

CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS
ST. LUCIE PLANT UNIT 2,
FLORIDA POWER & LIGHT CO.

Docket No. 50-389

Author
C. R. Shaber

Principal Technical Investigator
T. H. Stickley
EG&G Idaho, Inc.

May 1982

8208040109 820720
PDR ADCK 05000389
A PDR

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 St. Lucie Plant, Unit 2.

EXECUTIVE SUMMARY

St. Lucie Plant, Unit 2 does not totally comply with the guidelines of NUREG-0612. In general, compliance is insufficient in the following areas:

- o of information supplied being adequate to evaluate effectively that action taken meets the NUREG requirements
- o physical marking of safe load paths in the plant area
- o up grading of plant unit 1 procedures for application at plant unit 2
- o operator qualification
- o identification and quality of special lifting devices
- o regular lifting devices
- o crane and hoist inspection and testing.

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

CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
	ABSTRACT	ii
	EXECUTIVE SUMMARY	ii
1.	INTRODUCTION	1
1.1	Purpose of Review	1
1.2	Generic Background	1
1.3	Plant-Specific Background	3
2.	EVALUATION AND RECOMMENDATIONS	4
2.1	Overview	4
2.2	Heavy Load Overhead Handling Systems	4
2.3	General Guidelines	6
2.4	Interim Protection Measures	17
3.	CONCLUDING SUMMARY	21
3.1	Applicable Load Handling Systems	21
3.2	Guideline Recommendations	21
3.3	Interim Protection	24
4.	REFERENCES	25

TECHNICAL EVALUATION REPORT
FOR
ST. LUCIE PLANT, UNIT 2

1. INTRODUCTION

1.1 Purpose of Review

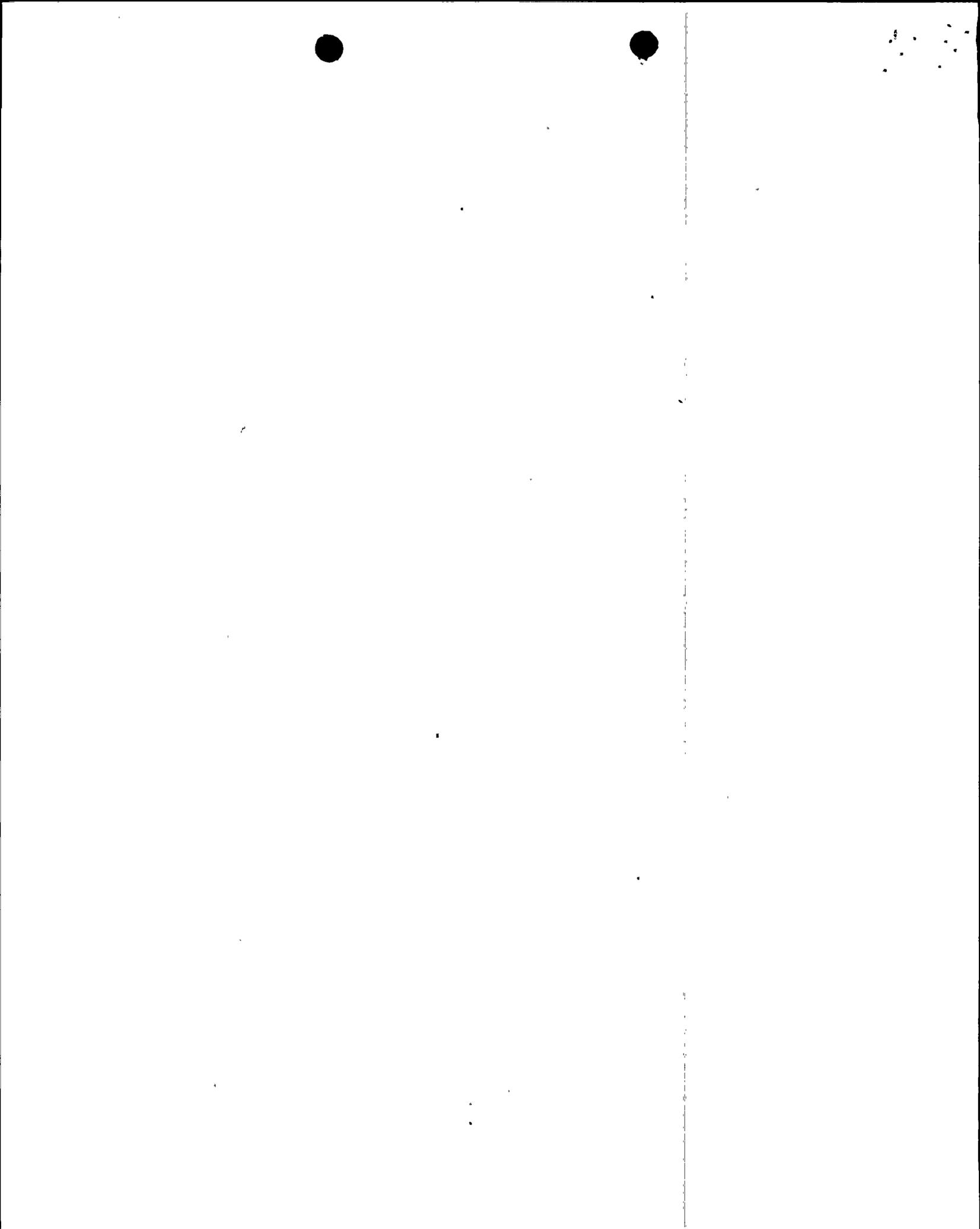
This technical evaluation report documents the EG&G Idaho Inc. review of general load handling policy and procedures at Florida Power and Light Co., St. Lucie Plant, Unit 2. This evaluation was performed with the objective of assessing conformance to the general load handling guidelines of NUREG-0612, "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 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

