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FACIL:50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
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MILLER,J.R. Operating Reactors Branch 3

SUBJECT: Forwards addl info re safe loadpaths,testing of crane controls & special lifting devices in response to NRC 830524 review of util response to NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants."

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FLORIDA POWER & LIGHT COMPANY

January 10, 1985
L-85-17

Office of Nuclear Reactor Regulation
Attention: Mr. James R. Miller, Chief
Operating Reactors Branch #3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Miller:

Re: St. Lucie Unit 1
Docket No. 50-335
Control of Heavy Loads

A draft technical evaluation report was provided with the NRC letter dated May 24, 1983. This report provided the results of the NRC contractor's review of Florida Power & Light's response to NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants" for St. Lucie Unit 1.

Additional information concerning safe loadpaths, testing of crane controls and special lifting devices is provided in the attachment to this letter.

Should you or your staff have any questions on this information, please contact us.

Very truly yours,

J. W. Williams, Jr.
Group Vice President
Nuclear Energy

JWW/PLP/js

Attachment

cc: J. P. O'Reilly, Region II
Harold F. Reis, Esquire
PNS-LI-85-016-1

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ATTACHMENT

Re: St. Lucie Unit 1
Docket No. 50-335
Control of Heavy Loads

FPL responses to draft Technical Evaluation Report items.

2.1 GENERAL GUIDELINES

2.1.1 NUREG-0612, Overhead Heavy Load Handling Systems

Reviewer Conclusion and Recommendation

The Licensee should reevaluate the turbine building gantry crane for compliance with the general guidelines of NUREG-0612. Evaluation of those other handling systems currently subject to compliance is consistent with NUREG-0612 guidance.

Response

The turbine building gantry crane is prevented from travel over the steam trestle area by electrical interlocks. These interlocks can be bypassed by way of key-lock switches. However, the key to these switches is administratively controlled under Administrative Procedure AP 0010123, Administrative Control of Locks, Valves and Switches. This procedures requires that the Nuclear Plant Supervisor or Assistant Nuclear Plant Supervisor determine the work to be performed and evaluate its effect on plant safety and operation prior to issue of the key.

2.2.2 Safe Load Paths [Guideline 1, NUREG-0612, Section 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."

Reviewer Conclusion and Recommendations

St. Lucie Unit 1 partially complies with Guideline 1 of NUREG-0612. In order to comply fully, the Licensee should perform the following:

1. Develop load paths for major heavy loads handled inside of containment.

2. Provide visual aids to assist the crane operator in identifying safe load paths and exclusion areas.

Response

FPL will prepare specific load paths for major loads which routinely take the same route or routes when carried. These paths will be referenced in the applicable procedure, and will be similar to the St. Lucie Unit 2 paths provided with our letter L-84-327 dated November 9, 1984. These paths will be prepared by February 15, 1985. In addition, FPL uses an individual to lead the heavy load over the path when handling is required.

