

CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS
PERRY NUCLEAR POWER PLANT UNITS 1 AND 2
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

Docket No. 50-440 & 50-441

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ABSTRACT

The Nuclear Regulatory Commission has requested that all nuclear plants either operating or under construction submit a response of compliance 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 The Cleveland Electric Illuminating Company, Perry Nuclear Power Plant Units 1 and 2.

EXECUTIVE SUMMARY

Perry Nuclear Power Plant Units 1 and 2 of the Cleveland Electric Illuminating Company do not totally comply with the guidelines of NUREG-0612. In general, compliance is insufficient in the following areas:

- o Several programs needed to address issues raised by the guidelines or demonstrate compliance are only now being written, or will be written and/or implemented in the future.
- o Insufficient information has been provided for proper assessment of compliance with various aspects of the several guidelines.
- o Several guidelines were dealt with in a very cursory manner and require a more detailed analysis by the licensee.

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
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY,
PERRY NUCLEAR POWER PLANT UNITS 1 AND 2

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 (PNPP) Units 1 and 2. The review was performed to assess compliance with 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 certain aspects, particularly load movement and control, of nuclear power plant licensing 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, did 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, based on an accepted approach or protection philosophy, designed to achieve a two-phase objective. 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 the design of all load handling systems at nuclear power plants is appropriate and adequate for the critical tasks in which they are employed and the systems are operated in such a manner that the probability of failure is minimal. The second portion of the staff's objective will be achieved through guidelines identified in NUREG-0612, Articles 5.1.2 through 5.1.5.

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

In December 22, 1980, the NRC issued a letter [3] to The Cleveland Electric Illuminating Company, the Licensee for The Perry Nuclear Power Plant Units 1 and 2, requesting that the Licensee review provisions for handling and control of heavy loads at Perry Nuclear Power Plant 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 19 June 1981, The Cleveland Electric Illuminating Company provided its initial response [4] to this request.

2. EVALUATION AND RECOMMENDATIONS

2.1 Overview

The following sections summarize The Cleveland Electric Illuminating Company (CEICo) review of heavy load handling at Perry Nuclear Power Plant Units 1 and 2 and include EG&G's evaluation, conclusions, and recommendations to the licensee for bringing the facilities into more complete compliance with the intent of NUREG-0612. The CEICo review of the facilities does not indicate substantial difference between the two units. While EG&G is willing to agree with CEICo assumption of similar design, it is noted that the two plants are not duplicates or mirror images of one another. Therefore, it is obvious that on occasion differences do exist and must be addressed separately. The licensee has indicated the minimum weight of a heavy load for this facility (as defined in NUREG-0612, Article 1.2) as 1048 lbs. EG&G wishes to commend CEICo for their subjection of all hoists to the more rigorous regulations as that of cranes.

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 hoists and monorails used in the plants are all listed and the crane operations for each are listed. Potential hazards are listed for each load handling operation. The method of evaluating each hazard elimination is also provided.

B. EG&G Evaluation

EG&G has determined that CEICo's response to crane identification is well documented. The tables provided for the various lifting devices and crane handling operations are very complete. However, the drawing indicates that a notable amount of heavy load handling is accomplished by dollies and not by cranes. CEICo should state if cranes are employed to lift the loads onto or off of the dollies, and if the cranes are employed as mechanical mules to move the loaded dollies.

In addition, EG&G requests that the maximum load capacity of each crane be stated.

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.

C. EG&G Conclusion and Recommendations

EG&G concludes that CEICo has identified all cranes which are covered by NUREG-0612.

EG&G recommends that CEICo supply as further information:

- o Load capacity of each crane addressed in the response.
- o The use of or interaction of overhead cranes with the movement of heavy loads by dollies.

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 concern 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 permit handling 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 could 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]

"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

'Information packets have been 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.

To facilitate the use of the arrangement drawings, a key correlating equipment tag number with the equipment name has been included...'

'... A separate table is presented for each lifting device; the table includes the impact area, the load or load lift by the device, safety-related equipment that could be damaged by a load drop, floor elevation, and the category for hazard elimination. The categories for hazard elimination are as follows:

A. ...

B. ...'

(CEICo Responses Pages 1 and 3).

B. EG&G Evaluation

EG&G finds CEICo 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.

However, NUREG-0612 requires '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.' In the response by CEICo, no mention is made of delineating the safe load handling paths.