In December 22, 1980, the NRC issued a letter [3] to Florida Power & Light Co., the Licensee for St. Lucie Plant, Unit 2 requesting that the Licensee review provisions for handling and control of heavy loads at St. Lucie Plant Unit 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 August 6, 1981, Florida Power and Light Co. provided the initial response [4] to this request.

2. EVALUATION AND RECOMMENDATIONS

2.1 Overview

The following sections summarize Florida Power & Light Company's review of heavy load handling at St. Lucie Plant, Unit 2 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. Florida Power & Light Co. review of the facilities does not differentiate between the two units so it is assumed that both units are of identical design. The licensee has indicated the weight of a heavy load for this facility (as defined in NUREG-0612, Article 1.2) as approximately 1380 pounds.

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 identified the cranes and hoists in a Table and coded as Group I those which handle heavy loads in the vicinity of irradiated fuel or safe shutdown equipment.

The Licensee has also identified twelve cranes by a Group II classification that has been excluded from satisfying the criteria of the general guidelines of NUREG-0612.

B. EG&G Evaluation

The Licensee did not state what type of criteria they used in their inspection but did establish what they consider as sufficient physical separation between any load impact point and any safety related equipment or any irradiated fuel. The lack of specific criteria or other information such as drawings showing the relationship between crane coverage and location of safety equipment prevents a detailed evaluation of the Licensee's statements.

C. EG&G Conclusions and Recommendations

Based on the information provided, EG&G concludes that the Licensee has included all applicable hoists and cranes in their Group I list of handling systems which must comply with the requirements of the general guidelines of NUREG-0612.

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 basis statement given is, "Safe load paths have been defined as requested and are shown on six sketches provided as Appendix B." Seven Group I heavy load handling systems are identified and removed from evaluation. Three because the loads are less than a defined heavy load; two because loads must follow the one path of a monorail; two groups because they involve monorails, 3 for charging pumps, and 8 for diesel engine overhaul where loads cannot involve other safety related equipment.

An administrative procedure for unit No. 1 plant is to be revised to include unit No. 2 as it becomes operational. The procedure is reported to describe measures taken to ensure that heavy load operations follow safe load paths. Facility Review Group approval is required for deviation.

B. EG&G Evaluation

The actions indicated are good, but fail to provide information that can be evaluated to determine the extent of compliance to the Safe Load Path guideline 1 of NUREG quoted above.

C. EG&G Conclusions and Recommendations

(1) The actions taken on defining paths, their marking on drawings, and plans for extending administrative procedure controls indicate progress, but is less than Guideline 1 requires.