2.1.3 Load Handling Procedures [Guideline 2, NUREG-0612, Section 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."

Reviewer Conclusion

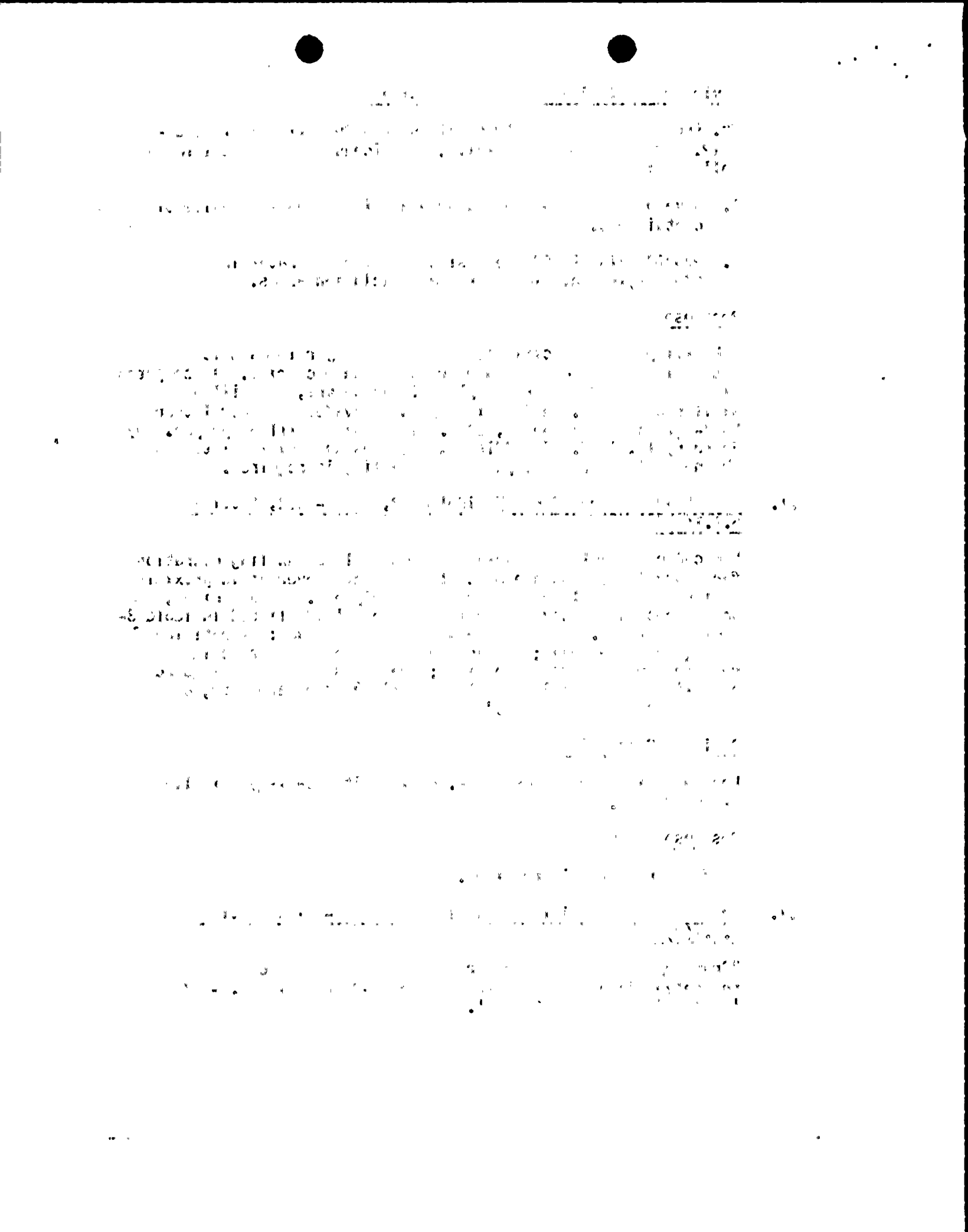
Load handling procedures at St. Lucie Unit 1 satisfy Guideline 2 of NUREG-0612.

Response

No further action is required.

2.1.4 Crane Operator Training [Guideline 3, NUREG-0612, Section 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'.



Review Conclusion and Recommendations

Crane operation at St. Lucie Unit 1 partially complies with Guideline 3. The Licensee should make the following modifications to the existing training program and crane operating procedures:

1. Crane motion controls should be tested prior to initial load movements on each shift unless unique conditions at shift change prohibit the testing of certain controls.

2. Specific criteria should be established for deferring upper limit switch testing and should include consideration of operator response time necessary to deenergize the crane in the event of a control system malfunction.

Response

The St. Lucie Maintenance Crane Operation Training Program describes the daily testing that shall be performed to cranes before operation. The testing requirements for the cranes include the following:

Daily testing shall be performed to cranes before operation.

1. All upper limit switches shall be checked on hooks to be used without a load on the hook at the beginning of each work shift. Each motion shall be inched into its limit switch, or run in at low speeds, unless unique condition at shift change prohibits the testing (load already on hook).

2. Bridge limit switches shall be checked at the beginning of each work shift. (This does not include end stops).

3. Trolley limit switches shall be checked at the beginning of each work shift. Switch on cantilevers for gantry cranes on 1 and 2 need not be tested unless cantilevers are to be used.

4. Crane motion controls shall be tested prior to initial load movements on each shift unless unique conditions at shift change prohibit the testing of certain controls (load already on hook).

2.1.5 Special Lifting Devices [Guideline 4, NUREG-0612, Section 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'. This standards 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 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) of the load and of the intervening components of the special handling device."

Reviewer Conclusion

Compliance with Guideline 4 cannot be determined from the information provided by the licensee.

Response

See Enclosure 1.

