

CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS
SEABROOK UNITS 1 AND 2

Docket Nos. 50-443, 50-444

Author
S. A. Jensen

Principal Technical Investigator
T. H. Stickley

EG&G Idaho, Inc.

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ABSTRACT

The Nuclear Regulatory Commission (NRC) has requested that all nuclear plants either operating or under construction submit a response of compliancy with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." EG&G Idaho, Inc. has contracted with the NRC to evaluate the responses of those plants presently under construction. This report contains EG&G's evaluation and recommendations for Seabrook.

EXECUTIVE SUMMARY

Seabrook does not totally comply with the guidelines of NUREG-0612. In general, compliance is insufficient in the following areas:

- o Satisfactory action on Guidelines 2, 3, 5, and 6 has been promised but not completed.
- o The Applicant has not satisfactorily responded to Guidelines 1, 4, and 7.

The main report contains recommendations which will aid in bringing the above items into compliance with the appropriate guidelines.

CONTENTS

ABSTRACT	i
EXECUTIVE SUMMARY	i
1. INTRODUCTION	1
1.1 Purpose of Review	1
1.2 Generic Background	1
1.3 Plant-Specific Background	3
2. EVALUATION AND RECOMMENDATIONS	4
2.1 Overview	4
2.2 Heavy Load Overhead Handling Systems	4
2.3 General Guidelines	8
3. CONCLUDING SUMMARY	17
3.1 Applicable Load Handling Systems	17
3.2 Guideline Recommendations	17
4. REFERENCES	19

TABLES

2.1 Crane/Hoist Systems Considered as Potential Sources for Damage of Safety Components	7
3.1 NUREG Compliance Matrix	20

TECHNICAL EVALUATION REPORT
FOR
SEABROOK STATION

1. INTRODUCTION

1.1 Purpose of Review

This technical evaluation report documents the EG&G Idaho, Inc. review of general load handling policy and procedures at Seabrook. This evaluation was performed with the objective of assessing conformance to the general load handling guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants" [1], Section 5.1.1.

1.2 Generic Background

Generic Technical Activity-Task A-36 was established by the U.S. Nuclear Regulatory Commission (NRC) staff to systematically examine staff licensing criteria and the adequacy of measures in effect at operating nuclear power plants to assure the safe handling of heavy loads and to recommend necessary changes to these measures. This activity was initiated by a letter issued by the NRC staff on May 17, 1978 [2], to all power reactor applicants, requesting information concerning the control of heavy loads near spent fuel.

The results of Task A-36 were reported in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." The staff's conclusion from this evaluation was that existing measures to control the handling of heavy loads at operating plants, although providing protection from certain potential problems, do not adequately cover the major causes of load handling accidents and should be upgraded.

In order to upgrade measures for the control of heavy loads, the staff developed a series of guidelines designed to achieve a two-phase,

objective using an accepted approach or protection philosophy. The first portion of the objective, achieved through a set of general guidelines identified in NUREG-0612, Article 5.1.1, is to ensure that all load handling systems at nuclear power plants are designed and operated such that their probability of failure is uniformly small and appropriate for the critical tasks in which they are employed. The second portion of the staff's objective, achieved through guidelines identified in NUREG-0612, Articles 5.1.2 through 5.1.5, is to ensure that, for load handling systems in areas where their failure might result in significant consequences, either (1) features are provided, in addition to those required for all load handling systems, to ensure that the potential for a load drop is extremely small (e.g., a single-failure-proof crane) or (2) conservative evaluations of load handling accidents indicate that the potential consequences of any load drop are acceptably small. Acceptability of accident consequences is quantified in NUREG-0612 into four accident analysis evaluation criteria.

The approach used to develop the staff guidelines for minimizing the potential for a load drop was based on defense in depth and is summarized as follows:

- o Provide sufficient operator training, handling system design, load handling instructions, and equipment inspection to assure reliable operation of the handling system
- o Define safe load travel paths through procedures and operator training so that, to the extent practical, heavy loads are not carried over or near irradiated fuel or safe shutdown equipment
- o Provide mechanical stops or electrical interlocks to prevent movement of heavy loads over irradiated fuel or in proximity to equipment associated with redundant shutdown paths.