(2) Records should be available for any subsequent audit, and should include data verifying that:

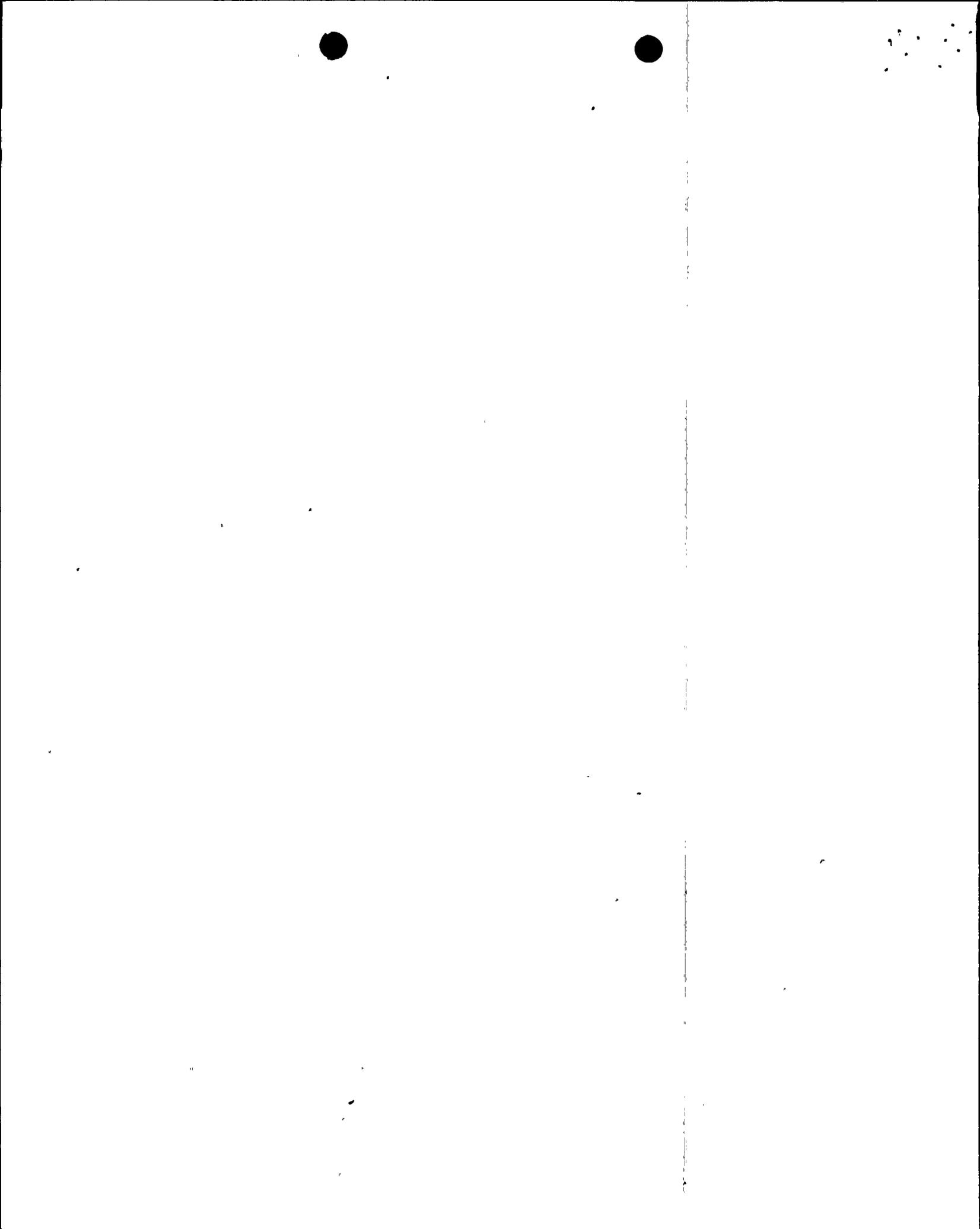
- o heavy loads paths follow structural floor members, beams etc. and the capability of potential drop areas to withstand the impact load of a heavy load drop
- o physical markings of load path areas will be applied in the plant when making a special lift
- o adaptation of the administrative procedure for Unit No. 1 to Unit No. 2 is complete and assures that the deviation approval system involves written change and approvals.

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

Section 2.1.3 (c) of Enclosure 3 of the NRC generic letter requests that heavy loads listed in Table 3.1-1 of NUREG 0612 be tabulated along with the load weight, designated lifting device and special handling procedure. These are significant heavy loads which are periodically



handled in the vicinity of irradiated fuel in the reactor core or spent fuel pool.

