

CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS
WM. H. ZIMMER NUCLEAR POWER STATION

Docket No. [50-358]

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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 Wm. H. Zimmer Nuclear Power Station.

EXECUTIVE SUMMARY

Wm. H. Zimmer Nuclear Power Station does not totally comply with the guidelines of NUREG-0612. In general, compliance is insufficient in the following areas:

- o identification of heavy loads, (what is the weight of a fuel assembly and its handling tools)
- o sling construction details for safety analysis (ANSI B30.9 Sections 9-2.2.1 and 9-2.2.2)
- o plans for physical identification of heavy load paths in the plant area when a heavy load is handled
- o status of crane testing and maintenance
- o lifting device evaluation to verify their adequacy for static and dynamic loading
- o interim protective measure analysis.

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

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TECHNICAL EVALUATION REPORT
FOR
WM. H. ZIMMER NUCLEAR POWER STATION
(Cincinnati Gas and Electric Company)

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 the Cincinnati Gas and Electric Company, Wm. H. Zimmer Nuclear Power Station. 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 licensees, 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 cover adequately 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 Cincinnati Gas and Electric Company, the Licensee for Wm. H. Zimmer Nuclear Power Station requesting that the Licensee review provisions for handling and control of heavy loads at Wm. H. Zimmer Nuclear Power Station, 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. On May 13, 1981, Cincinnati Gas and Electric Company provided a response [4] to this request. On June 24, 1981 a second response [5] was submitted with supplemental information, on which the evaluation and recommendations here are made.

2. EVALUATION AND RECOMMENDATIONS

2.1 Overview

The following sections summarize Cincinnati Gas and Electric Company's review of heavy load handling at the Wm. H. Zimmer Nuclear Power Station accompanied by EG&G's evaluation, conclusions and recommendations to the licensee for bringing the facilities more completely into compliance with the intent of NUREG-0612. The licensee has not indicated the weight of the power stations single spent fuel assembly and its handling tool, which is the criteria listed in NUREG-0612 for classification as a heavy load. Therefore the average BWR fuel assembly weight of 1100 pounds will be considered to be a Wm. H. Zimmer Nuclear Power Station, heavy load.

2.2 Heavy Load Overhead Handling Systems

This section reviews the licensee'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 Licensee Statements

The Licensee's review of overhead handling systems provided a Table which identified the cranes and hoists which handle heavy loads in the vicinity of irradiated fuel or safe shutdown equipment.

The Licensee report identified numerous other cranes that have been excluded from satisfying the criteria of the general guidelines of NUREG-0612. The exclusions were made because the licensee verifies that there is sufficient physical separation from any load impact point to any safety related component.

B. EG&G Evaluation

Information included in the Licensee's response reveals at least fifty-two hoisting units on plant equipment removal drawings. The twenty-eight hoisting units the licensee listed for consideration was reduced by individually justifying removal of ten on specific grounds and three additional hoists because their capacities are incapable of handling heavy loads.

The justifications given for the hoisting items removed cannot be verified from data in the report.

C. EG&G Conclusions and Recommendations

Since there is no information to the contrary EG&G must conclude that the Licensee has included all applicable hoists and cranes in their list of handling systems which must comply with the requirements of the general guidelines of NUREG-0612. However, EG&G does recommend that the Licensee be prepared to verify the justification for the exclusion of cranes and hoists from their list if it becomes necessary.

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, near 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 Licensee Statements

The report submitted states, "Equipment removal paths have been identified and are shown on the equipment removal plans. Particular drawings for each load handling system are being developed from these equipment removal plans."

B. EG&G Evaluation

The paths identified have been shown on the equipment removal plans. Development of additional drawings and actions to meet the other five details for "Safe Load Paths" are not addressed in this report by the licensee.

C. EG&G Conclusions and Recommendations

It is concluded from the information reported that actual work is started only. The licensee should continue the required development work on the items listed below:

- (1) Definition of load paths for each hoist involved
- (2) Develop auditable information that shows the safe load paths follow structural floor members, beams, etc., so far as possible
- (3) Assure that safe load paths are adequately defined in procedures issued for guidance for control of, "Heavy Loads"

- (4) Include in procedures the method to clearly mark on floors or otherwise identify the area (load paths) where loads shall be handled, when fuel or special lifts are to be made
- (5) Develop a procedural plan that requires written alternative plans and appropriate approvals before allowing deviations from regular procedures that guide control of heavy loads.