Also, several of the hazard elimination categories required CEICo to perform some sort of analysis or judgement, the basis of which was not included in the licensee report. For example:

- D. 'Likelihood of handling system failure for this load is extremely small.
- E. Analysis demonstrates that crane failure and load drop will not damage safety-related equipment.'
(CEICo reference page 3)

EG&G has no criticism of CEICo evaluation of each load handling operation. However, EG&G has not been given the information to properly assess the criteria used by CEICo for hazard elimination. Therefore, EG&G suggests that each hazard elimination evaluation be maintained on file and be available for review.

EG&G also notes that CEICo does not mention or address the subject of alternative load paths.

C. EG&G Conclusions and Recommendations

EG&G concludes that CEICo is in partial compliance with the intent of NUREG-0612 Section 5.1.1(1).

As part of the minimal compliance requirements, EG&G recommends:

- (i) a suitable technique be devised by which the safe load handling paths can be delineated.
- (ii) the analysis and criteria used for hazard elimination be kept available for review.
- (iii) the subject of alternative load paths be addressed.

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 Licensee Statements

'The inspection and preventive maintenance instructions for all of the overhead cranes are being written...'

'An Overhead Crane Operation qualification guide is being written... The following general guidelines from NUREG-0612 are listed in the qualification guide:

- a. ...
- b. Procedures for Handling of Heavy Loads.'

'Operator qualification will require familiarity with the PNPP Equipment Removal Scheme and special handling/safe load paths procedures...'

'To ensure that safe load paths are followed, crane operators and maintenance personnel involved in supervising load handling will be familiar with all requirements prior to lifts. Information will be presented through in-site training and will be referenced in maintenance instructions and procedures.'

(CEICo Response pages 4 and 5)

B. EG&G Evaluation

EG&G has determined that CEICo did not address the subject of load handling procedures directly. However, CEICo did allude to the subject at several points.

The heavy load handling procedures referred to by CEICo are apparently not currently written but 'are being written.'

EG&G believes the proposed Load Handling Procedures Program which is being initiated by CEICo is a good program. However, the documentation has to be written, submitted for review, and implemented before the guideline can be completely satisfied.

EG&G was not provided with a copy of 'PNPP Equipment Removal Scheme and Special Handling/Safe Load Path Procedures.'

EG&G suggest that the procedure be submitted for review.

EG&G finds several CEICo statements on the prepared load handling policy by CEICo to be very commendable especially: 'Information will be presented through on-site training...'

C. EG&G Conclusion and Recommendations

EG&G concludes that CEICo is in minimal compliance with the intent of NUREG-0612 Section 5.1.1(2).

However, the ~~proposed~~ program should be written up and placed on file for review and audit by the NRC before NUREG-0612 guidelines can be satisfied.

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 Licensee Statements

'An Overhead Crane Operator qualifications guide is being written. This guide will follow the requirements of ANSI B30.2-1976 for qualifications of operators and will contain reference to NUREG-0612 for operation of the Polar, Fuel Handling and ESW cranes. The following general guidelines from NUREG-0612 are listed in the qualification guides:

'Operator qualification will require familiarity with the PNPP Equipment Removal Scheme and special handling safe load path procedures. Knowledge will be checked by interview, written exam and a practical demonstration. Completion of these requirements will be documented on a qualification card which will be retained in the operators' training file.'

(CEICo response page, 4 and 5)

B. EG&G Evaluation

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

C. EG&G Conclusion and Recommendations

EG&G concludes that CEICo is in compliance with the intent of NUREG-0612 Section 5.1.1(3).

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 Licensee Statements

'An Overhead Crane Operator qualification guide is being written... The following general guidelines from NUREG-0612 are listed in the qualification guides:

a. ...

b. ...

c. ...

d. ANSI N14.6-1978 for Special Lifting Devices.'

(CEICo Response page 4)

B. EG&G Evaluation

EG&G has determined that CEICo does not properly address the NUREG-0612 guideline concerns with special lifting devices.

EG&G particularly notes that NUREG-0612 requires that the stress design factor now be based on the combined maximum static and dynamic loads. CEICo did not address this subject analysis in their response.

EG&G also wishes to point out that the NRC believes that special lifting devices and their associated problems are sufficiently important that CEIco should devote a special written section to their compliance with the guidelines concerning these devices.

EG&G also wishes to mention that the proposed write-up should address the change to 10 CFR Part 100. Section 2.1 of NUREG-0612 specifies the allowable offsite radioactive release applicable to heavy loads as 25% of the guideline exposures outlined in 10 CFR Part 100.

