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ENCLOSURE 1

TECHNICAL EVALUATION REPORT

CONTROL OF HEAVY LOADS (C-10)

FLORIDA POWER & LIGHT COMPANY

TURKEY POINT UNITS 3 AND 4

NRC DOCKET NO. 50-250/251

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FOREWORD

This Technical Evaluation Report was prepared by Franklin Research Center under a contract with the U.S. Nuclear Regulatory Commission (Office of Nuclear Reactor Regulation, Division of Operating Reactors) for technical assistance in support of NRC operating reactor licensing actions. The technical evaluation was conducted in accordance with criteria established by the NRC.

Mr. I. H. Sargent, Mr. C. Bomberger, and Mr. D. Vito contributed to the technical preparation of this report through a subcontract with WESTEC Services, Inc.

1. INTRODUCTION

1.1 PURPOSE OF REVIEW

This technical evaluation report documents the an independent review of general load handling policy and procedures at the Florida Power and Light Company's Turkey Point Units 3 and 4. This evaluation was performed with the following objectives:

- to assess conformance to the general load handling guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants" [1], Section 5.1.1
- to assess conformance to the interim protection measures of NUREG-0612, Section 5.3.

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 in 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 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-part 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, Section 5.1.1, is to ensure that all load handling systems at

nuclear power plants are designed and operated so 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, Sections 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, based on defense-in-depth, was to ensure that all load handling systems are designed and operated so that their probability of failure is appropriately small. The intent of the guidelines is to ensure that licensees of all operating nuclear power plants perform the following:

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

Staff guidelines resulting from the foregoing are tabulated in Section 5 of NUREG-0612. Section 6 of NUREG-0612 recommended that a program be initiated to ensure that these guidelines are implemented at operating plants.

1.3 PLANT-SPECIFIC BACKGROUND

On December 22, 1980, the NRC issued a letter [3] to Florida Power and Light Company (FPL), the Licensee for the Turkey Point Units 3 and 4, requesting that the Licensee review provisions for the handling and control of heavy loads at the Turkey Point plant, 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 September 4, 1981, FPL provided its response [4] to this request. Additional information was provided in a submittal on November 12, 1981 [5]. In response to a telephone conference call involving FPL, the NRC, and the reviewer on February 12, 1982, the Licensee provided a subsequent response on August 10, 1982 [6]. This final TER is based on information provided in References 4, 5, and 6.

2. EVALUATION AND RECOMMENDATIONS

This section presents a point-by-point evaluation of load handling provisions at the Turkey Point plant with respect to NRC staff guidelines provided in NUREG-0612. Separate subsections are provided for both the general guidelines of NUREG-0612, Section 5.1.1 and the interim measures of NUREG-0612, Section 5.3. In each case, the guideline or interim measure is presented, Licensee-provided information is summarized and evaluated, and a conclusion as to the extent of compliance, including recommended additional action where appropriate, is presented. These conclusions are summarized in Table 2.1.

2.1 GENERAL GUIDELINES

The NRC has established seven general guidelines to provide the defense-in-depth appropriate for the safe handling of heavy loads. They are identified under the following topics in Section 5.1.1 of NUREG-0612:

- o Guideline 1 - Safe Load Paths
- o Guideline 2 - Load Handling Procedures
- o Guideline 3 - Crane Operator Training
- o Guideline 4 - Special Lifting Devices
- o Guideline 5 - Lifting Devices (Not Specially Designed)
- o Guideline 6 - Cranes (Inspection, Testing, and Maintenance)
- o Guideline 7 - Crane Design.

These seven guidelines should be satisfied by all overhead handling systems and programs used 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.

2.1.1 Overhead Heavy Load Handling Systems

a. Summary of Licensee Statements and Conclusions

The Licensee conducted a review of all overhead handling systems at the Turkey Point plant to determine which overhead handling systems are subject to

Table 2.1 Turkey Point Units 3 and 4/NUREG-0612 Compliance Matrix

Heavy Loads	Weight or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane - Test and Inspection	Guideline 7 Crane Design	Interim Measure 1 Technical Specifications	Interim Measure 6 Special Attention
1. Reactor Polar Crane Units 3 & 4	135/35	--	--	P	--	--	C	P	--	C
Reactor Missile Shields	60	P	C	--	--	C	--	--	--	C
Pressurizer Missile Shields	25.6	P	C	--	--	C	--	--	--	C
Polar Crane Load Block	6	P	C	--	--	--	--	--	--	C
Reactor Vessel Head	57.5	P	C	--	NC	--	--	--	--	C
Upper Internals	42	P	C	--	NC	--	--	--	--	C
2. Fuel Cask Crane	105/15	--	--	P	--	--	C	P	NC	--
Spent Fuel Shipping Cask	25	P	C	--	NC	--	--	--	NC	--
Fuel Cask Crane Load Block	4.8	P	C	--	--	--	--	--	NC	--
3. Fuel Pool Bulkhead Monorail	3	--	--	P	--	--	C	P	NC	--
Fuel Pool Bulkhead	1.5	--	C	--	--	C	--	--	NC	--

