EGG-HS-6264
APRIL 1983

CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
PERRY NUCLEAR POWER PLANT, UNITS 1 AND 2 (PHASE I)

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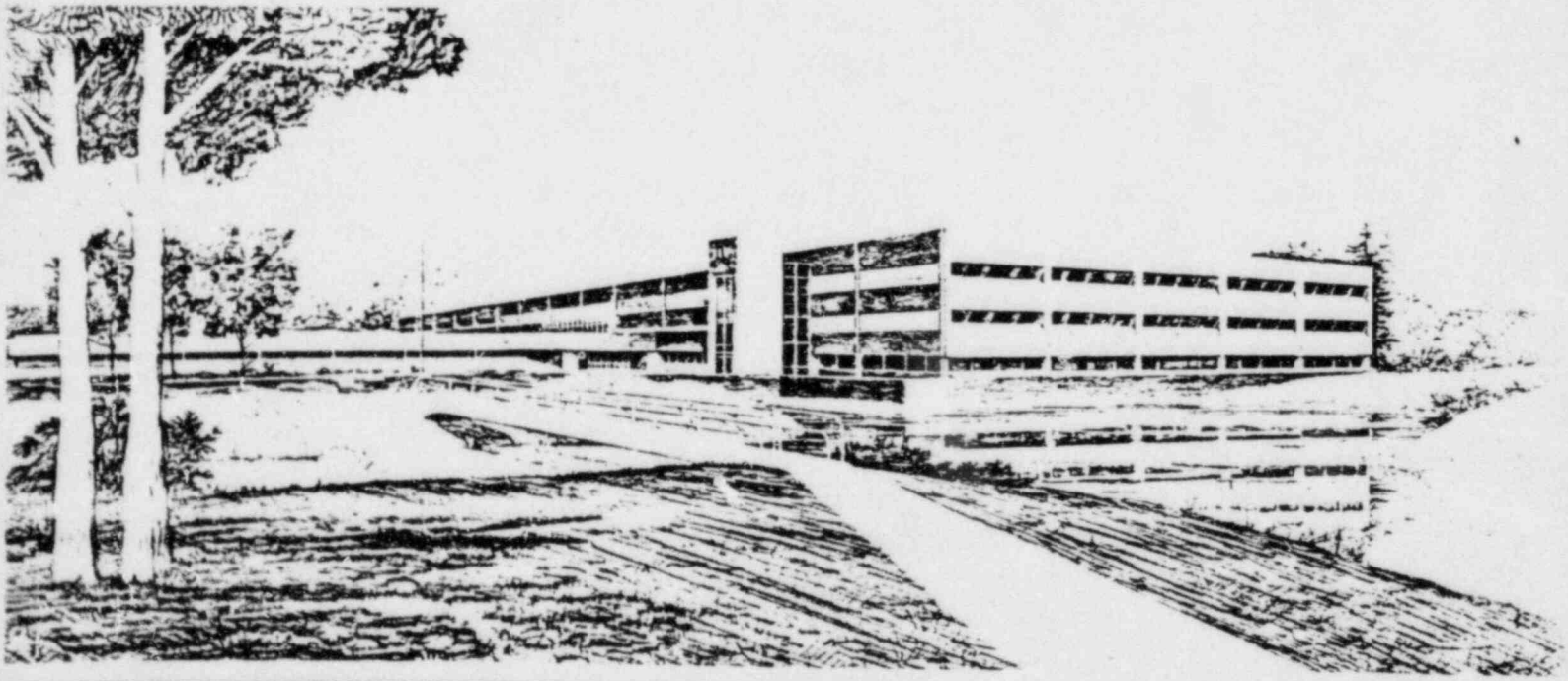
Operated by the U.S. Department of Energy



This is an informal report intended for use as a preliminary or working document

Prepared for the
U.S. NUCLEAR REGULATORY COMMISSION
Under DOE Contract No. DE-AC07-76ID01570
FIN NO. A6457

EG&G Idaho

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(PHASE I)

Docket Nos. 50-440 and 50-441

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Published April 1983

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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 final report is a result of EG&G's review of the responses submitted for the Perry Nuclear Power Plant, Units 1 and 2 to the requirements of Section 5.1.1 of NUREG-0612 (Phase I). Sections 5.1.2, 5.1.4, 5.1.5, and 5.1.6 (Phase II) will be covered in a separate report.