C. EG&G Conclusion and Recommendations

EG&G concludes that CEIco is not in compliance with the intent of NUREG-0612 Section 5.1.1(4).

As part of the nominal compliance^N requirements, EG&G recommends that all the information on special lifting devices be written into a single section, and it be resubmitted for review and approved.

Part of the write-up should address the maximum static and dynamic load stresses of each special load devices, their summed values, and the compared result with the calculated and tested load strength of the heavy loading system using that special lifting device.

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 Licensee Statements

'Lifting devices and loads that have the potential to cause fuel damage, a criticality accident or loss of safe shutdown capability are separately identified in the summary portion of this report.'

'An Overhead Crane Operator qualification guide is being written... The following general guidelines from NUREG-0612 are listed in the qualification guides: -

- a. ...
- b. ...
- c. ...
- d. ...
- e. ANSI B30.9 for Slings and Other Lifting Devices.
- f.'

(CEICo Response page 4)

B. EG&G Evaluation

EG&G has determined that CEICo does not properly address the NUREG-0612 guideline concerned with lifting devices.

EG&G particularly notes that NUREG-0612 requires that the stress design factor now be based on the combined maximum static and dynamic loads. CEICo did not address this subject analysis in their response.

EG&G also is concerned with the 'summary portion of this report' (CEICo Response Page 6). In Section 1.6, 'The movement... must be controlled by administrative procedures.' This procedure has not been outlined, referenced or explained and therefore the procedure cannot

be reviewed and analyzed. Similarly, in Section 2.a & b, 'Analysis is yet to be completed...' therefore the analysis can not be reviewed.

As with the special lifting devices in the previous section, NRC believes lifting devices and their associated problems are sufficiently important that CEICo should devote a special written section to their compliance with guidelines concerning these devices.

EG&G also believes that each sling should be properly identified as to its lifting capacity, applicability to specific load handling operations, and, if appropriate, restriction of its use to specific cranes they are.

C. EG&G Conclusion and Recommendations

EG&G concludes that CEICo is not in compliance with the intent of NUREG-0612 Section 5.1.1(5).

As part of the nominal compliance requirements, EG&G recommends that all the information on lifting devices be written into a single section and it be resubmitted for review and approval of the NRC. This write-up should include both the maximum static and dynamic load stress of each loading device compared with the calculated and tested load strength. In addition, any load limitation, specific crane usage, etc., should be properly assessed for each sling and each sling so identified.

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

'The inspection and preventative maintenance instructions for all of the overhead cranes are being written under the guidelines of ANSI B30.2-1976 and the vendor service manuals. For those cases where requirements differ, the more stringent is being applied.'

'An Overhead Crane Operator qualification guide is being written... The following general guidelines from NUREG-0612 are listed in the qualification guides:

- a.
- b.
- c.
- d.
- e.
- f. Crane Inspection and Testing in accordance with ANSI B30.2-1976.'

(CEICo response page 4)

B. EG&G Evaluation

EG&G wishes to remind CEICo that specific plant operation situations may require alterations to ANSI B30.2-1976. For example, NUREG-0612 Section 5.1.1(6) points out that periodic inspections may not always be possible. Therefore, alternate proposals are required. However, all changes and new proposals must be submitted for review and approval. Rewrite must be accepted before compliance can be granted.

C. EG&G Conclusion and Recommendations

EG&G concludes that CEICo is in partial compliance with the intent of NUREG-0612 Section 5.1.1(6).

As part of the nominal compliance requirements, EG&G recommends that the proposed crane inspection, testing, and maintenance program be written and submitted for approval before compliance can be granted. Any variances from the existing, referred to, guidelines must be specifically addressed.

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 Licensee 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.'

(CEICo response page 5)

B. EG&G Evaluation

EG&G believes the statement above to be valid. However, there was insufficient information provided by CEICo for proper assessment. EG&G believes that manufacturer name, crane model, and purchase data would provide the minimum information necessary to judge the crane design.

C. EG&G Conclusion and Recommendations

EG&G concludes that CEICo has provided insufficient information by which the ~~with the~~ intent of NUREG-0612 Section 5.1.1(7) can be judged.

EG&G recommends that additional information on each crane be provided.

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.

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 bringing the plant into compliance with the guidelines in NUREG-0612 Article 5.1 than the time be spent addressing interim measures. Proper compliance with these guidelines negates the necessity of Interim Protection Measures.