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

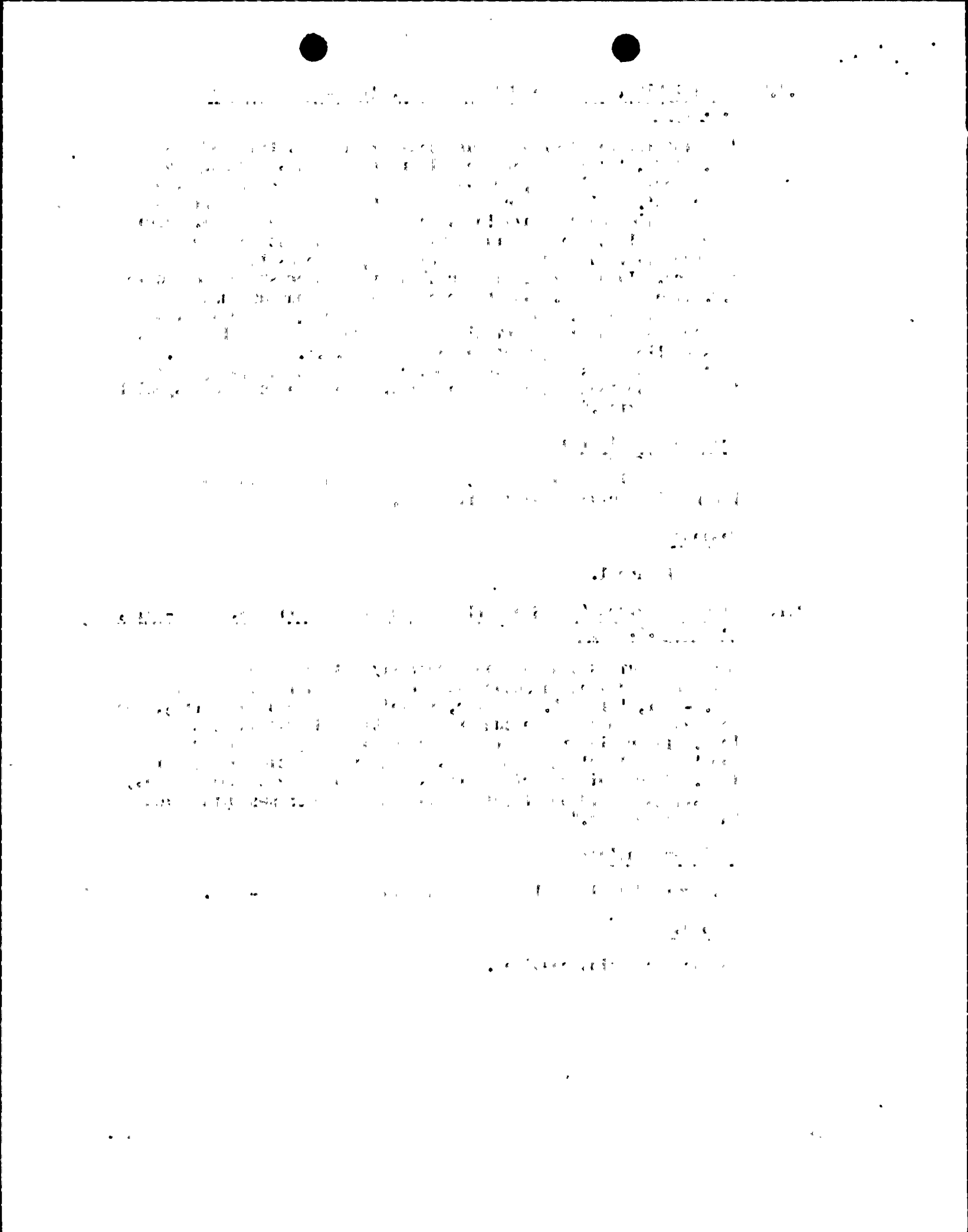
"Lifting devices that are not specially designed should be installed and used in accordance with the guidelines of ANSI B30.9-1971, 'Slings'. However, in selecting the proper sling, the load used should be the sum of the static and maximum dynamic load. The rating identified on the sling should be in 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."

Reviewer Conclusion

St. Lucie Unit 1 complies with Guideline 5 of NUREG-0612.

Response

No further action required.



2.1.7 Cranes (Inspection, Testing, and Maintenance) [Guideline 6, NUREG-0612, Section 5.1.1(6)]

"The crane should be inspected, tested, and maintained in accordance with Chaper 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)."

Reviewer Conclusion

St. Lucie Unit 1 complies with Guideline 6 of NUREG-0612.

Response

No further action required.

2.1.8 Crane Design [Guideline 7, NUREG-0612, Section 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'. 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."

Reviewer Conclusion

Compliance with Guideline 7 cannot be determined from the information provided by the Licensee. Further information is required to complete the independent evaluation of crane design.

