OCONEE NUCLEAR STATION

STANDBY SHUTDOWN FACILITY

CONTROL OF HEAVY LOADS

(NUREG 0612)

July 20, 1981

Introduction

The information presented in this report is the result of a detailed evaluation of the load handling systems as requested by the NRC in their letter dated December 22, 1980 concerning NuReg 0612 "The Control of Heavy Loads at Nuclear Power Plants."

Scope

This report addresses the requirements set forth in Section 2.1 of Enclosure 3 of the NRC's letter as they pertain to the Standby Shutdown Facility at Oconee Nuclear Station. This Facility is presently under construction.

Initial Review

Crane/Load List

A list containing all load handling systems and their respective loads was compiled and compared to the Standby Shutdown Facility General Arrangement drawings to verify "as built" conditions.

Development of Load Drop Areas

Load drop areas were developed for each load handling system and shown on the General Arrangement drawings. For the crane, the load drop area was defined as the area over which the hook may pass if trolley and bridge travel is unrestricted. The load drop area for monorails is the vertical projection of the monorail on the floor plus an allowance for load shape. In all cases the load drop area was projected to the basement.

Load Handling Systems to Receive Further Consideration

The list of load handling systems with their respective loads was reviewed to determine which systems handled heavy loads (1500 lbs. or more). Systems handling heavy loads received further evaluation. Systems not handling heavy loads were dropped from consideration.

Locating "Vital Systems" in Load Drop Areas

"Vital Systems," defined as those systems necessary for safe shutdown or decay heat removal, located in the load drop areas of heavy load handling systems, were identified and superimposed on the General Arrangement drawings.

Table 1

Table 1 summarizes the results of the initial review of load handling systems in the Standby Shutdown Facility. This table identifies heavy load handling systems having vital equipment in their load drop areas which will require further analysis. These systems are listed in column 5 of Table 1.

Additional Information

Scope

The load handling systems identified in Table I as handling heavy loads over vital equipment were reviewed for compliance with Section 2.1-3 of Enclosure 3 of the December 22, 1980 letter. The results of that review are described in the following sections and summarized in Table II.

Establishment of Safe Load Paths

Safe load paths were established for all load handling systems identified in column 5 of Table I. The safe load path of the crane avoids vital systems. The safe load paths for monorails are the vertical projections of the beams on the floor.

Locate Safe Load Paths on General Arrangement Drawings

The crane's safe load path is shown on the General Arrangement drawings. The safe load paths of the monorails are not shown on the drawings since the load paths are constrained by the beams themselves.

Locate Safe Load Paths on the Station Floor

The safe load path of the crane located in the Standby Shutdown Facility will be painted on the floor before the Facility becomes operational. Monorails do not require their safe load paths to be painted since the loads can not deviate from the monorail alignment.

Safe Load Paths Described in Directives

Directives have been written explaining the purpose of safe load paths including Enclosures describing the actual paths for heavy load handling systems at the Station. The heavy load handling systems in the Standby Shutdown Facility will be incorporated into these Directives before the Facility becomes operational.

Measures Taken to Ensure Load Handling Operations Remain Within Safe Load Paths

Monorails require no measures to ensure loads travel along their safe load paths. Measures taken to insure that heavy loads handled by the crane remain within safe load paths will be implemented before the Facility becomes operational and will include; placing the safe load paths on the General Arrangement drawings, painting the paths on the floor at the Station, and the incorporation of this crane into existing Station Directives with an enclosure. The enclosure will be attached to the crane and will include a description of its safe load paths, instructions for special lifts, the appropriate procedures where required and any restrictions placed on the crane or hoist.

Establishment of Load Handling Procedures

The Directives described above fully comply with the requirements set forth in Seciton 5.1.1.(2) of NuReg 0612 for load handling procedures.

Table II

Table II was prepared for each load handling system in column 5 of Table I and summarizes the information requested in Sections 2.1-3c through 2.1-3g. The table is self-explanatory.

Conclusion

Our initial review of the load handling systems in the Standby Shutdown Facility revealed a total of one crane and two monorails which will handle heavy loads over vital equipment. Further investigation of these systems showed that each one will comply fully with the requriements set forth in Section 2.1-3 of Enclosure 3 before the Facility is placed in service.

All information requested under Section 2.1 of Enclosure 3 for the Standby Shutdown Facility is included in this submittal.