Staff guidelines resulting from the foregoing are tabulated in Section 5 of NUREG-0612.

1.3 Plant-Specific Background

On December 22, 1980, the NRC issued a letter [3] to the Public Service Company of New Hampshire, the applicant for Seabrook requesting that the applicant review provisions for handling and control of heavy loads at Seabrook, evaluate these provisions with respect to the guidelines of NUREG-0612, and provide certain additional information to be used for an independent determination of conformance to these guidelines. In September 1982 the Public Service Company of New Hampshire provided the initial response [4] to this request.

2. EVALUATION AND RECOMMENDATIONS

2.1 Overview

The following sections summarize the Public Service Company of New Hampshire's review of heavy load handling at Seabrook accompanied by EG&G's evaluation, conclusions, and recommendations to the applicant for bringing the facilities more completely into compliance with the intent of NUREG-0612. The Public Service Company of New Hampshire's review of the facilities does not differentiate between the units so it is assumed that all units are of identical design. The applicant has indicated the weight of a heavy load for this facility (as defined in NUREG-0612, Article 1.2) as 2000 lbs.

2.2 Heavy Load Overhead Handling Systems

This section reviews the applicant's list of overhead handling systems which are subject to the criteria of NUREG-0612 and a review of the justification for excluding overhead handling systems from the above mentioned list.

2.2.1 Scope

"Report the results of your review of plant arrangements to identify all overhead handling systems from which a load drop may result in damage to any system required for plant shutdown or decay heat removal (taking no credit for any interlocks, technical specifications, operating procedures, or detailed structural analysis) and justify the exclusion of any overhead handling system from your list by verifying that there is sufficient physical separation from any load-impact point and any safety-related component to permit a determination by inspection that no heavy load drop can result in damage to any system or component required for plant shutdown or decay heat removal."

A. Summary of Applicant Statements

The applicant's review of overhead handling systems identified the cranes and hoists shown in Table 2.1 as those which handle heavy loads in the vicinity of irradiated fuel or safe shutdown equipment. However, the applicant excluded five (5) of the listed handling systems from evaluation in response to Section 2.1, Enclosure 3 of the NRC request for information. The applicant excluded these five (5) cranes or hoists on the basis of operating procedures and redundancy of the equipment over which they are located.

The applicant has also identified other cranes that have been excluded from satisfying the criteria of the general guidelines of NUREG-0612.

B. EG&G Evaluation

The applicant appears to have included most applicable handling systems in their tables showing handling for which a load drop could damage equipment. However, some monorails and cranes were not considered in the remainder of their response to Section 2.1 of Enclosure 3 of the NRC request [3] for information. The handling systems in question include: Radial Arm Stud Tensioner Hoists, Charging Pump Service Monorail Hoist, Radioactive Pipe Tunnel Service Monorail Hoist, Main Steam and Feedwater Pipe Chase Crane, and the Diesel Generator Service Crane.

These handling systems should have been considered in the remainder of the response to this section of the request for information since their exclusion takes into account credit for operating procedures and techniques or assumes

redundancy as the basis for not providing further safety evaluation. The basis for exclusion has some merit but is not a consideration for this section of the response.

The applicant has excluded two (2) handling systems which need a more detailed explanation for exclusion. The two systems are the spent Fuel Handling Crane, which was excluded on the basis that no safety equipment is in the area, and the Spent Fuel Pool Bridge and Hoist, which was excluded on the basis that it doesn't carry heavy loads. The Spent Fuel Handling Cask may not be near any safety equipment but it does appear to handle irradiated fuel which has safety implications. The Spent Fuel Pool Bridge and Hoist has a capacity of two (2) tons and should be included if procedural controls are all that eliminates it from consideration.

C. EG&G Conclusions and Recommendations

Based on the information provided EG&G concludes that the applicant has included most of the applicable hoists and cranes in their list of handling systems which must comply with the requirements of the general guidelines of NUREG-0612. EG&G recommends that the applicant include evaluation of cranes listed in Table 2.1 but not evaluated in their response to Section 2.1, Enclosure 3 of the NRC request for information. We also recommend a more thorough explanation of exclusion of the Spent Fuel Cask Handling Crane and the Spent Fuel Pool Bridge and Hoist.