C = Licensee action complies with NUREG-0612 Guideline.
NC = Licensee action does not comply with NUREG-0612 Guideline.
-- = Not applicable.
P = Licensee action partially complies with NUREG-0612.

Table 2.1 (Cont.)

Heavy Loads	Weight or Capacity (Tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane - Test and Inspection	Guideline 7 Crane Design	Interim Measure 1 Technical Specifications	Interim Measure 6 Special Attention
4. Turbine Gantry Cranes, Units 3 & 4	445/35	P	C	P	NC	C	C	P	--	--
5. Intake Structure Gantry Crane	25	P	C	P	NC	C	C	P	--	--
6. Charging Pump Monorails	8	--	C	P	--	C	C	P	--	--
7. Safety Injection Pump Monorail	5	--	C	P	--	C	C	P	--	--
8. Main Steam Platform Monorail	1	--	C	P	--	C	C	P	--	--

this review. The Licensee identified the following overhead handling systems as those from which a load drop could result in damage to plant safe shutdown or decay heat removal systems, taking no credit for interlocks, technical specifications, operating procedures, detailed structural analysis, or system redundancy:

- o charging pump monorails
- o safety injection pump monorails
- o main steam platform monorails
- o turbine gantry cranes
- o reactor polar cranes
- o fuel pool bulkhead monorail
- o spent fuel cask crane
- o intake structure bridge crane.

The Licensee has excluded the following load handling devices from NUREG-0612 compliance because the devices are used during refueling operations and do not handle loads weighing more than one spent fuel assembly with a handling tool:

- o reactor cavity manipulator crane
- o fuel transfer machine
- o spent fuel bridge crane.

The Licensee also provided a tabulation of load handling systems for which they have determined by inspection that there is sufficient physical separation between any load impact point and any safety-related component.

b. Evaluation and Conclusion

The Licensee's conclusions concerning those load handling devices subject to the general guidelines of NUREG-0612 are consistent with the NRC objectives of improving load handling safety and reliability.

2.1.2 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."

a. Summary of Licensee Statements and Conclusions

The Licensee has stated that "safe load path areas" have been defined for the turbine gantry cranes, reactor polar cranes, spent fuel cask crane, and intake structure bridge crane. These safe load path areas and restricted zones were developed by the FPL Power Plant Engineering Department. Safe load path drawings indicate certain areas where the handling of loads greater than 1760 pounds is restricted. In some areas, the handling of loads greater than 5 tons is restricted. The bases for these restrictions are the different capabilities of the structures in the area to withstand a dropped load and the potential for damage to irradiated fuel and safe shutdown equipment.

FPL has indicated that no safe load path areas have been provided for the remaining load handling systems tabulated in Section 2.1.1. These systems have been determined to be exempt from these requirements on the basis of several crane-specific considerations.

- The reactor cavity manipulator crane, fuel transfer machine, and spent fuel bridge crane do not handle loads weighing more than one fuel assembly plus a handling tool. The consequences of a fuel handling accident have been evaluated and determined to be acceptable in the Turkey Point Final Safety Analysis Report.

- The fuel pool bulkhead, charging pump, safety injection pump, and main steam platform monorail physically restrict load handling to a single path. In the first three cases, special precautions and instructions will be provided to meet the intent of the safe load path requirement. In the case of the charging and safety injection pumps, for example, handling heavy loads over operating pumps, when required for safe shutdown, will be forbidden. The main steam platform monorails handle only safety-related valves which can be removed only when the plant is shut down and their safety function is not required.

FPL does not agree that marking the safe load paths on the floors or structures is a practical or necessary means of informing the operator of the safe areas. The sketches which are readily available to the operator at the hoist controls are easy to understand and serve the same purpose as floor markings. Also, floor markings can be obstructed by equipment and are not feasible in certain areas (e.g., the refueling pool).