EXECUTIVE SUMMARY

Perry Nuclear Power Plant, Units 1 and 2 comply with the intent of the equirements of NUREG-0612.

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TABLES

CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS
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PERRY NUCLEAR POWER PLANT, UNITS 1 AND 2
(PHASE I)

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 Cleveland Electric Illuminating Company (CEICO), Perry Nuclear Power Plant, Units 1 and 2. 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 (a) 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 (b) 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:

- Provide sufficient operator training, handling system design, load-handling instructions, and equipment inspection to assure reliable operation of the handling system

- 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

- 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 Cleveland Electric Illuminating Company, the applicant for the Perry Nuclear Power Plant, Units 1 and 2, requesting that the applicant review provisions for handling and control of heavy loads at PNPP Units 1 and 2, 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 June 19, 1981, CEICo provided the initial response [4] to this request. Based on this information, a preliminary draft of this report was prepared and discussed with the applicant. Additional information was provided by the applicant in References [9, 10, 11]. The current (final) draft of this report was prepared from information contained in all these submittals.

2. EVALUATION AND RECOMMENDATIONS

2.1 Overview

The following sections summarize CEICo's review of heavy load-handling at Perry Nuclear Power Plant, Units 1 and 2 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 applicant has indicated the weight of a heavy load for this facility (as defined in NUREG-0612, Article 1.2) as 1048 pounds.

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's Statements

The applicant conducted a review of plant arrangements and provided tables and drawings in Reference 10 identifying

cranes, hoists, or other overhead handling devices that have the capacity to lift more than 1048 pounds in buildings housing fuel or safe shutdown equipment. Separate tables were presented for each handling system. The tables included the impact area, loads and weights to be lifted, safety-related equipment, floor elevation, category for hazard elimination, and capacity of the handling system. Hazard elimination categories were defined and justification for the load classification was provided. The overhead handling systems used for the heavy load movements are identified in Table 2.1. All overhead handling systems excluded from further concern are listed on Table 2.2.

B. EG&G Evaluation

The applicant's response to the identification of overhead handling systems is very complete and well documented in Reference [10]. The drawings in this reference indicate that a notable amount of handling is accomplished by dollies, however, the applicant states that they will not be pulled by cranes [11]. EG&G is in agreement with the logic chart used as a basis for evaluation and analysis of the movement of heavy loads and commends CEICo's method of clear presentation. Tables 2.3, 2.4, and 2.5 identify weights, lift equipment, procedures, and analysis for loads that are to be handled by the Overhead Handling Systems icentified in Table 2.1.

C. EG&G Conclusions and Recommendations

The Perry Nuclear Power Plants, Units 1 and 2 comply with the requirements of 2.2.1 above, of NUREG-0612 on Heavy Load Overhead Handling Systems.

TABLE 2.1. OVERHEAD HANDLING SYSTEMS USED FOR THE MOVEMENT OF HEAVY LOADS IN VICINITY OF SAFE SHUTDOWN EQUIPMENT PERRY, NUCLEAR POWER PLANT, UNITS 1 AND 2

Handling System	Capacity (lb)	Location
Emergency Service Water Pump House Crane	30,000	ESW Pump House
Reactor Building Crane	250,000	Reactor Building
Fuel-Handling Building Crane	250,000	Fuel-Handling Building