TABLE 2.1 CRANE/HOIST SYSTEMS CONSIDERED AS POTENTIAL SOURCES FOR DAMAGE OF SAFETY COMPONENTS.

TAG NO.	HANDLING SYSTEM	CAPACITY	LOCATION
MS-CR-3	Polar Gantry Crane	420 Ton Main 50 Ton Auxiliary	Containment
FH-RE-24*	Radial Arm Stud Tensioner Hoists (3)	2 Tons	Containment
CS-CR-5	Filter Cask Monorail Hoist	4.5 Tons	Primary Auxiliary Building
CS-CR-6	Boric Acid Batching Monorail Hoist	4.5 Tons	Primary Auxiliary Building
CS-CR-13	CVCS Heat Exchanger Service Monorail Hoist	3.5 Tons	Primary Auxiliary Building
CS-CR-14A, 14B & 14C*	Charging Pump Service Monorail Hoist	2.5/2.5/6.0 Tons	Primary Auxiliary Building
CC-CR-15A & 15B	Component Cooling Water Pump Service Monorail Hoist	3 Tons	Primary Auxiliary Building
CBS-CR-18A & 18B*	Radioactive Pipe Tunnel Service Monorail Hoist	2 Tons	Radioactive Pipe Tunnel
MS-CR-25A & 25B*	Main Steam and Feedwater Pipe Chase Crane	7.5 Tons	MS and FW Pipe Chase
FW-CR-27	Emergency Feed Pump Monorail Hoist	4 Tons	Emergency Feed- water Pump Building
DC-CR-20A & 20B*	Diesel Generator Service Crane	9 Tons	Diesel Generator Building

* Systems not evaluated further in response to Section 2.1, Enclosure 3 of NRC request for information.

2.3 General Guidelines

This section addresses the extent to which the applicable handling systems comply with the general guidelines of NUREG-0612.

Article 5.1.1. EG&G's conclusions and recommendations are provided in summaries for each guideline.

The NRC has established seven general guidelines which must be met in order to provide the defense-in-depth approach for the handling of heavy loads. These guidelines consist of the following criteria from Section 5.1.1 of NUREG-0612:

- A. Guideline 1--Safe Load Paths
- B. Guideline 2--Load Handling Procedures
- C. Guideline 3--Crane Operator Training
- D. Guideline 4--Special Lifting Devices
- E. Guideline 5--Lifting Devices (not specially designed)
- F. Guideline 6--Cranes (Inspection, Testing, and Maintenance)
- G. Guideline 7--Crane Design.

These seven guidelines should be satisfied for all overhead handling systems and programs in order to handle heavy loads in the vicinity of the reactor vessel, spent fuel in the spent fuel pool, or in other areas where a load drop may damage safe shutdown systems. The succeeding paragraphs address the guidelines individually.

2.3.1 Safe Load Paths [Guideline 1, NUREG-0612, Article 5.1.1(1)]

"Safe load paths should be defined for the movement of heavy loads to minimize the potential for heavy loads, if dropped, to impact irradiated fuel in the reactor vessel and in the spent fuel pool, or to impact safe shutdown equipment. The path should follow, to the extent practical, structural floor members, beams, etc., such that if the load is dropped, the structure is more likely to withstand the impact. These load paths should be defined in procedures, shown on equipment layout drawings, and clearly marked on the floor in the area where the load is to be handled. Deviations from defined load paths should require written alternative procedures approved by the plant safety review committee."

A. Summary of Applicant Statements

The applicant has evaluated load path locations for Seabrook Station. The applicant states that load movement follows the safest and shortest route with the load as close to the floor as possible. Due to the nature of the load paths, the applicant states that marking the load paths on the floor is generally not feasible nor would it contribute to reactor safety.

B. EG&G Evaluation

The applicant response and drawings submitted indicates that Guideline 1 criteria have been partly satisfied at Seabrook Station. Load paths have been developed for all heavy loads which have been identified. However these load paths as represented on the submitted seem to be load-areas and not specific load paths. Also as indicated earlier no information is included for some systems and loads.