Plant Maintenance Procedure 0736 "Heavy Load Handling" requires written alternatives for deviations from the safe load paths. These alternatives are approved by the Maintenance Superintendent. The Plant Nuclear Safety Review Committee (PNSC) approved this procedure and has delegated this authority to the Maintenance Superintendent. The Maintenance Superintendent is a member of the PNSC and is responsible for all maintenance activities at the nuclear power plant. It is FPL's judgment that the individual filling this senior maintenance position can determine when a safe load path variation requires full review by the PNSC, and as a member of that group he would bring the situation to the attention of that group.

b. Evaluation

Safe load paths at Turkey Point Units 3 and 4 are not consistent with the guidance in Section 5.1.1(1) of NUREG-0612. A review of the Licensee's response and sketches indicates that areas have been established in which the movement of heavy loads is restricted or excluded; however, specific pathways for the movement of loads, as specified in Guideline 1, have not been designated.

The use of exclusion areas is reasonable where the size and number of potentially hazardous impact areas is relatively small compared to the overall coverage of the handling device, such as in the turbine building, the auxiliary building, and the intake structure. However, even though exclusion areas may be acceptable, the areas should restrict movement of all heavy loads, taking no credit for structural analyses.

Furthermore, inside containment, it is not apparent that all paths in areas other than the restricted areas noted are equally desirable for heavy

load movement considering the objective to minimize passage over safe shutdown equipment and to use structural members where feasible. The intent of NUREG-0612 is to provide the crane operator with load paths established on the basis of an engineering review, which avoid important equipment to the extent practical, and which provide fairly detailed directions for load movement by the operators.

The Licensee's position concerning safe load paths for the reactor cavity manipulator crane, the fuel transfer machine, the spent fuel bridge crane, and various other monorails is consistent with the guidance in NUREG-0612.

Load path visual aids should be provided to crane operators so that the operators can concentrate on movement of the load. These visual aids are used to clearly identify those areas where movement of heavy loads will occur. Alternative methods of providing visual aids such as matchmarking the crane, identifying physical boundaries, or the use of dedicated load handling supervisors are possible approaches which provide operator assistance equivalent to floor markings.

The handling of load path deviations meets the intent of Guideline 1 because the authority to approve deviations is vested in a designated member of the plant safety review committee.

c. Conclusion and Recommendations

Turkey Point Units 3 and 4 partially comply with Guideline 1 of NUREG-0612. In order to fully comply, the Licensee should complete the following actions:

- Provide safe load paths for major heavy loads handled inside containment.
- Provide visual aids to identify safe load paths and restricted areas.

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."

a. Summary of Licensee Statements and Conclusions

The Licensee has stated that Plant Maintenance Procedure 0736, "Heavy Load Handling," governs overall load handling operations in the plant. Special procedures have been prepared for those loads which are handled periodically over the reactor vessel. These procedures identify the required equipment; the inspection and acceptance criteria required before movement of the load; the steps and proper sequence to be followed in handling the load; and the load path and any special precautions. These special procedures include:

- o reactor missile shields
- o reactor vessel head
- o upper internals
- o spent fuel shipping casks
- o pressurizer missile shields.

b. Evaluation

Load handling procedures used at Turkey Point Units 3 and 4 meet the intent of Section 5.1.1(2) of NUREG-0612. Specific procedures have been developed for the major loads, and a generic procedure covers the remaining load handling events. Further, the Licensee's statements indicate that the procedures contain the information identified in Section 5.1.1(2) of NUREG-0612.

c. Conclusion

Turkey Point Units 3 and 4 comply with Guideline 2 of NUREG-0612.

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' [7]."

a. Summary of Licensee Statements and Conclusions

The Licensee has stated that a training program in accordance with ANSI B30.2-1976 has been developed and that the company physical for new employees meets or exceeds the physical requirements of the ANSI standard. The following exceptions to the ANSI standard have been taken:

1. Eye test of 20/40 in both eyes for new employees will be required.

2. The crane deadman switch, instead of the mainline disconnect, will be used to secure power because of the power requirements of the crane motor heaters.

3. Only those controls necessary for crane operation will be tested before beginning a new shift.

4. At shift change, the upper limit device will be tested under no load unless a load is hanging from the hook at shift change or unless no crane operation in the area of the upper limit is anticipated.