TABLE 2.2 OVERHEAD HANDLING DEVICES EXCLUDED FROM FURTHER CONCERN PERRY NUCLEAR POWER PLANT UNITS 1 and 2

Handling System	Capacity (lbs)	Location	*Hazard Elimination Category
Hoist 33-1, 33-2	30,000	Reactor Auxiliary Building	A
Hoist 34-1, 34-2	15,000	Reactor Auxiliary Building	A, B
Hoist 35-1, 35-2	30,000	Reactor Auxiliary Building	A, B
Hoist 42-A, B	1,048	Fuel Handling	NA
Hoist 43	8,000	Unit 2 Reactor Building	B, C
Hoist 44	70,000	Unit 1 Reactor Building	B, C
Hoist 45-1, 45-2	70,000	Reactor Building Annulus	B, C
Hoist 49-1, 49-2	6,000	Reactor Building	B, C
Hoist 50-1, 50-2	6,000	Reactor Building and Intermediate Building	B, C
Hoist 51-1, 52-2	10,000	Reactor Building	B, C
Hoist 58	8,000	Control Complex	A, B
Hoist 59	8,000	Control Complex	A, B
Hoist 60	8,000	Control Complex	A, B
Fuel Handling Machine	1,000	Fuel Handling Building	B
Hoist 36	12,000	Intermediate Building	B
Hoist 37-1, 37-2	30,000	Auxiliary Building	A, B
Hoist 38-1, 38-2	15,000	Auxiliary Building	A, B
Hoist 39-1, 39-2	30,000	Auxiliary Building	A, B
Hoist 40-1, 40-2	20,000	Auxiliary Building	A, B
Hoist 41-1, 41-2	20,000	Fuel Handling Building	B
Hoist 54-1A, B; 54-2A, B	2,000	Diesel Generator Building	B

TABLE 2.2. (continued)

Handling System	Capacity (lbs)	Location	*Hazard Elimination Category
Hoist 54-1C, D; 54-2C, D	2,000	Diesel Generator Building	B
Hoist 55-1A, 55-2A	40,000	Diesel Generator Building	B
Hoist 55-1B, 55-2B	40,000	Diesel Generator Building	A
Hoist 56-1A, B; 56-2A, B	2,000	Diesel Generator Building	B
Hoist 57-1, 57-2	20,000	Diesel Generator Building	B
Hoist 63	10,000	Intermediate Building	B
Hoist 53	30,000	Control Complex	B
Hoist 65-1A, B; 65-2A, B	4,500	Diesel Generator Building	A
Hoist 65-1C, D; 65-2C, D	4,500	Diesel Generator Building	A
Hoist 68-1A to H; 68-2A to H	1,000	Control Complex	NA
Hoist 64-1A to D, 64-2A to D	30,000	Steam Tunnel	A, C
Hoist 71	3,000	Fuel Handling	B
Hoist 72	1,000	Fuel Handling	NA
Hoist 75-1, 75-2	4,000	Reactor Building	A, B, C
Hoist 76-1, 76-2	4,000	Reactor Building	A, B, C
Hoist 46-1, 46-2	8,000	Reactor Annulus	A, B
Hoist 47-1, 47-2	8,000	Reactor Annulus	B
Hoist 52	6,000	Control Complex	B

* Hazard Elimination Categories.

A System Redundancy and Separation.

B No safety related equipment or critical piping in the load coverage path.

C Loads lifted only when reactor is in cold shutdown.

TABLE 2.3. EMERGENCY SERVICE WATER PUMP HOUSE CRANE--PNPP UNITS 1 AND 2

Load	Approximate Weight (lbs)	Lift Equipment	Procedure	Remarks
ESW Pumps and Equipment	30,000 (maximum)	--	MAP.1301	Procedures are necessary to ensure that any lifts of Train 'A' equipment will not be made over Train 'B' equipment and lifts of Train 'B' equipment will not be made over Train 'A.'

a. No special lift device identified by applicant.

TABLE 2.4. FUEL HANDLING BUILDING CRANE--PNPP UNITS 1 AND 2

Load	Approximate Weight (lbs)	Lift Equipment	Procedure	Remarks
Fuel Shipping Cask	250,000 (maximum)	N/A	MAP.1301	Crane coverage area is not over the spent fuel pool or any area where spent fuel or safety related equipment is housed. Analysis has shown that a load drop at the west end of the crane coverage area will not degrade the spent pool leakage integrity. Procedures and design limitations prevent the cask from being dropped more than 30 feet so that the impact design of the cask is not exceeded.