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 3.1-1 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 Licensee Statements

Administrative controls are being developed and shall be in place prior to initial fuel loading. The administrative controls shall require specific implementing procedures for the handling of heavy loads over or in close proximity to irradiated fuel on the plant refueling floor. These implementing procedures shall include; identification of required equipment, any inspections required before load movement, and the handling sequence to be followed including a drawing of the equipment removal path.

B. EG&G Evaluation

There is nothing to be evaluated as the statement indicates that, "controls are being developed."

C. EG&G Conclusions and Recommendations

- (1) Assure that the control procedures being developed include other special precautions as may be necessary
- (2) The licensee should have the control procedures prepared, approved, in service and suitable for an audit before fuel handling is permitted.

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' [6]."

A. Summary of Licensee Statements

All personnel who operate cranes or hoists at the Wm. H. Zimmer Nuclear Power Station have received documented classroom training in the areas of rigging, lifting, hand signals and rigging inspection. In addition, personnel who operate cab-operated cranes have received hands-on training on such equipment during the preoperational testing programs at the plant.

B. EG&G Evaluation

The statement indicates that progress has been made toward compliance with requirements of ANSI B30-2 Chapter 2-3. The quality of training, its adequacy, operator physical

conditions and conduct of operations cannot be evaluated from the statement alone.

C. EG&G Conclusion and Recommendations

- (1) The licensee should be prepared to verify, upon audit, that their operators meet the specified requirements.

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' [7]. 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 Licensee Statements

The licensee report discusses two strongbacks that need to conform to ANSI N14.6 as special lifting devices. These are a reactor head strongback listed by nameplate data at 80 ton capacity, and a dryer/separator strongback at 60 ton hook block capacity. Details of construction were in accordance with General Electric Co. design, and the licensee is attempting to obtain detailed design data from GE. Information presently established is that "Proof Tests were made at 100 ton and 104 ton respectively on the strongbacks. Structural welds were magnetic particle

inspected and welders and procedures were qualified to ASME Boiler and Pressure Vessel Code Section IX.

B. EG&G Evaluation

There is insufficient information to determine whether or not additional lifting devices should be included in the category of, "Special Lifting Devices" at Wm. H. Zimmer Nuclear Power Station. They should be able to verify, upon audit, that no other special lifting devices are used.

The term "Proof Test" is not specific in meaning. A designer usually specifies what constitutes a valid proof test based on the service planned for the equipment. This is done before the equipment is accepted for use. The requirements of ANSI N14.6 specify an acceptance test, prior to use, of 150% of the maximum load. The reactor head load is reported to be 65 tons but it is not clear whether the strongback, shackles, turnbuckles, etc., are, or are not included in the load. The requirement of ANSI N14.6 sets the criteria that must be met. The reactor head strongback loading is very close to maximum for the acceptance. All details should be obtained and considered.

C. EG&G Conclusions and Recommendations

Pursue the collection of correct design criteria until it is obtained for the special lifting devices. When obtained, evaluate both strongbacks to assure that each meets the ANSI N14.6 requirements. If compliance discrepancies are identified proceed with establishing acceptable alternates allowed in NUREGs 0612.

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' [8]. 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 Licensee Statements

The primary statement made by the licensee is, "The rigging equipment listed in the licensee's Table 2 satisfies the requirements of ANSI B30.9. The rigging slings were selected with a minimum design capacity of 110% of the static load. Based upon a maximum hoisting speed of 5.5 ft/min, the 10% margin is deemed adequate for the applied dynamic loads."

The data provided in the licensee's Table 2 identifies fifteen loads including the two special devices included above in 2.3.4. The table gives the load weight and basic data on the lifting device and a reference to a controlling document (not provided). The table applies only to loads handled on the plant refueling floor. Other loads are, "... administratively controlled through the station work request."