5. Safety during maintenance work on cranes will be in accordance with the plant clearance procedures.

b. Evaluation

Turkey Point Units 3 and 4 substantially comply with Section 5.1.1(3) of NUREG-0612 since a program has been developed which is generally consistent with ANSI B30.2-1976, Chapter 2-3. The exceptions in eye testing, crane power disconnecting, controls testing, safety during maintenance, and upper limit switch testing are not considered to result in a substantial deviation from the intent of NUREG-0612. The eye testing and safety during maintenance requirements of ANSI B30.2 are intended to provide a baseline for all operators which is satisfied by FP&L program requirements. Further, disconnecting power at the deadman switch so that main power will still be available to the motor heaters while crane motion is secured is an acceptable alternative. Shift testing of only those crane controls necessary for crane operation is satisfactory with the understanding that testing is monitored to ensure proper implementation. Similarly, while it is apparent that upper limit switch testing is inappropriate with an attached load or when lifts at the lower extreme of hook travel are planned, specific definition is required as to when upper limit switch testing is necessary.

c. Conclusion and Recommendations

Turkey Point Units 3 and 4 partially comply with Guideline 3. The Licensee should modify existing crane operating procedures to ensure that upper limit switch testing will be performed if the hook is unloaded at the beginning of a shift AND if load movements above the midpoint of total hook travel are anticipated during the following shift.

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' [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) of the load and of the intervening components of the special handling device."

a. Summary of Licensee Statements and Conclusions

The Licensee has contacted the Turkey Point NSSS vendor to review the design of the reactor vessel internals and head lifting rigs, load cell, load cell linkage, and the reactor coolant pump motor lifting rig to determine the acceptability of these components to the criteria of ANSI N14.6-1978 as supplemented by NUREG-0612, Section 5.1.1(4).

b. Evaluation

Insufficient information has been provided to allow a determination of compliance with respect to Guideline 4. The Licensee should provide an evaluation concerning compliance with ANSI N14.6 for all special lifting devices. Further, in performing their evaluation, the Licensee should address the imposition of static and dynamic loads when assessing design stresses.

The intent of Guideline 4, in addition to determining that special lifting devices have been designed and fabricated in a manner consistent with high reliability, is also to make certain that appropriate steps are taken to ensure that these devices are inspected, tested, and maintained so as to ensure continued reliability. Guidance for a program to support the goal is contained in Section 5 of ANSI N14.6. FPL has provided no information addressing these issues.

c. Conclusion and Recommendations

Turkey Point Units 3 and 4 do not satisfy Guideline 4 of NUREG-0612. The Licensee should implement an acceptance and continuing compliance testing program for special lifting devices in accordance with Section 5.0 of ANSI N14.6-1978 prior to the next use of these devices. Further, the Licensee should provide a design comparison of the special lifting designs relative to the criteria in ANSI N14.6-1978.

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' [9]. 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 and Conclusions

The Licensee has stated that the program for sling use and maintenance at Turkey Point Units 3 and 4 meets the requirements of ANSI B30.9. Sling selection is not based on dynamic loading, and it is presumed that sufficient margin is present from the 5:1 safety factor. In any event, the hoisting speeds at Turkey Point are relatively slow and any contribution from a dynamic effect would be insignificant. Further, the rated capacity is marked on the slings. These slings are inspected yearly by an outside contractor, and worn slings are replaced.

b. Evaluation

The program for sling selection and maintenance at Turkey Point Units 3 and 4 meets the intent of Section 5.1.1(5) of NUREG-0612 based on the Licensees confirmation of compliance with ANSI B30.9-1971.

c. Conclusion

Turkey Point Units 3 and 4 comply with Guideline 5 of NUREG-0612.

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 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 Statement and Conclusion

The Licensee has stated that the Turkey Point crane inspection, testing and maintenance program complies with the requirements of ANSI B30.2-1976 with the exception that tests and inspections are performed prior to use where it is not practical to meet the frequencies of ANSI B30.2 for periodic inspection and test or where the frequency of crane use is less than the specified inspection and test frequency.

b. Evaluation and Conclusion

Turkey Point Units 3 and 4 comply with Guideline 6 of NUREG-0612 based on the Licensee's confirmation of compliance with ANSI B30.2-1976 with the exceptions allowed for in Section 5.1.1(6) of NUREG-0612.

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' [10]. 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 and Conclusions

"The overhead traveling bridge cranes listed in Table 1 of this report are designed to the Electric Overhead Crane Institute Specification 61. 'Specifications for Electric Overhead Traveling Cranes' (EOCI #61) and the applicable ANSI safety standards in effect at the time of the manufacture of the cranes. These specifications and standards are the predecessors of CMAA #70 and ANSI B30.2-1976 now in effect and are similar.