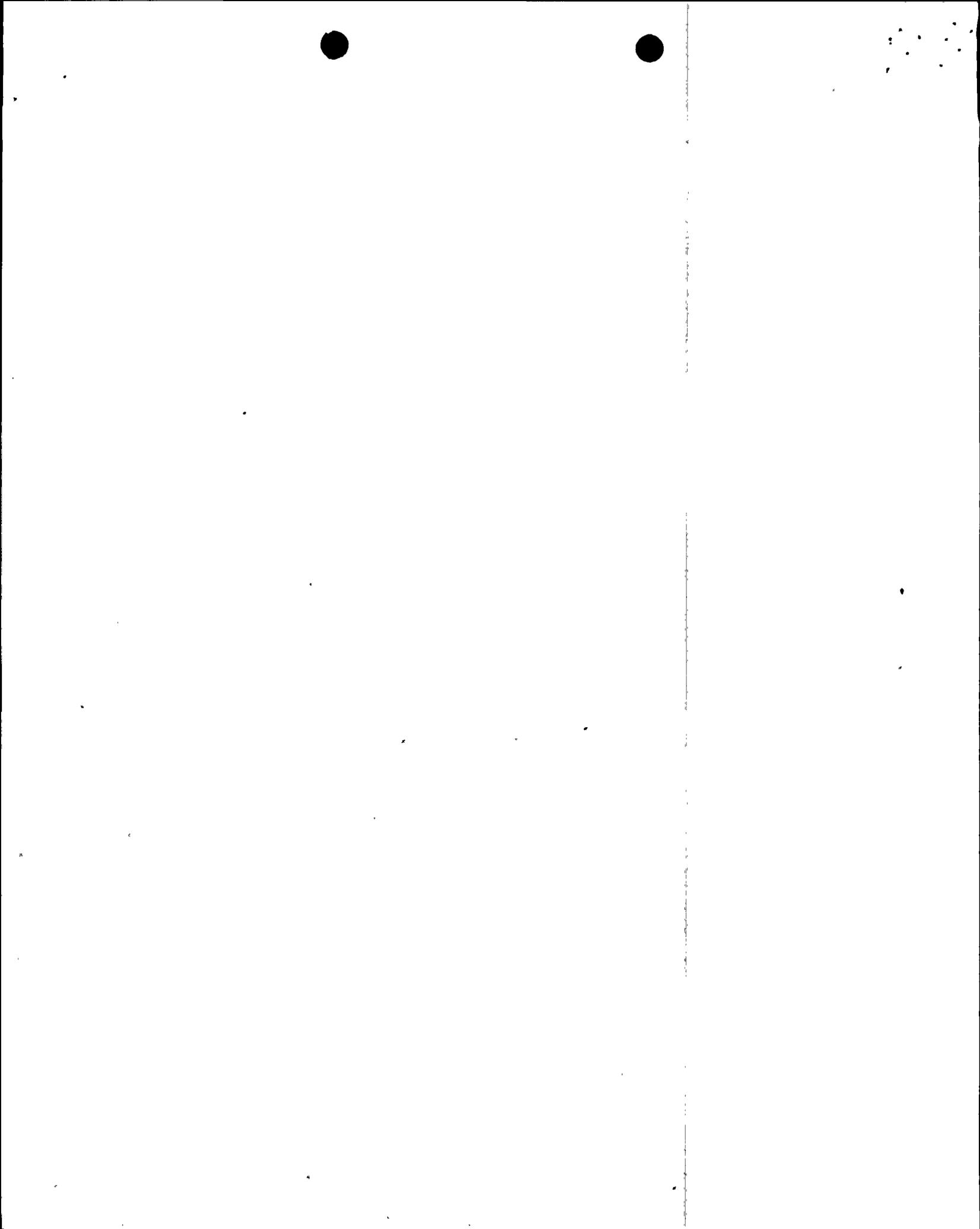
Table 2 in Appendix A of the St. Lucie report provides this tabulation and lists the special procedures developed for Unit No. 1 which follow the guidelines of NUREG 0612 Section 5.1.1 (2) for these loads. Special procedures for the handling of the refueling canal bulkhead pressurizer missile shield and In-Service-Inspection tool are being developed for Unit No. 1. All of these procedures will be revised to include Unit No. 2 when that plant becomes operational. A special procedure for the handling of the cask storage pool bulkhead will be developed for Unit No. 2 and implemented when required. All of these above mentioned procedures will be available at the plant for review.

B. EG&G Evaluation

The licensee response includes a Table 2 which lists thirteen heavy loads and the status of procedures for Plant Unit 1. Nine loads have procedures developed, three are being prepared and one is to be prepared. No information is given on; inspection and acceptance criteria before moving a load, the sequential steps, or special precautions. It should be noted that this action all relates to Plant Unit No. 1 with plans to incorporate, by revision, Plant Unit 2, when the plant becomes operational.