TABLE 2.5. REACTOR BUILDING CRANE--PNPP UNITS 1 AND 2

	Load	Approximate Weight (lbs)	Lift Equipment	Procedure	Remarks
1.	Dry Well Head	130,000	--	MAP.1301	Analysis has shown that drop over reactor would not cause damage to the vessel and internals, including fuel.
2.	Vessel Head Piping Bundle	1,300	--	MAP.1301	Drop over reactor would not damage reactor and internals, including fuel.
3.	Thermal Insulaiton RPV Top Head	10,000	--	MAP.1301	Drop over vessel would not cause damage to fuel and vessel.
4.	PRV Head, O-rings and Head Strongback	236,000	Head Strongback	MAP.1301	Drop over vessel would not damage vessel and fuel.
5.	Dryer-Separation Strongback	8,000	N/A	MAP.1301	Drop over vessel would not damage vessel and fuel.
6.	Steam Dryer and Strongback	114,000	Dryer-Separator Strongback	MAP.1301	Drop over the reactor could possibly cause damage to the vessel and fuel. Further analysis is required.
7.	Separator and Strongback	76,000	Dryer-Separator Strongback	MAP.1301	Drop over the reactor would not cause damage to the vessel and fuel.
8.	Refueling Chute	36,000	--	Refueling Procedure	Refueling procedure will preclude load path over reactor.

a. No special lift device identified by applicant.

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:

- Guideline 1--Safe Load Paths
- Guideline 2--Load-Handling Procedures
- Guideline 3--Crane Operator Training
- Guideline 4--Special Lifting Devices
- Guideline 5--Lifting Devices (not specially designed)
- Guideline 6--Cranes (Inspection, Testing, and Maintenance)
- 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 Applicant's Statements

Reference [10] contains "information packets that were assembled for each elevation or section of the plant. The packets consist of general arrangement drawings that show:

(1) Location of equipment necessary for safe shutdown and continued decay heat removal with the respective emergency power division

(2) Coverage areas for the lifting devices

(3) Individual transport paths, both as elevation lifts and along the floor via dollies.

. . . Where necessary, piping composite drawings have been added to better show critical safety piping. The results of the heavy load movement study are listed in tables accompanying each packet . . . a separate table is presented for each lifting device."

In response [11], the applicant stated:

(1) Load paths will be clearly marked on the floor where the load is to be handled and appropriate procedures will be implemented. The load will be walked through by the lift supervisor only in areas where it is difficult to clearly mark the load path on the floor.

(2) No alternate load paths are presently defined in the Perry Equipment removal scheme; however, it is currently under evaluation. The plant operation review committee will designate individuals authorized to approve procedural variations, typically the maintenance or shift supervisors.

(3) Analysis and criteria used for hazard elimination, the PNPP Equipment Removal Scheme, and special Handling/ Safe Load Path procedures will be maintained on file and available for review.

B. EG&G Evaluation

EG&G finds CEICo's identification of the various load paths to be very detailed and well presented. Included drawings are very informative and most of the hazard elimination categories are self-explanatory and readily acceptable.

C. EG&G Conclusions and Recommendations

Perry Nuclear Power Plant, Units 1 and 2 comply with the criteria of NUREG-0612, Section 5.1.1(1), Safe Load Paths.

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's Statements

The applicant provided the following response in Reference [11].

"The load-handling procedures are being written and will be open for review on-site when they are complete. Attached is a draft copy of Control of Heavy Loads Procedure MAP-1301. Additional procedures on crane operating guidelines, and guidelines for rigging are provided for your information. Dollies will be used in the movement of heavy loads, but will not be pulled by cranes, i.e., cranes are not used as mechanical mules."

B. EG&G Evaluation

With the applicant preparing the necessary load-handling procedures, EG&G concludes that the criteria of Guideline 2 will be accomplished. Draft Procedure MAP-1301 specifically addresses those load movements requiring administrative procedure control as identified in the summary conclusion of the PNPP Control of Heavy Loads Study. The appplicant states (in MAP-1301) that the handling of Category A and B items will be in accordance with written-approved procedures and associated instructions or drawings. Items that are to be included in the procedures address identification of required equipment, inspections, and acceptance criteria required before movement of the load, the steps and proper sequence to be followed in handling the load, and special precautions. MAP-1301 also addresses safe load paths. The crane operating guidelines require performance of a daily prior-to-use inspection.

C. EG&G Conclusions and Recommendations

EG&G concludes that Perry Nuclear Power Plant, Units 1 and 2 are in full compliance with the criteria of NUREG-0612, Section 5.1.1(2), Load-Handling Procedures.