B. EG&G Evaluation

The general selection criteria of, "110% of the static load" fails to provide sufficient information to determine if the slings satisfy the requirements of ANSI B30.9. Comparing the data given with Sections 9-2.2.1 and 9-2.2.2 of the

ANSI Code reveals numerous needed details that are not provided. The assumption that a maximum hoisting speed of 5.5 feet per minute with a 10% margin for applied dynamic loading appears sufficient for the largest load, once the 110% design capacity is verified.

C. EG&G Conclusions and Recommendations

- (1) It is concluded that the statement, "the rigging satisfied the requirements of ANSI B30.9" leaves many details that the licensee should be able to verify to a field auditor. Recommendations concerning refueling floor lifting devices shown in the Licensee's report are given in (2) below. General recommendations in (3) below relate to lifting devices used for handling heavy loads in other areas of the plant.
- (2) Some of the information given by the licensee on lifting devices used in the refueling floor area indicate sizes larger than those listed in ANSI B30.9. Also, one shackle appears to be undersized and several slings would be adequate only when used with very small deviation angles from the vertical. The licensee should collect suitable supporting information on the lifting devices that verifies that the device provides the required safety factor of five for the combined static and dynamic load.
- (3) Devices for handling heavy loads in other areas of the plant are mentioned collectively without details. The reference to, "administratively controlled through the station work request," does not satisfy the NUREG requirement. The licensee should be able to verify the following: the hoist travel speeds in feet per second, the sling construction and type, the sling leg angles

as used, method of eye attachment (for wire rope slings) and that the recommended safe working load is based upon the combined static and dynamic load.

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 Licensee Statements

All cranes at the Wm. H. Zimmer Nuclear Power Station, which are under control of the Electric Production Department, are periodically inspected as required by ANSI B30.2.0. All cranes are designated as either regular or standby service. Cranes used more than twice a week are designated as regular use. All cranes and hoists undergo a before use inspection. All regular use cranes or standby use cranes being operated regularly for more than a month, undergo a documented monthly inspection. All cranes undergo a yearly documented inspection.

B. EG&G Evaluation

The licensee statement is given in its entirety. It indicates inspection meets requirements of ANSI B30.2. No

actual detail of the inspections are given. Also no information or statements are made to report the program for testing or maintenance.

C. EG&G Conclusions and Recommendations

There is insufficient information to evaluate the adequacy of inspections. If they are in fact meeting the ANSI B30.2 requirements adequate records should be maintained to verify this upon audit. Records should be provided to verify that testing and maintenance comply with ANIS B30.2, Chapter 2-2.

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' [9]. 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 Licensee Statements

As described in the Wm. H. Zimmer Nuclear Power Station Final Safety Analysis Report, the Reactor Building crane is designed per the requirements of ANSI B30.2.0 and CMAA-70. Other overhead hoists installed at the Zimmer Station are specified to meet the requirements of ANSI B30.16, overhead hoists.

B. EG&G Evaluation

The above statement and whether some small hoists are electrical, chain or manual operated is the only data on construction or design given in the report.

C. EG&G Conclusion and Recommendation

The licensee should maintain suitable data to verify that the Reactor Building Crane meets the design requirements of ANSI B30.2 1976 and CMAA-70.

The use of ANSI B30.16 crane design for monorail hoists is acceptable. Since CMAA 70 does not apply to this type of hoist there appears to be adequate compliance with guideline 7 for the monorail hoists.

2.4 Interim Protection Measures

The NRC staff has established (NUREG-0612, Article 5.3) that six measures should be initiated to provide reasonable assurance that handling of heavy loads will be performed in a safe manner until final implementation of the general guidelines of NUREG-0612, Article 5.1 is complete. Four of these six interim measures consist of general Guideline 1, Safe Load paths; Guideline 2, Load Handling Procedures; Guideline 3, Crane Operator Training; and Guideline 6, Cranes (Inspection, Testing, and Maintenance). The two remaining interim measures cover the following criteria:

- o Heavy load technical specifications
- o Special review for heavy loads handled over the core.

Licensee implementation and evaluation of these interim protection measures is contained in the succeeding paragraphs of this section.