C. EG&G Conclusions and Recommendations

(1) The requirement seems to be identified and the developmental work is progressing for Plant Unit 1; with plans for them to be readily adaptable to Plant Unit 2.



(2) The licensee should be prepared to show in the event of an audit that all procedures for heavy load handling have been written and approved for handling in Plant Unit 2. Also, the procedures in addition to defining safe paths, must:

- o identify equipment
- o provide inspection and acceptance criteria before moving a load
- o include steps and proper sequence
- o include any special precaution necessary.

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

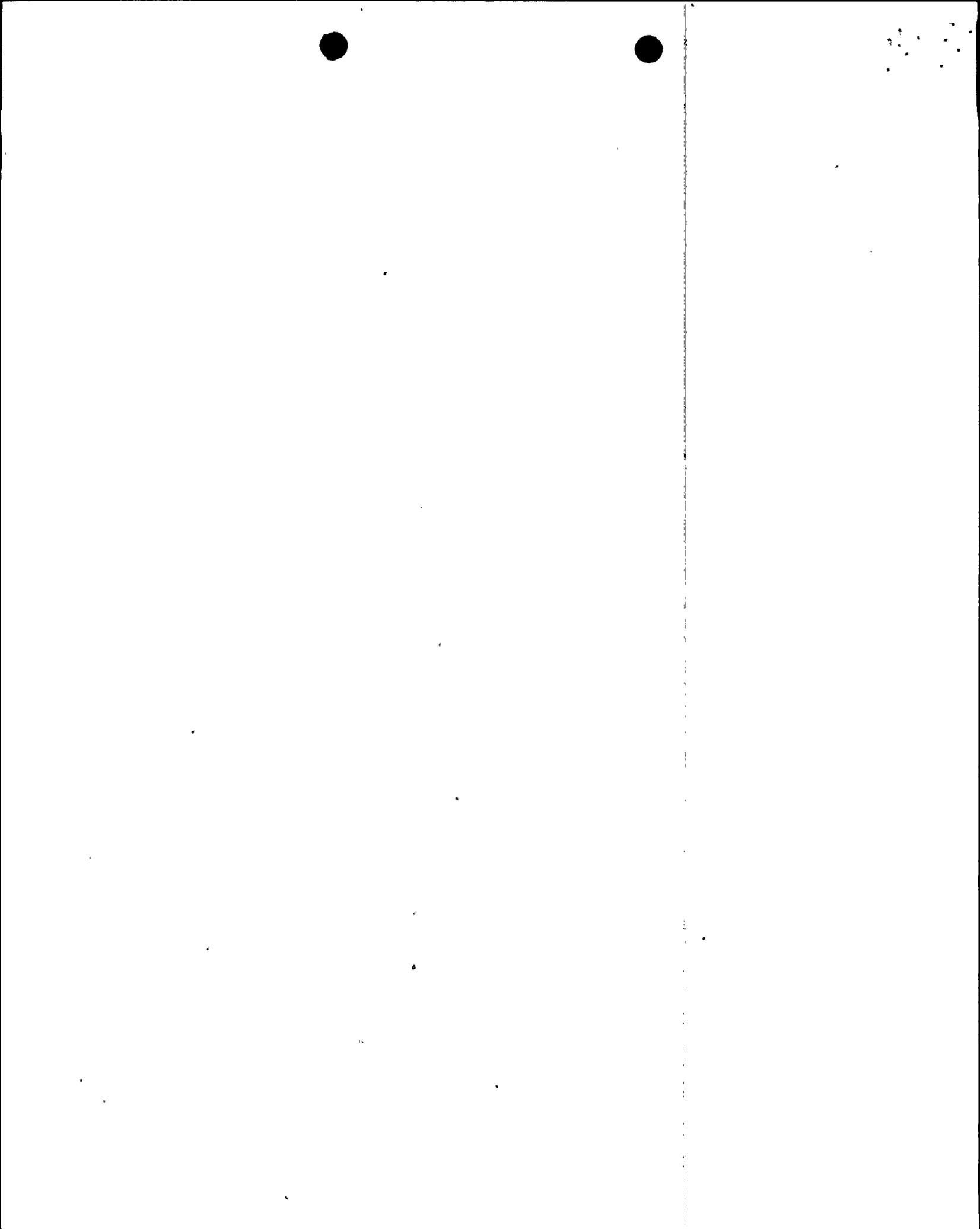
"Crane operators should be trained, qualified and conduct themselves in accordance with Chapter 2-3 of ANSI B30.2-1976, 'Overhead and Gantry Cranes' [5]."