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 Applicant's Statements

An overhead Crane Operator Qualification guide (MAP-0201) has been written and a draft copy provided by the applicant in Reference [9]. This guide states that operators shall be trained to ANSI B30.2-1976, ASME/ANSI N45.2.15-1981, and ANSI B30.9-1971. The Qualifications guide contains reference to NUREG-0612 for operation of the Polar, Fuel Handlings, and ESW Cranes. The following guidelines from NUREG-0612 are listed in the qualifications guide: "Operator qualification will require familiarity with the PNPP Equipment Removal Scheme and Special handling safe load path procedures. Knowledge will be checked by interviews, written exam, and practical demonstration. Completion of these requirements will be documented on a qualification card which will be reformed in the operations training file."

B. EG&G Evaluation

EG&G has determined that the program proposed by CEICo is very commendable.

C. EG&G Conclusions and Recommendations

EG&G concludes that Perry Nuclear Power Plant, Units 1 and 2 are in compliance with the criteria of NUREG-0612, Section 5.1.1(3), Crane Operator Training.

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 Applicant's Statements

The applicant, in response [9], submitted a draft copy of MAP-1301, a procedure for the control of Heavy Loads. Section 6.1.3.1 states "Special Lifting devices used for the movement of Heavy Loads shall meet the requirements stated in NUREG-0612, Article 5.1.1 guideline 4 and ANSI N14.6-1978."

B. EG&G Evaluation

EG&G considers the contents of draft procedures provided as being commitments toward compliance; therefore, on the basis of the applicant's statement, EG&G concludes that CEICo intends to comply with the NUREG-0612 criteria.

C. EG&G Conclusions and Recommendations

EG&G concludes that Perry Nuclear Power Plant, Units 1 and 2 are in compliance with the criteria of NUREG-0612, guideline 4, Special Lift Devices.

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 Applicant's Statements

The applicant, in response [9], submitted a draft copy of MAP-1301, a procedure for the control of Heavy Loads. Section 6.1.3.2 states "Lifting devices that are not specially designed, used for the movements of 'Heavy Loads,' shall meet the requirement stated in NUREG-0612, Article 5.1.1, guideline 5 and ANSI B30.9-1971." CEICo further stated "Each sling will be properly identified as to its lifting capacity, applicability to specific load-handling operations, and if appropriate, restriction of its use to specific cranes."

B. EG&G Evaluation

EG&G considers the contents of draft procedures provided as being commitments toward compliance; therefore, on the basis of the applicant's statement, EG&G concludes that CEICo intends to comply with the NUREG-0612 criteria.

C. EG&G Conclusions and Recommendations

EG&G concludes that Perry Nuclear Power Plant, Units 1 and 2 are in compliance with the criteria of NUREG-0612, guideline 5, Lift Devices Not Specially Designed.

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's Statements

"The crane inspection, testing, and maintenance program is written in detail in the Perry Maintenance Section procedures. For example, the Reactor Polar Crane monthly Preventative Maintenance, Reactor Polar Crane Quarterly and semiannual Preventive Maintenance, and Reactor Polar Crane Yearly Preventative Maintenance procedure (see attached) are written in detail and Reference ANSI B30.2-1976. CEI will meet the specifications of ANSI B30.2-1976" [9].

B. EG&G Evaluation

The draft copy of the PNPP Preventative Maintenance Instructions appear to be very complete and well presented. EG&G considers the content of draft procedures provided as being commitment toward compliance; therefore, on the basis of the applicant's statement, EG&G concludes that CEICo intends to comply with the NUREG-0612 criteria.

C. EG&G Conclusions and Recommendations

EG&G concludes that Perry Nuclear Power Plant, Units 1 and 2 are in compliance with the criteria of NUREG-0612, guideline 6, Cranes (Inspection, Testing, and Maintenance).

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 Applicant's Statements

"All Cranes identified in this report that handle loads in safety-related buildings are designed to CMAA Specification 70 and ANSI B30.2-1976 [10]." The applicant provided additional information in Reference [9] that includes crane manufacturer, type, serial number, load capacity, and purchase data.

B. EG&G Evaluation

On the basis of the applicant's statement and the additional information provided, EG&G feels that the criteria of guideline 7 will be satisfied.