The primary difference between the EOCI #61 and CMAA #70 specifications are changes in the design of bridge girders. These changes reflected in the CMAA #70 specification allow the use of higher allowable stresses for the better grade materials available today and also provide new design formulas. These changes are a result of advancements in the state of the art of girder structural design, allowing the use of lighter, more efficient structures and do not increase the conservativeness of the design from the older EOCI #61 specification."

b. Evaluation

Cranes at the Turkey Point plant satisfy, to a considerable extent, the criteria of Guideline 7, since the cranes were procured to accepted industrial standards at the time of manufacture. However, FPL did not specificially address the more restrictive design requirements imposed by CMAA-70, which could affect the crane's ability to safely handle a heavy load.

A comparison of the recommendations of CMAA-70 with those of EOCI-61 and has identified several areas where revisions incorporated into CMAA-70 may affect crane safety and should therefore be evaluated to determine if the intent of NUREG-0612 is met.

1. Impact allowance. CMAA-70, Section 3.3.2.1.1.3 requires that crane design calculations include an impact allowance of 0.5% of the load per foot per minute of hoisting speed but not less than 15%. EOCI-61 specifies only a

minimum allowance of 15%. Consequently, for cranes with hoist speeds in excess of 30 feet per minute, it is possible that the impact allowance applied under EOCI-61 will be less than that required by CMAA-70. This variation is not expected to be of consequence for the overhead cranes subject to this review since these cranes, in general, operate with hoist speeds below 30 feet per minute, most commonly in the range of 3 to 10 feet per minute.

2. Torsional forces. CMAA-70, Section 3.3.2.1.3 requires that twisting moments due to overhanging loads and lateral forces acting eccentric to the horizontal neutral axis of a girder be calculated on the basis of the distance between the center of gravity of the load, or force center line, and the girder shear center measured normal to the force vector. EOCI-61 states that such moments are to be calculated with reference to girder center of gravity. For girder sections symmetrical about each principal central axis (e.g., box section or I-beam girders commonly used in cranes subject to this review), the shear center coincides with the centroid of the girder section and there is no difference between the two requirements. Such is not the case for nonsymmetrical girder sections (e.g., channels).

3. Longitudinal stiffeners. CMAA-70, Section 3.3.3.1 specifies (1) the maximum allowable web depth/thickness (h/t) ratio for box girders using longitudinal stiffeners and (2) requirements concerning the location and minimum moment of inertia for such stiffeners. EOCI-61 allows the use of longitudinal stiffeners but provides no similar guidance. Requirements of CMAA-70 represent a codification of girder design practice, and they are expected to be equivalent to design standards employed in cranes built to EOCI-61 specifications.

4. Allowable compressive stress. CMAA-70, Section 3.3.3.1.3 identifies allowable compressive stresses to be approximately 50% of yield strength of the recommended structural material (A-36) for girders, where the ratio of the distance between web plates to the thickness of the top cover plate (b/c ratio) is less than or equal to 38. Allowable compressive stresses decrease linearly for b/c ratios in excess of 38. EOCI-61 provides a similar method for calculating allowable compressive stresses except that the allowable stress decreases from approximately 50% of yield only after the b/c ratio

exceeds 41. Consequently, structural members with b/c ratios in the general range of 38 to 52 designed under EOCI-61 will allow a slightly higher compressive stress than those designed under CMAA-70. This variation is not expected to be of consequence for cranes subject to this review since b/c ratios of structural members are expected to be less than 38.

5. Fatigue considerations. CMAA-70, Section 3.3.3.1.3 provides substantial guidance with respect to fatigue failure by indicating allowable stress ranges for various structural members in joints under repeated loads. EOCI-61 does not address fatigue failure. The requirements of CMAA-70 are not expected to be of consequence for cranes subject to this review since the cranes are not generally subjected to frequent loads at or near design conditions (CMAA-70 provides allowable stress ranges for loading cycles in excess of 20,000) and are not generally subjected to stress reversal (CMAA-70 allowable stress range is reduced to below the basic allowable stress for only a limited number of joint configurations).

6. Hoist rope requirements. CMAA-70, Section 4.2.1 requires that the capacity load plus the bottom block divided by the number of parts of rope not exceed 20% of the published rope breaking strength. EOCI-61 requires that the rated capacity load divided by the number of parts of rope not exceed 20% of the published rope breaking strength. The effect on crane safety margins of this variation depends on the ratio of the weights of the load block and the rated load.