Response

Information to address the reviewer concerns for Guideline 7 was provided in our letters L-83-374 dated June 28, 1983, and L-83-463 dated August 26, 1983.

2.2 INTERIM PROTECTION MEASURES

2.2.1 Technical Specifications [Interim Protection Measure 1, NUREG0612, Section 5.3(1)]

"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 PWRs and Standard Technical Specification 3.9.6.2, 'Crane Travel,' for 'BWRs', to prohibit handling of heavy loads over fuel in the storage pool until implementation of measures which satisfy the guidelines of Section 5.1."

Reviewer Evaluation and Conclusion

St. Lucie Unit 1 complies with Interim Protection Measure 1.

Response

No further action required.

2.2.2 Administrative Controls [Interim Protection Measures 2, 3, 4, and 5, NUREG-0612, Section 5.3(2)-5.3(5)]

"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]."

Reviewer Evaluations, Conclusions, and Recommendations

Evaluations, conclusions, and recommendations are contained in discussions of the respective general guidelines in Section 2.1.2, 2.1.3, 2.1.4, and 2.1.7.

Response

See responses to applicable sections above.

2.2.3 Special Review for Heavy Loads Handled over the Core [Interim Protection Measure 6, NUREG-0612, Section 5.3.6]

"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 chould 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."

Reviewer Evaluation and Conclusion

St. Lucie Unit 1 complies with Interim Protection Measure 6.

Response

No further action required.

ENCLOSURE 1

Re: St. Lucie Unit 1
Docket No. 50-335
Control of Heavy Loads

ANSI N14.6 provides guidelines for special lifting devices for shipping containers weighing 10,000 pounds or more for nuclear materials. The guidelines in this standard were recommended for adoption for the special lifting devices in NUREG-0612.

St. Lucie Unit 1 complies with this standard except for the general cases listed below and the device specific cases provided in the attachment. We have determined that the exceptions noted are acceptable and do not affect the capability of the special lifting devices to safely lift the designated loads.

Section 5.1.3

Verifying by scheduled periodic testing that the special lifting device continues to meet its performance criteria and continues to be capable of reliable and safe performance of its functions, and providing a system that indicates the date of expiration of the validity of the test.

Response

This testing will be performed in accordance with Section 5.3.1(2).

Section 5.1.6

Maintaining a full record of the history of the special lifting device or component, including documentation of required testing, all uses of the device, any incidents in which the device or any of its parts may have been loaded beyond the loads for which it was qualified, damage, distortion, replacement, repair, alterations, and inspections.

Response

The records of special lifting devices will be maintained in the plant work order files.

SUMMARY OF NONCOMPLIANCE TO NUREG-0612 - GUIDELINE #4
FOR THE ST. LUCIE UNIT NO. 1 REACTOR VESSEL CLOSURE HEAD LIFT RIG
WITH ANSI-N14.6-1978

Specific section of ANSI-N14.6-1978 (Summary of Paragraph and Non-compliance)

3.2.6 Drop weight or charpy impact testing.

There are no test reports available for vital members identified as piece numbers 229-03 and 229-06, since the material was taken from C-E stock.

Response Material acceptability can be demonstrated since these members were fabricated from Combustion Engineering stock which was purchased to CE Specification PIF3.

4.1.3 Verify selection and use of material.

There are no mill test reports and material certifications available for items 229-03 and 229-06.

Response Material acceptability can be demonstrated since these members were fabricated from Combustion Engineering stock which was purchased to CE Specification PIF3.

5.1.5.2 Suitable markings.

There is no nameplate on the closure head lift rig.

Response Nameplates were not provided for the special lift rigs. Nameplates are not considered necessary since the special lift rigs are only used to lift designated loads.

5.2.1 Load test to 150% and appropriate inspection prior to initial use.

The rig was not load tested by the vendor.

Response The closure head lift rig was not 150% load tested as this could result in overstressing in certain local areas of the lift rig.

SUMMARY OF NONCOMPLIANCE TO NUREG-0612 - GUIDELINE #4
FOR THE ST. LUCIE UNIT NO. 1 INTERNALS AND UGS LIFT RIGS
WITH ANSI-N14.6-1978

Specific section of ANSI-N14.6-1978 (Summary of Paragraph and Non-compliance)

3.2.6 Dead weight or charpy impact testing

Internals and UGS rigs were dead weight tested to 1.25 times operations) load. No other impact test performed.

Response No further testing is warranted.

5.2.1 Load test to 150% and appropriate inspection prior to initial use.

Internals and UGS lift rigs were load tested to 1.25 times operational load.

Response No further testing is warranted.