C. EG&G Conclusions and Recommendations

EG&G concludes that Perry Nuclear Power Plant, Units 1 and 2 are in compliance with the criteria of NUREG-0612, guideline 7, Crane Design.

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:

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

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

EG&G recommends that because CEICo Perry Nuclear Power Plant, Units 1 and 2 are not yet operational, and will not be operational for quite some time, it is more appropriate that the time be spent completing

those commitments toward compliance with the guidelines in NUREG-0612, Article 5.1 rather than addressing interim measures. Proper compliance with these guidelines negates the necessity of interim protection measures.

CEICo stated that their present position is to be in full compliance with the guidelines of NUREG-0612 prior to fuel load [9].

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 complete (see Section 2.2.1). The Applicant also fulfilled the requirements of NUREG-0612 concerning exclusion of various Overhead Handling Systems.

3.2 Guideline Recommendations

Compliance with the seven NRC guidelines for heavy load-handling (Section 2.3) are satisfied at Perry Nuclear Power Plant, Units 1 and 2. This conclusion is represented in tabular form as Table 3.1.

TABLE 3.1. COMPLIANCE MATRIX PERRY NUCLEAR POWER PLANTS, UNITS 1 AND 2

Equipment Designation	Heavy	Capacity (lb)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lift Devices	Guideline 5 Slings	Guideline 6 Crane-Test and Inspection	Guideline 7 Crane Design
Emergency Service Water Pump House Crane	C	30,000	C	C	C	C	C	C	C
Reactor Building Crane	C	150,000	C	C	C	C	C	C	C
Fuel-Handling Building Crane	C	250,000	C	C	C	C	C	C	C

C=Applicant action complies with NUREG-0612 guideline.

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 CEICo. Subject: NRC Request for Additional Information on Control of Heavy Loads Near Spent Fuel, NRC, 22 December 1980.

4. Letter to NRC, Subject: Control of Heavy Load Study from D. R. Davidson, Vice President The Cleveland Electric Illuminating Company to D. G. Eisenhut, Director, USNRC, 19 June 1981.

5. ANSI B30.2-1976, "Overhead and Gantry Cranes".

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7. ANSI B30.9-1971, "Slings".

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9. Letter to NRC, Subject: Response to Draft Technical Evaluation Report. Control of Heavy Loads, from D. R. Davidson, The Cleveland Electric Illuminating Company to A. Schwencer, USNRC, 15 September 1982.

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U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

1. REPORT NUMBER (Assigned by DDC)
EGG-HS-6264

4. TITLE AND SUBTITLE
Control of Heavy Loads at Nuclear Power Plants
The Cleveland Electric Illuminating Company
Perry Nuclear Power Plant, Units 1 and 2 (Phase 1)

2. (Leave blank)

3. RECIPIENT'S ACCESSION NO.

7. AUTHOR(S)
J. P. Sekot, T. H. Stickley

5. DATE REPORT COMPLETED
MONTH: April YEAR: 1983

9. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
EG&G Idaho, Inc.
Idaho Falls, ID 83415

DATE REPORT ISSUED
MONTH: June YEAR: 1983

6. (Leave blank)

8. (Leave blank)

12. SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
Division of Systems Integration
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

10. PROJECT TASK/WORK UNIT NO.

11. FIN NO.
A6457

13. TYPE OF REPORT

PERIOD COVERED (Inclusive dates)

15. SUPPLEMENTARY NOTES

14. (Leave blank)

16. ABSTRACT (200 words or less)

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 final report is a result of EG&G's review of the responses submitted for the Perry Nuclear Power Plant, Units 1 and 2 to the requirements of Section 5.1.1 of NUREG-0612 (Phase I). Sections 5.1.2, 5.1.4, 5.1.5, and 5.1.6 (Phase II) will be covered in a separate report.

17. KEY WORDS AND DOCUMENT ANALYSIS

17a. DESCRIPTORS

17b. IDENTIFIERS/OPEN-ENDED TERMS

18. AVAILABILITY STATEMENT
Make available only as specifically approved by program office.

19. SECURITY CLASS (This report)
Unclassified

20. SECURITY CLASS (This page)
Unclassified

21. NO. OF PAGES

22. PRICE

NRC FORM 335 (11 81)