The applicant's position on the unfeasibility of marking load paths on the floor is not acceptable. EG&G does agree that for some areas and/or loads floor marking is not the best method for designating a load path, but for certain loads it may be the best method available.

Load path markings are meant to be used by load handling operators and their supervisors as a means for monitoring proper areas where movements of heavy loads will take place so that personnel not directly involved in load handling will be alerted to keep these pathways clear of non-related materials. By consolidating the various load paths, the applicant should be able to develop a systematic sequence of pathways for the movement of heavy loads to their lay-down or staging areas which is not overly complex or confusing to operators and supervisors, thus contributing to the general safety of plant personnel by minimizing interference with load handling operations. For some crane systems such as monorails the load paths are defined by the routing of the monorail and the marking necessary would be minimal.

C. EG&G Conclusions and Recommendations

EG&G concludes from the applicant's response that the Seabrook Station partially comply with Guideline 1.

In order to adhere to the criteria of this guideline, EG&G recommends that the applicant develop more specific load paths for all applicable systems and loads and clearly mark safe load paths on the floor or by some other means in areas where heavy loads are handled.

2.3.2 Load Handling Procedures [Guideline 2, NUREG-0612, Article 5.1.1(2)]

"Procedures should be developed to cover load handling operations for heavy loads that are or could be handled over or in proximity to irradiated fuel or safe shutdown equipment. At a minimum procedures should cover handling of those loads listed in Table 3-1 of NUREG-0612. These procedures should include: identification of required equipment; inspections and acceptance criteria required before movement of load; the steps and proper sequence to be followed in handling the load; defining the safe path; and other special precautions."

A. Summary of Applicant Statements

The applicant states that procedures will be developed to cover load handling operations for the heavy loads identified in Table 3.1.1 of NUREG-0612. These procedures will identify the required equipment, the inspection and acceptance criteria prior to load movement, the steps and sequence in handling the load and define the safe load path and other special precautions. They also state that approved procedures will be in effect prior to use of the load handling system.

B. EG&G Evaluation

The applicant has stated that load handling procedures will be developed which will comply with the requirements of Guideline 2. These guidelines should be available for possible review by the NRC prior to use of the load handling system.

C. EG&G Conclusions and Recommendations

The Seabrook Station do not presently comply with Guideline 2. In order to comply with the guideline the applicant should complete the development of load handling procedures for the applicable cranes and loads. These procedures should be available for possible NRC review prior to use of the load handling system.

2.3.3 Crane Operator Training [Guideline 3, NUREG-0612, Article 5.1.1(3)]

"Crane operators should be trained, qualified and conduct themselves in accordance with Chapter 2-3 of ANSI B30.2-1976, 'Overhead and Gantry Cranes' [5]."

A. Summary of Applicant Statements

The applicant states that Seabrook Station will comply with ANSI B30.2-1976 with respect to operator training, qualification, and conduct.

B. EG&G Evaluation

The applicant is developing a training and qualification program and appears to be implementing the applicable ANSI B30.2 requirements. No information on conduct was given by the applicant other than their statement that they will comply with ANSI B30.2-1976. This compliance should be complete before fuel loading occurs.

C. EG&G Conclusion and Recommendations

Based on the applicant's statement Seabrook Station will comply with Guideline 3. Procedures and program records should be readily available for possible review and inspection by the NRC staff.

2.3.4 Special Lifting Devices [Guideline 4, NUREG-0612, Article 5.1.1(4)]

"Special lifting devices should satisfy the guidelines of ANSI N14.6-1978, 'Standard for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials' [6]. This standard should apply to all special lifting devices which carry heavy loads in areas as defined above. For operating plants certain inspections and load tests may be accepted in lieu of certain material requirements in the standard. In addition, the stress design factor stated in Section 3.2.1.1 of ANSI N14.6 should be based on the combined maximum static and dynamic loads that could be imparted on the handling device based on characteristics of the crane which will be used. This is in lieu of the guideline in Section 3.2.1.1 of ANSI N14.6 which bases the stress design factor on only the weight (static load) or the load and of the intervening components of the special handling device."