A. Summary of Licensee Statements.

Nothing submitted on the subject of crane operator training. However, material obtained in a subsequent transmittal includes St. Lucie Plant Unit No. 1 procedure No. 0010438 Revision 1. This document outlines the Crane Operator Training and Qualification Program.

B. EG&G Evaluation

The licensee, upon extension of the procedure for Plant Unit No. 1 to No. 2 can show that Chapter 2-3 of ANSI B30.2 has



been used to guide the training and qualification of crane operators.

C. EG&G Conclusion and Recommendations

- (1) The guideline 3 requirement must be recognized and action taken to meet training requirements. The quality of operators, reflected by their training in safe load handling is as important as any other phase of the requirements for control of heavy loads.
- (2) Extend procedure No. 0010438 for Plant Unit No. 1 to Plant Unit No. 2 operators. The program should be documented so it may be audited.

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

Section 2.1.3 (d) of Enclosure 3 of the NRC generic letter requests that lifting devices comply with ANSI B30.9-1971 or ANSI N14.6-1978 as applicable.



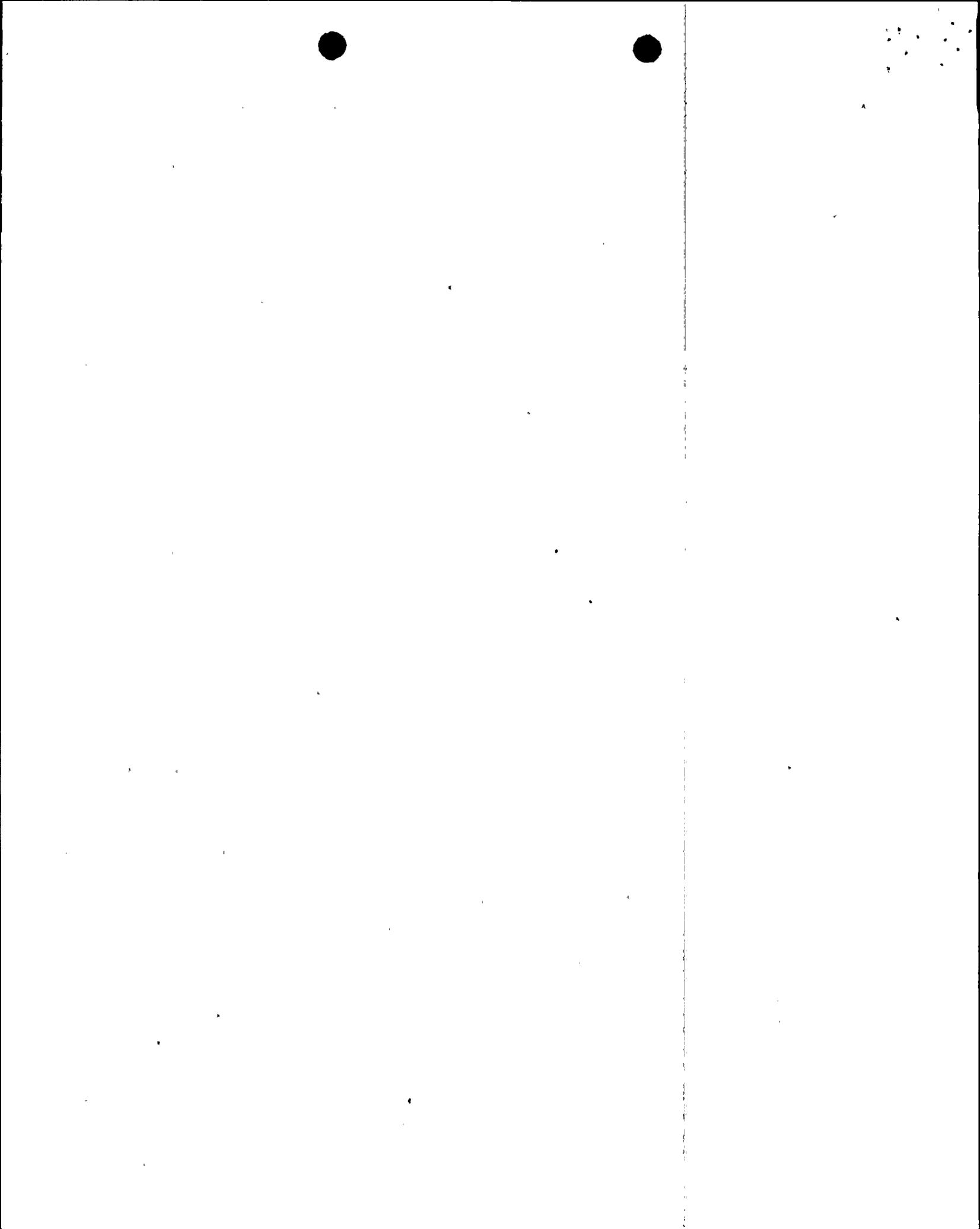
The current St. Lucie Unit No. 1 plant administrative procedure AP0010438 is being revised to require that lifting devices for all load handling systems in Group I meet the requirements of these ANSI standards. This revision will be completed and in effect prior to Unit No. 2 operation. This procedure will include Unit No. 2 in its scope when that unit becomes operational.