CEICo should either address the section on Interim Protection Measures or give a statement of assurance that the plants will be brought into compliance before, say plant fueling, without the need of the Interim Protection 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 more information be provided; for example, load capacity of each crane, and the interaction of Overhead Crane Operations with dolly movement of heavy loads. (Also see Guideline 7 below.)

3.2 Guideline Recommendations

Compliance with the seven NRC guidelines for heavy load handling (Section 2.3) is partially satisfied at Perry Nuclear Power Plant (PNPP) Units 1 and 2. Conclusions are ~~as~~ represented in tabular form in Table 3.1. Guideline recommendations are meant to serve as a partial list of deficiencies which CEI Co must satisfy. The changes, the modifications, and the proposed write-ups and programs are to be submitted and approved by the NRC and are to be maintained on file for subsequent audit before PNPP Units 1 and 2 can be considered to be in compliance with NUREG-0612. Complete compliance must be obtained on all sections of NUREG-0612 before the plant can begin fueling. Several of the principal recommendations which will aid in bringing the plant into nominal compliance with the intent of these guidelines are provided as follows:

<u>Guideline</u>	<u>Recommendation</u>
i. (Section 2.3.1) <u>Safe Load Paths</u>	(a) Devise a method of delineating safe load handling paths
	(b) Analyze and justify alternate load paths

<u>Guideline</u>	<u>Recommendation</u>
	(c) Maintain analysis and criteria used for hazard elimination available for review.
2. (Section 2.3.2) <u>Load Handling Procedures</u>	Procedures should be written and submitted for review as soon as possible.
3. (Section 2.3.3) <u>Crane Operator Qualifications</u>	No recommendation.
4. (Section 2.3.4) <u>Special Lifting Devices</u>	Sufficient attention has not been given to special lifting devices; for example ^{there} their was no mention of dynamic loading considerations.
5. (Section 2.3.5) <u>Lifting Devices</u>	Sufficient attention has not been given to lifting devices, for example ^{there} their was no mention of dynamic loading considerations.
6. (Section 2.3.6) <u>Cranes</u>	Crane inspection, testing, and maintenance program should be written with special attention to the specification of ANSI B30.2-1976 and the limitations placed on the program by the plant operating conditions.
7. (Section 2.3.7) <u>Crane Design</u>	Addition information on each crane is required.

3.3 Interim Measures

(Section 2.4)

A policy statement should be made concerning CEICo's attitude towards the subject.

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 CEI Co. 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 ~~by~~
From Dalwyn R. Davidson, Vice-President, The City and Electric
Illuminating Company to Darrell G. Eisenhunt, ~~Director~~, U.S.
Nuclear Regulatory Commission, 19 June 1981.
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. COMPLIANCE STATUS OF CLEVELAND ELECTRIC ILLUMINATING COMPANY, PERRY NUCLEAR POWER PLANT UNITS 1 AND 2

Equipment Designation	Heavy Loads	Weight or Capacity (lbs)	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
(1) Hoist 33-1 and 33-2	-- I	I 16,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(2) Hoist 34-1 and 34-2 III-AB-2 III-AB-3 2II-AB-2 2II-AB-3	-- Hatch Covers	I 10,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(3) Hoist 35-1 and 35-2 III-AB-7 2II-AB-7	-- Hatch Removal & High Pressure Core Spray	I 28,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(4) Hoist 42-A, IB	-- CRD Maintenance Equipment	I I	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(5) Hoist 43	-- CRD and Cask Removal	I 6,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(6) Hoist 44	-- Reactor Recirculation Pump Removal	I 60,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --

TABLE 3.1. (continued)

Equipment Designation	Heavy Loads	Weight or Capacity (lbs)	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
(7) Hoist 45-1 45-2	-- Reactor Recirculation Pump Motor	I 66,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(8) Hoist 49-1 49-2	-- Drywell Personnel Lock Equipment	I 6,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(9) Hoist 50-1 50-2	-- CRD Alternate Removal Through Personnel Hatch	I I	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(10) Hoist 51-1 52-2	-- CRD and Cask Removal to Drywell	I 6,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(11) Hoist 58	-- Nuclear Closed Cooling Pump	I 6,385	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(12) Hoist 59	-- Nuclear Closed Cooling Pump	I 6,385	-- I	-- P	-- C	-- NC	-- NC	P --	I --