A. Summary of Applicant Statements

The applicant identifies five (5) special lifting devices. The design of two (2) of these devices has not been finalized but the applicant states that an evaluation for compliance will be completed. The applicant states that the reactor coolant pump motor slings will comply with the guideline.

Special lifting devices for the reactor vessel head and upper internals have been provided by Westinghouse. They are being evaluated by Westinghouse for compliance with ANSI N14.16 and NUREG 0612, Section 5.1.1(4).

B. EG&G Evaluation

The applicant has identified five (5) special lifting devices. The information given on the design of these devices is inadequate for a comparison of the criteria used for design versus the requirements of Guideline 4. The applicant has stated that periodic testing will be performed to maintain continuing compliance in accordance with Section 5.2 of ANSI N14.6-1978.

C. EG&G Conclusions and Recommendations

Seabrook Station do not comply with Guideline 4. In order to satisfactorily comply with the criteria, the applicant should perform the following:

- (1) review, evaluate and report on the design and fabrication of all special lifting devices for which evaluation is not complete with respect to the requirements of ANSI N14.6-1978 and Guideline 4.

- (2) submit verification that procedures exist for all special lifting devices which satisfy the requirements of Section 5 (Acceptance Testing, Maintenance, and Assurance of Continued Compliance) of ANSI A14.6-1978.

Compliance with this guideline should be complete for each lifting device before they are used in a critical situation.

2.3.5 Lifting Devices (Not Specially Designed) [Guideline 5, NUREG-0612, Article 5.1.1(5)]

"Lifting devices that are not specially designed should be installed and used in accordance with the guidelines of ANSI B30.9-1971, 'Slings' [7]. However, in selecting the proper sling, the load used should be the sum of the static and maximum dynamic load. The rating identified on the sling should be in terms of the 'static load' which produces the maximum static and dynamic load. Where this restricts slings to use on only certain cranes, the slings should be clearly marked as to the cranes with which they may be used."

A. Summary of Applicant Statements

The applicant states that all lifting devices will meet the requirements of ANSI B30.9-1971 and Section 5.1.1(5) of NUREG 0612.

B. EG&G Evaluation

The applicant indicates that slings used at Seabrook Station will comply with the requirements of this guideline.

C. EG&G Conclusions and Recommendations

Seabrook Station will comply with Guideline 5.

2.3.6 Cranes (Inspection, Testing, and Maintenance)-[Guideline 6; NUREG-0612, Article 5.1.1(6)]

"The crane should be inspected, tested, and maintained in accordance with Chapter 2-2 of ANSI B30.2-1976, 'Overhead and Gantry Cranes,' with the exception that tests and inspections should be performed prior to use where it is not practical to meet the frequencies of ANSI B30.2 for periodic inspection and test, or where frequency of crane use is less than the specified inspection and test frequency (e.g., the polar crane inside a PWR containment may only be used every 12 to 18 months during refueling operations, and is generally not accessible during power operation. ANSI B30.2, however, calls for certain inspections to be performed daily or monthly. For such cranes having limited usage, the inspections, test, and maintenance should be performed prior to their use)."

A. Summary of Applicant Statements

A program will be developed to insure that cranes will be inspected, tested and maintained in accordance with Chapter 2-2 of ANSI B30.2-1976. Frequency of tests and inspections will comply with Section 5.1.1(6) of NUREG 0612.

B. EG&G Evaluation

The applicant states that crane inspection, testing, and maintenance programs will comply with ANSI B30.2-1976 with exceptions as allowed by Guideline 6.

C. EG&G Conclusions and Recommendations

Seabrook Station will comply with Guideline 6 on the basis of the applicant's statement. The applicant should submit verification that the above mentioned programs are in place prior to fuel loading.

2.3.7 Crane Design [Guideline 7, NUREG-0612, Article 5.1.1(7)]

"The crane should be designed to meet the applicable criteria and guidelines of Chapter 2-1 of ANSI B30.2-1976, 'Overhead and Gantry Cranes,' and of CMAA-70, 'Specifications for Electric Overhead Traveling Cranes' [8]. An alternative to a specification in ANSI B30.2 or CMAA-70 may be accepted in lieu of specific compliance if the intent of the specification is satisfied."

