied by Section 4.12.3 of Ref 4.
2-1.8.4a	Not applicable.

2-1.8.4b	Acceptable per Section 6.C of Ref 2.
2-1.8.4c	Acceptable per Section 16.B of Ref 2.
2-1.8.5	Intent is satisfied by 9.D of Ref 2 and by inspection of drawings.
2-1.8.6	Intent is satisfied per Section 1.E of Ref 1 and Section 6.E of Ref 2.
2-1.8.7	The intent of points a-c is satisfied by Section 16 of Ref 2.

SECTION 2-1.9 BRAKES

2-1.9.1a	Acceptable per Section 13.Ba of Ref 2.
2-1.9.1b	Acceptable per Section 13.B.b of Ref 2.
2-1.9.2a	Points 1, 2, and 3 are satisfied by Section 13.B.a of Ref 2 and by Section 4.7.4.2 of Ref 4.
2-1.9.2b	Intent is satisfied by quality materials and workmanship provisions of Ref 2, 2 and 4, and by reference to NEMA specifications.
2-1.9.2c	Satisfied by Section 4.7.4.1 of Ref 4 and by Section 13.B.a of Ref 2.
2-1.9.2d	Satisfied per Section 7 of Ref 3.
2-1.9.2e	See justification of 2-1.9.2b.
2-1.9.2f	Not applicable.
2-1.9.3a	Satisfied per Section 13.B.b of Ref 2 and Section 4.7.5.2 of Ref 4.
2-1.9.3b	See justification of 2-1.9.2b.
2-1.9.4a,b	Not applicable.
2-1.9.4c	Electric brakes per Section 13.A.b of Ref 2 are provided.
2-1.9.4d	Satisfied by point F of Ref 3.
2-1.9.4e	See justification of 2-1.9.2b.
2-1.9.4f,g,h	Not applicable
2-1.9.4i	Intent satisfied per Section 4.7.2.3 and 4.7.3.3 of Ref 4 and by Section 13.A.b of Ref 2.
2-1.9.4j	See Section 22 of Ref 1.
2-1.9.4k	See justification of 2.1.9.2b.

2-1.9.5a	Intent satisfied per Section 13.A.b of Ref 2.
2-1.9.5b	Satisfied by braking system.
2-1.9.5c	As per 2-1.9.4j.
2-1.9.5d	See justification of 2-1.9.2b.
2-1.9.5e	Intent satisfied per Section F of Ref 3.
2-1.9.6a	Not applicable.
2-1.9.6b	Intent is satisfied per Section 13.A.b of Ref 2.
2-1.9.6c	Not applicable.
2-1.9.6d	Intent is satisfied by braking system.
2-1.9.7a,b	Not applicable.
2-1.9.7c	Intent is satisfied by braking system.
SECTION 2-1.10	ELECTRICAL EQUIPMENT
2-1.10.1a	Satisfied by Section 5.1.3 of Ref 4.
2-1.10.1b	Satisfied by Section 5.H of Ref 3.
2-1.10.1c	Satisfied by Section 5.8.8 of Ref 4.
2-1.10.1d	Satisfied per Section 5.8.6 of Ref 4.
2-1.10.1e	Intent is satisfied by Section 5.8.5 of Ref 4, Section 5.I of Ref 3, and Section D of Ref 1.
2-1.10.2a,b,c	Intent satisfied by Section 16.A of Ref 2 and Section 5.A of Ref 3.
2-1.10.3a	Satisfied by Section 5.8.7 of Ref 4.
2-1.10.3b	Not applicable.
2-1.10.3c	Man al controller is hand held
2-1.10.3d,e,f	Not applicable.
2-1.10.3g,h	Satisfied per Section 5.8.7 of Ref 4.
2-1.10.3i	Not applicable.
2-1.10.3j	Not applicable.
2-1.10.3k	Satisfied per Section 5.8.1 of Ref 4.
2-1.10.4a	Satisfied per Section 5.5.4 of Ref 4.
2-1.10.4b	See justification of 2-1.9.2b.

2-1.10.4c	See justification of 2-1.10.4.9.
2-1.10.5a	Circuit breaker exists on Level 5 and master switch on pendant satisfy intent of this provision.
2-1.10.5b	Not applicable.
2-1.10.5c	The intent of this provision is met by an independent circuit breaker and a switch.
2-1.10.5d,e	Satisfied per Section 13 of Ref. 1.
2-1.10.5f	Not applicable.
2-1.10.6	Satisfied per inspection of crane drawings and discussion with maintenance personnel.
2-1.10.7	Not applicable.

SECTION 2-1.11 HOISTING EQUIPMENT

2-1.11.1a	Intent is satisfied by Section 11.A of Ref 2.
2-1.11.1b,c	Not applicable except during rope or mechanism change.
2-1.11.1d	Acceptable per inspection of drawings.
2-1.11.1e	Not applicable.
2-1.11.1f	Acceptable per point 15 of Ref 2.
2-1.11.1g	PSC inspection schedules are in accordance with ANSI B30.2.
2-1.11.2a	Acceptable per Section 4.2.1 of Ref 4.
2-1.11.2b	Rope anchorages provided by manufacturer.
2-1.11.2c	Point 1: Acceptable per Section 4.4.2 of Ref 4.
	Point 2: Anchorage provided and maintained per manufacturer specifications.
2-1.11.2d	Splicing of ropes is not allowed.
2-1.11.2e	Not applicable.
2-1.11.2f	Tapered wedge lock type anchorages were provided by manufacturer.
2-1.11.2g	Not applicable.
2-1.11.2h	Replacement rope meets or exceeds rope specifications per Section 2-1.11.2a ANSI B30.2.

2-1.11.3 Heavy load to be lifted is symmetrical with respect to lifting ropes, equalizing sheaves are also provided in the reeving system.

2-1.11.4 Retaining latches are provided per drawing on hook. See Section 11.C of Ref 2 for specific compliance.

2-1.12 Acceptable per point 15 of Ref 1.

CONCLUSIONS

The applicable provisions of Chapter 2-1 of ANSI B30.2-1976 are met for the Ft. St. Vrain Reactor Building crane.