B. EG&G Evaluation

The licensee seems to have missed the import of what constitutes a special lifting device. (See the scope of ANSI N14.6.) Their report lists five heavy loads, periodically handled that probably require careful evaluation. The response statement given addresses only administrative procedure whereas the code principally relates to requirements concerning design, fabrication, acceptance testing and maintenance. These code requirements cannot be deferred until Plant Unit 2 is ready for operations.

C. EG&G Conclusions and Recommendations

- (1) Action is required now, to assure that special lifting devices have been specified and built to the ANSI N14.6 requirements and additional requirements given in Guideline #4 of NUREG 0612 Article 5.1.1(4).
- (2) Assure that each special lifting device is built to Guideline #4 and ANSI N14.6 requirements. Maintain adequate records that document this compliance to satisfy an audit.



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

The applicable licensee statement is given in its entirety in 2.3.4 A above.

B. EG&G Evaluation

The licensee statement and data given in their tables provides no information suitable to evaluate. Administrative Procedure No. 0010438 for plant unit No. 1 assigns responsibilities that if acted upon adequately can meet the requirements of Guideline 5.

C. EG&G Conclusions and Recommendations

- (1) It is concluded that insufficient reporting or attention has been given to the selection of, "not specially designed" lifting devices. The load weights listed do not specify if they are combined static and dynamic loading. No details on supplemental data such as called for in ANSI B30.9 are supplied.

(2) The licensee should maintain auditable records that give:

- o suitable data on slings, (not specifically designed) to show that they are adequate to meet the requirements of ANSI B30.9 and guideline 5
- o information that assures suitable markings on any sling that is restricted to a specific crane or cranes

(3) Each sling and its components should be properly tagged to show its safe working load (static plus dynamic).

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

"Section 2.1.3 (e) of Enclosure 3 of the NRC generic letter requests verification that ANSI B30.2-1976 Chapter 2-2 has been invoked with respect to crane inspection, testing and maintenance.

The St. Lucie Unit No. 1 program for crane inspection, testing and maintenance will follow this ANSI standard at the time Unit No. 2 becomes operational and will include Unit No. 2 within its scope at that time and will be available at the plant for review."

B. EG&G Evaluation

Compliance with Chapter 2-2 of ANSI B30.2 requires important inspections, tests, adjustments and measurements before operations. The licensee statement infers that a functional program for Plant Unit 1 will merely be extended to Plant Unit 2. Preparation of Plant Unit 2 for operational readiness appears to be insufficient.

C. EG&G Conclusions and Recommendations

- (1) It is concluded that actions for compliance with code requirements cannot be deferred until the plant is ready to operate and the equipment is needed.
- (2) Prior to the "in operations" program the following preoperational actions must be taken.
 - o Establish and document the adequacy of each hoisting unit for all of the ANSI B30.2 specified preoperational requirements.
 - o Establish and record to what extent, if any, each hoist has been used during plant construction use.

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

"The design of load handling systems follow CMAA #70 or CMAA #74, "Specification for Top Running and Under Running Single Girder Electric Overhead Traveling Cranes" as applicable. The OSHA (Occupational Safety and Health Administration) safety requirements, which include the ANSI requirements, are followed in the design."

B. EG&G Evaluation

The term "follow" is general and has a variety of uses. If we assume that the intended meaning, as used, is "to accept as authority and obey" a major part of this guideline is met. The remaining NUREG 0612 requirement is Chapter 2-1 of ANSI B30.2. The OSHA requirements are excerpts from the ANSI standard but in 29 CFR 1910.179(b)(2) for New and Existing Equipment it states, ". . . shall meet the design specifications of ANSI B30.2. . ." This evaluation indicates the requirements were complied with.