2.4.1 Interim Protection Measure 1 - Technical Specifications

"Licenses for all operating reactors not having a single-failure-proof overhead crane in the fuel storage pool area should be revised to include a specification comparable to

Standard Technical Specification 3.9.7, 'Crane Travel - Spent Fuel Storage Pool Building,' for PWR's and Standard Technical Specification 3.9.6.2, 'Crane Travel,' for BWR's, to prohibit handling of heavy loads over fuel in the storage pool until implementation of measures which satisfy the guidelines of Section 5.1."

A. Summary of Licensee Statements

No discussion or statement is made concerning the fuel storage pool equipment.

B. EG&G Evaluation

None. The Wm. H. Zimmer Nuclear Power Station is not operational at present.

C. EG&G Conclusions and Recommendations

Interim Protection Measure 1 should be recognized and addressed, as appropriate for the Wm. H. Zimmer Nuclear Power Station prior to handling spent fuel.

2.4.2 Interim Protection Measures 2, 3, 4, and 5 - Administrative Controls

"Procedural or administrative measures [including safe load paths, load handling procedures, crane operator training, and crane inspection]... can be accomplished in a short time period and need not be delayed for completion of evaluations and modifications to satisfy the guidelines of Section 5.1 of [NUREG-0612]."

A. Summary of Licensee Statements

Summaries of Licensee statements are contained in discussions of the respective general guidelines in Sections 2.3.1, 2.3.2, 2.3.3, and 2.3.6, respectively.

B. EG&G Evaluations, Conclusions, and Recommendations

EG&G evaluations, conclusions, and recommendations are contained in discussions of the respective general guidelines in Sections 2.3.1, 2.3.2, 2.3.3, and 2.3.6.

2.4.3 Interim Protection Measure 6--Special Review for Heavy Loads Over the Core

"Special attention should be given to procedures, equipment, and personnel for the handling of heavy loads over the core, such as vessel internals or vessel inspection tools. This special review should include the following for these loads: (1) review of procedures for installation of rigging or lifting devices and movement of the load to assure that sufficient detail is provided and that instructions are clear and concise; (2) visual inspections of load bearing components of cranes, slings, and special lifting devices to identify flaws or deficiencies that could lead to failure of the component; (3) appropriate repair and replacement of defective components; and (4) verify that the crane operators have been properly trained and are familiar with specific procedures used in handling these loads, e.g., hand signals, conduct of operations, and content of procedures."

A. Summary of Licensee Statements

No specific statements are made relative to interim protective measures. The references made concern planned general operations and are aimed at actions that will be taken or are in planning. Controlling documents listed in their report are not provided or indicated whether functional or under development.

B. EG&G Evaluation

There is no information to evaluate on Interim Protection measures.

C. EG&G Conclusion

The licensee should distinguish which if any heavy load handling activities are below the standards specified in the guidelines of NUREG-0612. Then establish the required interim protective measures.

3. CONCLUDING SUMMARY

3.1 Applicable Load Handling Systems

The list of cranes and hoists supplied by the Licensee as being subject to the provisions of NUREG-0612 is probably adequate (see Section 2.2.1). However, EG&G does recommend that a more thorough justification be provided for excluding those cranes which are not included.

3.2 Guideline Recommendations

Compliance with the seven NRC guidelines for heavy load handling (Section 2.3) are partially satisfied at the Wm. H. Zimmer Nuclear Power 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)	<ul style="list-style-type: none">a. Continue the required development work to meet the guideline for Safe Load paths.b. Assure that each of five requirements are adequate and suitable for audit.
2. (Section 2.3.2)	<ul style="list-style-type: none">a. Expedite completion of the load handling procedures.

Guideline

Recommendation

- b. Assure the procedures are approved and in service before fuel handling is permitted.
- 3. (Section 2.3.3)
 - a. Be prepared to show that operators are adequately trained for safe handling of heavy loads.
- 4. (Section 2.3.4)
 - a. Obtain the design criteria for the special lifting devices and evaluate it to determine if the requirements of ANSI N14.6 are complied with. If not proceed with establishing acceptable alternates.
- 5. (Section 2.3.5)
 - a. Conduct a much more thorough evaluation of lifting devices to assure that the many detailed requirements of ANSI B30.9 are complied with.
 - b. Assure that each device is suitable for both the static and dynamic stresses applied in the method it is being used.