A. Summary of Applicant Statements

The polar gantry crane and spent fuel cask handling crane were designed in accordance with the CMAA-70 and ANSI B30.2-1967. Monorails and underhung cranes are designed to ANSI B30.11 and B30.16.

B. EG&G Evaluation

The cranes mentioned by the applicant in their response comply with or meet the intent of Guideline 7 based on the applicant's statements.

C. EG&G Conclusions and Recommendations

Seabrook Station partially complies with Guideline 7 on the basis of the applicant's statements. Additional information may be needed on cranes not mentioned in this response.

3. CONCLUDING SUMMARY

3.1 Applicable Load Handling Systems

The list of cranes and hoists supplied by the applicant as being subject to the provisions of NUREG-0612 is not adequate (see Section 2.2.1). Information on all applicable cranes was not included in the applicant's response.

3.2 Guideline Recommendations

Compliance with the seven NRC guidelines for heavy load handling (Section 2.3) are partially satisfied at Seabrook Station. This conclusion is represented in tabular form as Table 3.1. Specific recommendations to aid in compliance with the intent of these guidelines are provided as follows:

<u>Guideline</u>	<u>Recommendation</u>
1. (Section 2.3.1)	a. Provide safe load paths for all applicable cranes and clearly mark safe load paths on the floor or by some other means.
2. (Section 2.3.2)	a. Complete development of load handling procedures.
3. (Section 2.3.3)	a. Operator training records, and programs should be available for NRC review or inspection.
4. (Section 2.3.4)	a. Fully review evaluate and report on the design and fabrication of special lifting devices with respect to ANSI N14.6 b. Submit verification that continued testing of special lifting devices will comply with ANSI N14.6.
5. (Section 2.3.5)	a. Seabrook will comply with this guideline

Guideline

Recommendation

6. (Section 2.3.6)

a. Submit verification that crane inspection, testing, and maintenance programs have been implemented.

7. (Section 2.3.7).

a. Seabrook partially complies with this guideline. Additional information needed on cranes not included.

4. REFERENCES

1. NUREG-0612
Control of Heavy Loads at Nuclear Power Plants
NRC
2. V. Stello, Jr. (NRC)
Letter to all applicants. Subject: Request for Additional
Information on Control of Heavy Loads Near Spent Fuel
NRC, 17 May 1978
3. USNRC
Letter to Public Service Company of New Hampshire. Subject: NRC
Request for Additional Information on Control of Heavy Loads Near
Spent Fuel
NRC, 22 December 1980
4. Public Service Company of New Hampshire
Letter to Director of Nuclear Regulatory Regulation.
Subject: Response to NRC Request for Additional Information on
Control of Heavy Loads, September 1982
5. ANSI B30.2-1976
"Overhead and Gantry Cranes"
6. ANSI N14.6-1978
"Standard for Lifting Devices for Shipping Containers Weighing
10,000 Pounds (4500 kg) or more for Nuclear Materials"
7. ANSI B30.9-1971
"Slings"
8. CMAA-70
"Specifications for Electric Overhead Traveling Cranes"

Table 3.1

Equipment Designation	Heavy Loads	Weight or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane - Test and Inspection	Guideline 7 Crane Design
	New Fuel Assembly	0.9			I	I			
	Crane Load Block (125 Ton)	3				--			
	Irradiated Specimen Cask					I			
	Failed Fuel Container					I			
Filter Cask Monorail Hoist CS-CR-5		4.5	C	R/I	R/I	--	C	R/C	C
	Filter Cask (CVCS system)	3.5				I			
	Concrete Floor Plug	1.5				--			
Boric Acid Batching Monorail Hoist		4.5	C	R/I	R/I	--	C	R/C	C
	Hatch Cover (2 sections)	0.7							
	Pallets of Boric Acid	4.5							
CVCS Heat Exchanger Service Monorail Hoist CS-CR-13		3.5	C	R/I	R/I	--	C	R/C	C
	Removable Concrete Floor Plug (2 sections)	3.3							
	Heat Exchanger Tube Bundle	1.1							

C = Licensee action complies with NUREG-0612 Guideline.

NC = Licensee action does not comply with NUREG-0612 Guideline.