TABLE I

STANDBY SHUTDOWN FACILITY

CRANE OR HOIST	G. A. NUMBER SEE DWG 0-315H	DOES NOT HANDLE HEAVY LOADS	VITAL EQUIPMENT NOT LOCATED IN THE LOAD DROP AREA	HANDLES HEAVY LOADS AND HAS VITAL EQUIPMENT LOCATED IN THE LOAD DROP AREA
Water Sep. Pump Monorail	SS01	X		
HVAC S. W. Pump Monorail	SS02	X		
HVAC S. W. Pump Monorail	SS03	X		
Battery Room Crane	SS04	X		
Battery Room Crane	SS05	X		
Generator Room Crane	SS06			X
Equipment Hatch Monorail	SS07			X
Second Floor Equipment Hatch Monorail	SS08			X

TABLE II

Crane or Hoist: Generator Room Crane

General Arrangement No: SS06

Capacity: 2 Tons

Compliances

Crane Inspection

ANSI B30.2 - 1976, Ch. 2-2: Yes

Crane Design

CMAA Spec. 70: (1)

ANSI B30.2 - 1976, Ch. 2-1: (1)

Operator Training

ANSI B30.2 - 1976: Yes

Load	Load Weight	Safe Load Paths			Is Movement Governed by a Load Handling Procedure?	Procedures For Deviation From SLP?	Lifting Device Used	Compliance To ANSI & NUREG 0612 Specs.
		Located on G.A. Dwgs.	Painted on Floor at Plant	Described in Procedures				
Heat Exchanger	1992 lbs	Yes	Yes	Yes	Yes		(2)	Yes
Misc. Pumps Motors	4000 lbs	Yes	Yes	Yes	Yes		(2)	Yes

TABLE II

Crane or Hoist: Equipment Hatch Monorail

General Arrangement No: SS07

Capacity: 10 Tons

Compliances

Crane Inspection

ANSI B30.2 - 1976, Ch.2-2: Yes

Crane Design

CMAA Spec. 70: (3)

ANSI B30.2 - 1976, Ch. 2-1: (3)

Operator Training

ANSI B30.2 - 1976: Yes

Load	Load Weight	Safe Load Paths			Is Movement Governed by a Load Handling Procedure?	Procedures For Deviation From SLP?	Lifting Device Used	Compliance To ANSI & NUREG 0612 Spec.
		Located on G.A. Dwgs.	Painted on Floor at Plant	Described in Procedures				
Strainer	2150 lbs	(4)	(4)	(4)	Yes	(4)	(2)	Yes
ASW Pump	7000 lbs	(4)	(4)	(4)	Yes	(4)	(2)	Yes
ASW Motor	8400 lbs	(4)	(4)	(4)	Yes	(4)	(2)	Yes
Hatch Cover	7200 lbs	(4)	(4)	(4)	Yes	(4)	(2)	Yes

TABLE II

Crane or Hoist: Second Floor Equiptment Hatch Monorail

General Arrangement No: SS08

Capacity: 3 Tons

Compliance

Crane Inspection

ANSI B30.2 - 1976, Ch. 2-2: Yes

Crane Design

CMAA Spec. 70: (3)

ANSI B30.2 - 1976, Ch. 2-1: (3)

Operator Training

ANSI B30.2 - 1976: Yes

Load	Load Weight	Safe Load Path			Is Movement Governed by a Load Handling Procedure?	Procedures For Deviation From SLP?	Lifting Device Used	Compliance To ANSI & NUREG 0612 Specs.
		Located on G.A. Dwgs.	Painted on Floor at Plant	Described in Procedures				
HVAC Condenser Unit	4300 lbs	(4)	(4)	(4)	Yes	(4)	(2)	Yes
Misc. Equipment	6000 lbs	(4)	(4)	(4)	Yes	(4)	(2)	Yes
Hatch Cover	5400 lbs	(4)	(4)	(4)	Yes	(4)	(2)	Yes

(1) These specifications do not apply to this crane. This crane was designed in accordance with applicable sections of the AISC Steel Construction Manual, 7th Edition, and the AISC Specification for the Design, Fabrication, and Erection of Structural Steel Buildings.

(2) The lifting devices used in handling these loads consist of the appropriate size and number of chain-falls, chokers and slings as determined by the rigger.

In making his selection, the rigger draws on his experience and his Elementary and Advanced Rigger Training provided at the Duke Power Company Training Center. Choker and Sling sizing is determined by the estimated weight of the load. If additional information is needed, the Riggers Handbook is used. All lifts are made by qualified people who, by experience and/or training, are cognizant in the movement of loads.

(3) These specifications do not apply to the design of monorails. Our monorails were designed in accordance with the applicable AISC code.

(4) The Safe Load Path of a monorail can only be the vertical projection of the monorail on the underlying floor. For this reason it is unnecessary to perform this work.