6. (Section 2.3.6)

- a. Provide adequate information and records on each crane to show that specified inspection, testing, and maintenance, is performed.

7. (Section 2.3.7)

- a. Maintain data that verifies that the reactor building crane meets the design requirements of ANSI B30.2 and CMAA-70.
- b. Establish records to verify adequacy of those monorail hoists in the plant that are designed to ANSI B30.16 requirements.

3.3 Interim Protection

EG&G's evaluation of information provided by the Licensee indicates that the following actions are necessary to ensure that the six NRC staff measures for interim protection at Wm. H. Zimmer Nuclear Power Station are met:

<u>Interim Measure</u>	<u>Recommendation</u>
None indicated	Evaluate the technical specification to determine what is needed and the appropriate action to assure compliance with requirements before plant startup.

4. REFERENCES

1. NUREG-0612
Control of Heavy Loads at Nuclear Power Plants
NRC
2. V. Stello, Jr. (NRC)
Letter to all licensees. Subject: Request for Additional Information
on Control of Heavy Loads Near Spent Fuel
NRC, 17 May 1978
3. USNRC
Letter to [Company]. Subject: NRC Request for Additional Information
on Control of Heavy Loads Near Spent Fuel
NRC, 22 December 1980
4. E. A. Borgman
Letter to Mr. Harold Denton, U.S. Nuclear Regulatory Commission,
Washington, DC 20555, dated May 13, 1981, Referencing Wm. H. Zimmer
Nuclear Power Station Unit 1 - Control of Heavy Loads.
5. E. A. Borgman
Letter to Mr. Harold Denton, U.S. Nuclear Regulatory Commission,
Washington, DC 20555, dated June 24, 1981, referencing Wm. H. Zimmer
Nuclear Power Station Unit 1 - Supplemental Information in response to
NRC Letter of December 22, 1980 regarding Control of Heavy Loads.
6. ANSI B30.2-1976
"Overhead and Gantry Cranes"
7. ANSI N14.6-1978
"Standard for Lifting Devices for Shipping Containers Weighing
10,000 Pounds (4500 kg) or more for Nuclear Materials"

8. ANSI B30.9-1971

"Slings"

9. CMAA-70

"Specifications for Electric Overhead Traveling Cranes"

TABLE 3.1. WM. H. ZIMMER NUCLEAR POWER STATION NUREG-0612 COMPLIANCE MATRIX

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
101 main	14 loads to 90 Ton Max.	110	W-1	W	C	I	W-1	I	C
101 aux	2 loads to 4 Ton Max.	10	W-1	W	C		W-1	I	I
105	2900 lbs	2		W	C		W-1	I	I
107		20	Exemption		C		W-1	I	I
108	18.5 Ton	18	W-1	W	C		W-1	I	I
109	23.8 Ton	24.45	W-1	W	C		W-1	I	I
111	2 Ton	15	W-1	W	C		W-1	I	I
112	7 Ton	20	W-1	W	C		W-1	I	I
114	1 Ton	2.5	W-1	W	C		W-1	I	I
116	5 Ton	6	W-1	W					
118	3.5 Ton	4	W-1	W	C		W-1	I	I
119	3 Ton	4	W-1	W	C		W-1	I	I
120		15	Exemption						
121		4	Exemption						
122		2	Exemption						
123		2	Exemption						
124		2	Exemption						
126		1.5	Exemption		C		W-1	I	I
128	5 Ton	5	W-1	W					
203		1	Future						
204		5	Future						
412		8	W-1	W	C		W-1	I	I
417	3 Ton	3	W-1	W	C		W-1	I	I
418	2 Ton	3	W-1	W					
102, 103, 104, 106, 110, 113, 115, 117, 125, 127, 202, 205, 207, 301, 302, 303, 304, 305, 306, 307, 308, 309, 401, 402, 403, 404, 405, 406, 411, 413, 415, 416, and 419.									
		Noted on drawings provided.							
		Excluded on the basis of location.							

C = licensee action complies with NUREG-0612 Guideline.

W = 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.

W = work in progress indicated.