C. EG&G Conclusion and Recommendation

(1) The basic guideline may be met. Those hoists using CMAA #74 (ANSI B30.17) design criteria are acceptable

where they apply, in lieu of ANSI B30.2. What has been the design criteria should be clearly stated.

- (2) Maintain adequate records on the crane design to verify upon audit that ANSI B30.2, CMAA 70 and CMAA 74 requirements as applicable were complied with.

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 statement on this subject is made.

B. EG&G Evaluation

This interim protection is required for operating reactor hoisting units, therefore it has no requirements that apply for St. Lucie Plant, Unit 2, prior to operations.

C. EG&G Conclusions and Recommendations

If hoisting units for the fuel storage pool area have purchase and installation actions pending, it would be beneficial to require them to meet the "single failure proof" standards before installation. The licensee must have either single failure proof hoists or meet acceptable alternate standard technical specifications. This affects licenses^e to operate, so the ability to verify St. Lucie Plant Unit 2 capability for compliance should be established.

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

None

B. EG&G Evaluation

None

C. EG&G Conclusion

The non-operational plant requires no interim measures.

3. CONCLUDING SUMMARY

3.1 Applicable Load Handling Systems

Based on the information provided, EG&G concludes that the list of cranes and hoists supplied by the Licensee as being subject to the provisions of NUREG-0612 is adequate (see Section 2.2.1).

3.2 Guideline Recommendations

Compliance with the seven NRC guidelines for heavy load handling (Section 2.3) are partially satisfied at St. Lucie Plant Unit 2. 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. Maintain auditable data to show that safe load paths follow structural floor members and beams and that potential load drop areas will withstand the impact of a heavy load.b. Maintain information to show how St. Lucie Plant No. 2 will physically mark safe load paths in the plant areas when making a special lift..

Guideline

Recommendation

2. (Section 2.3.2)

- c. Adapt the administrative procedures of Plant Unit 1 for Plant Unit 2 and assure the deviation approval system is written and auditable.

- a. Heavy load handling procedures must include
 - o equipment identification
 - o inspections and acceptance criteria before moving a load
 - o proper steps and their sequence
 - o special precautions.

3. (Section 2.3.3)

- a. Operator training must be established.
- b. The training must meet the requirements of ANSI B30.2 Chapter 2-3.

Guideline

Recommendation

4. (Section 2.3.4)

- a. Identify special lifting devices and assure that each device has been specified and built to the standard requirements of ANSI N14.6 and Guideline #4.

5. (Section 2.3.5)

- a. Assure that standard lifting devices are adequate for the combined static and dynamic load.
- b. Maintain specification data on lifting devices to show that they comply with ANSI B30.9 and Guideline #5.
- c. Assure proper labeling and identification information is affixed to slings.

6. (Section 2.3.6)

- a. Take action to complete preoperational requirements:
 - o Compliance with ANSI B30.2 preoperational requirements

- o Establishing the extent of use of each hoist during construction

7. (Section 2.3.7)

- a. Assure adequacy of records to show that hoisting units meet the specified design 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 St. Lucie Plant Unit 2 are met:

Interim Measure

Recommendation

None indicated

Since the plant is not operational interim protection is not necessary. However if any hoists for fuel storage pool areas have not been purchased the purchase specifications should require the hoist to meet single failure proof requirements.

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. Robert E. Uhrig, (FPL).
Letter to Mr. Darrell G. Eisenhut, US Nuclear Regulatory Commission
Washington, D.C. Subject: St. Lucie Unit 2, Docket No. 50-389.
Control of Heavy Loads, August 6, 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. ST. LUCIE PLANT UNIT 2, NUREG 0612 COMPLIANCE MATRIX

Equipment Designation	Heavy Loads (tons)	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
Intake structure trash rake mono-rail	1	45	1	1	1	1	1	1	1
Component cooling water pump mono-rail	1	3	1	1	1	1	1	1	1
<p>Twelve heavy load handling systems excluded because load drop will not cause damage to system or components required for shut-down or decay heat removal.</p>									
<p>C = Licensee action complies with NUREG-0612 Guideline. NC = Licensee action does not comply with NUREG-0612 Guideline R = Licensee has proposed revisions/modifications designed to comply with NUREG-0612 Guideline. I = Insufficient information provided by the Licensee.</p>									