TABLE 3.1. (continued)

Equipment Designation	Heavy Loads	Weight or Capacity (lbs)	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
(13) Hoist 60	-- Nuclear Closed Cooling Pump	1 6,385	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(14) Fuel Handling Machine Auxiliary Hook	-- Fuel Pool Gates	1 1,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(15) Hoist 36	-- I	1 12,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(16) Hoist 37-1 37-2	-- Hatch Removal	1 28,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(17) Hoist 38-1 38-2	-- Low Pressure Core Spray Pump	1 14,500	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(18) Hoist 39-1 39-2	-- RHR Pump A	1 16,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(19) Hoist 40-1 40-2	-- RHR Pump B	1 16,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --

TABLE 3.1. (continued)

Equipment Designation	Heavy Loads	Weight or Capacity (lbs)	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
(20) Hoist 41-1 41-2	-- Hatch Cover Removal for Fuel Transfer Tube	I I	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(21) Hoist 54-1A 54-1B 54-2A 54-2B	-- 7000 kW Diesel Generator	I 1,500	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(22) Hoist 54-1C 54-1D 54-2C 54-2D	-- 7000 kW Diesel Generator	I 1,500	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(23) Hoist 55-1A 55-2A	-- 7000 kW Diesel Generator Rotor	I 39,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(24) Hoist 55-1B 55-2B	-- 7000 kW Diesel Generator Rotor	I 39,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(25) Hoist 56-1A 56-1B 56-2A 56-2B	-- 2600 kW Diesel Generator	I 2,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --

TABLE 3.1. (cont Inued)

Equipment Designation	Heavy Loads	Height or Capacity (lbs)	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
(26) Hoist 57-1 57-2	-- 2600 kW Diesel Generator Rotor	I 19,500	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(27) Hoist 63	-- Fuel Pool Filter Demineralizer Hatch Removal	I 10,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(28) Hoist 53	-- Hatch & Electrical Equipment Removal	I 23,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(29) Hoist 65-1A 65-1B 65-2A 65-2B	-- D.G. Air Intake Filter Inlet Pipe	I 4,500	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(30) Hoist 65-1C 65-1D 65-2C 65-2D	-- D.G. Air Intake Filter Outlet Pipe	I 4,500	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(31) Hoist 68-1A to II 68-2A to II	-- Battery Maintenance	I 1,000	-- I	-- P	-- C	-- NI	-- NC	P --	I --

TABLE 3.1. (cont Inued)

Equipment Designation	Heavy Loads	Weight or Capacity (lbs)	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
(32) Hoist 64-1A to D 64-2A to D	-- Main Stream Isolation Valves	I 30,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(33) Hoist 21	-- Jib Crane	I 3,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(34) Hoist 72	-- Fuel Prep Machine	I 1,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(35) Hoist 25-1 25-2	-- M/SV and Relief Valve	I 3,500	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(36) Hoist 75-1 75-2	-- M/SV and Relief Valve	I 3,500	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(37) Hoist 52	-- Hatch and Ventilation Equipment	I 6,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --
(38) Fuel Handling Building Crane	-- Fuel Shipping Cask	I 250,000	-- I	-- P	-- C	-- NC	-- NC	P --	I --

TABLE 3.1. (continued)

Equipment Designation	Heavy Loads	Weight or Capacity (lbs)	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
(39)								P	I
Reactor	--	I	--	--	--	--	--	--	--
Building	--	130,000	I	P	C	NC	NC	--	--
Crane	Drywell Head	1,300	I	P	C	NC	NC	--	--
	Vessel Head	10,000	I	P	C	NC	NC	--	--
	Thermal Installation	236,000	I	P	C	NC	NC	--	--
	RPV Head & O-Ring	8,000	I	P	C	NC	NC	--	--
	Dryer Separator								
	Strong Back								
	Steam Dryer & Strong Back	114,600	I	P	C	NC	NC	--	--
	Separator & Strong Back	76,000	I	P	C	NC	NC	--	--
	Refueling Chute	36,000	I	P	C	NC	NC	--	--
	Refueling Gates	1,700	I	P	C	NC	NC	--	--

C = Licensee action complies with NUREG-0612 Guideline.

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

P = Licensee has proposed a program which when completed will be in compliance with NUREG-0612 guidelines.

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

I = Insufficient information provided by the Licensee/or the proposed program is only in partial compliance with NUREG-0612 guideline.