R = Licensee has proposed revisions/modifications designed to comply with NUREG-0612 Guideline.

I = Insufficient information provided by the Licensee.

Table 3.1

Equipment Designation	Heavy Loads	Weight or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane - Test and Inspection	Guideline 7 Crane Design
Charging Pump Service Monorail Hoist CS-CR-14A, 14B & 14C		2.5/2.5/6.0	I	R/I	R/I	--		R/C	I
Component Cooling Water Pump Service Monorail Hoist CC-CR-15A & 15P		3	C	R/I	R/I	--	C	R/C	C
	Primary Component Cooling Water Pump	1.6							
	PCCW Pump Motor	2.6							
Radioactive Pipe Tunnel Service Monorail Hoist CBS-CR-10A & 10B		2	I	R/I	R/I	--	C	R/C	I
Main Stream and Feed-water Pipe Chase Crane MS-CR-25A & 25B		7.5	I	R/I	R/I	--	C	R/C	I
Emergency Feed Pump Monorail Hoist FW-CR-27		4	C	R/I	R/I	--	C	R/C	C
	Emergency Feed-water Pump	2.9							
	Emergency Feed-water Pump Motor	2.4							
	Emergency Feed-water Pump Turbine	2.0							
	6'-0" x 4'-6" Removable Concrete Floor Plug	2.0							
Diesel Generator Service Crane DG-CR-28A & 28B		0	I	R/I	R/I	--	C	R/C	I

C = Licensee action complies with NUREG-0612 Guideline.

NC = Licensee action does not comply with NUREG-0612 Guideline.

R = Licensee has proposed revisions/modifications designed to comply with NUREG-0612 Guideline.

I = Insufficient information provided by the licensee.

Table 3:1

Equipment Designation	Weight or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane - Test and Inspection	Guideline 7 Crane Design
Polar Gantry Crane M-CR-3	420 Main 50 Aux	NC	R/I	R/I	--	C	R/C	C
Neutron Shield Panel (8)	5				--			
Reactor Cavity Seal Ring	9.3				--			
Reactor Missile Shield and Support (plus CRDM cooling fans)	20				I			
CRDM Cooling Air Duct and Supports Heaviest Section					--			
Reactor Vessel Head and Attachments	160				I			
Internals Lifting Rig	9.1				I			
Upper Internals	76				I			
Lower Internals	170				I			
Jib Crane (including hoist and trolley)	1.5				--			
Stud Tensioners	1.25				--			
RC Pump Motor	50				--			
RC Pump Motor Support	4.7				C			
RC Pump Internals	22.5				--			
RC Pump Assembly (including casing)	47.2				--			

C = Licensee action complies with NUREG-0612 Guideline.
 NC = Licensee action does not comply with NUREG-0612 Guideline.
 R = Licensee has proposed revisions/modifications designed to comply with NUREG-0612 Guideline.
 I = Insufficient information provided by the Licensee.

Table 3.1

Equipment Designation	Heavy Loads	Weight or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane - Test and Inspection	Guideline 7 Crane Design
	RC Pump Removable Concrete Plugs (2 sections)	18.5			8	--			
	RC Pump Handling Frame	5				--			
	Plug for In-Core Detector Drive	5				--			
	420 Ton Hoist Load Block	15				--			
	50 Ton Hoist Load Block	1				--			
	In-Service Inspection Tool					--			
	Miscellaneous Equipment in Containment Annulus Area					--			
	Pressurizer Missile Shield	2.5				--			
	Equipment Hatch Cover (including airlock)	42.6				--			
Radial Arm Stud Tensioner Hoists FI-RE-24		1	I	R/I	R/I	--	C	R/C	I
Spent Fuel Cask Handling Crane FI-RE-1		125 Main 5 Aux	NC	R/I	R/I	--	C	R/C	C
	Spent Fuel Cask	--				I			
	New Fuel Shipping Container	3.4				I			

C = Licensee action complies with NUREG-0612 Guideline.

NC = Licensee action does not comply with NUREG-0612 Guideline.

R = Licensee has proposed revisions/modifications designed to comply with NUREG-0612 Guideline.

I = Insufficient information provided by the Licensee.