7. Drum design. CMAA-70, Section 4.4.1 requires that the drum be designed to withstand combined crushing and bending loads. EOCI-61 requires only that the drum be designed to withstand maximum load bending and crushing loads with no stipulation that these loads be combined. This variation is not expected to be of consequence since the requirements of CMAA-70 represent the codification of good engineering practice which should have been incorporated in cranes built to EOCI-61 specifications although a specific requirement was not contained in EOCI-61.

8. Drum design. CMAA-70, Section 4.4.3 provides recommended drum groove depth and pitch. EOCI-61 provides no similar guidance. The recommen-

dations in CMAA-70 constitute a codification of good engineering practice with regard to reeving stability and reduction of rope wear and are not expected to differ substantially from practices employed in the design of cranes subject to this review and built to EOCI-61 specifications.

9. Gear design. CMAA-70, Section 4.5 requires that gearing horsepower rating be based on certain American Gear Manufacturers Association Standards and provides a method for determining allowable horsepower. EOCI-61 provides no similar guidance. The recommendations in CMAA-70 constitute a codification of good engineering practice for gear design and are not expected to differ substantially from the practices employed in the design of cranes subject to this review and built to EOCI-61 specifications.

10. Bridge brake design. CMAA-70, Section 4.7.2.2 requires that bridge brakes, for cranes with cab control and the cab on the trolley, be rated at least 75% of bridge motor torque. EOCI-61 requires a brake rating of 50% of bridge motor torque for similar configurations. A cab-on-trolley control arrangement is not expected for cranes subject to this review.

11. Hoist brake design. CMAA-70, Section 4.7.4.2 requires that hoist holding brakes, when used with a method of control braking other than mechanical, have torque ratings no less than 125% of the hoist motor torque. EOCI-61 requires a hoist holding brake torque rating of no less than 100% of the hoist motor torque without regard to the type of control brake employed. This variation is not expected to be of consequence for cranes subject to this review since mechanical load brakes were typically specified for cranes procured when EOCI-61 was the standard. The addition of a holding brake safety margin in conjunction with electric control braking is a codification of good engineering practice. Some manufacturers provide holding brakes rated at up to 150% of hoist motor torque when used with electrical control braking systems.

12. Bumpers and stops. CMAA-70, Section 4.12 provides substantial guidance for the design and installation of bridge and trolley bumpers and stops for cranes which operate near the ends of bridge and trolley travel. No similar guidance is provided in EOCI-61. This variation is not expected to be

of significance for cranes subject to this review since these cranes are not expected to be operated under load at substantial bridge or trolley speed near the end of travel. Further, the guidance of CMAA-70 constitutes the codification of good engineering practice and will be expected to be satisfied by equivalent requirements for cranes procured according to EOCI-61.

13. Static control systems. CMAA-70, Section 5.4.6 provides substantial guidance for the use of static control systems. EOCI-61 provides guidance for magnetic control systems only. This variation is not expected to be of consequence because magnetic control systems were generally employed in cranes designed when EOCI-61 was in effect and the static control requirements identified in CMAA-70 constitute a codification of the same good engineering practice that would have been used in the design of static control systems in cranes built to EOCI-61 specifications.

14. Restart protection. CMAA-70, Section 5.6.2 requires that cranes not equipped with spring return controllers or momentary contact push buttons be provided with a device that will disconnect all motors upon power failure and will not permit any motor to be restarted until the controller handle is brought to the OFF position. No similar guidance is provided in EOCI-61. This variation is not expected to be of consequence for cranes subject to this review since they are generally designed with spring-return controllers or momentary-contact push buttons.

c. Conclusion

Turkey Point Units 3 and 4 substantially comply with Guideline 7 on the basis of compliance with EOCI-61 requirements. However, insufficient information has been made available to verify that the following CMAA-70 requirements have been satisfied for overhead electrical travelling cranes subject to this review. The Licensee should make this information available or provide suitable justification for concluding that the requirements of CMAA-70 have been satisfied by equivalent means.

1. Hoist lifting speeds do not exceed 30 feet per minute.

2. Nonsymmetrical girder sections were not used in crane construction.

3. Any longitudinal stiffeners in use conform to the requirements of CMAA-70, and allowable h/t ratios in box girders using these stiffeners do not exceed ratios specified in CMAA-70.

4. Girders with b/c ratios in excess of 38 were not used.

5. Fatigue failure was considered in crane design and the number of design loading cycles at or near rated load is less than 20,000 cycles.

6. Maximum crane load weight, plus the weight of the bottom block, divided by the number of parts of rope does not exceed 20% of the manufacturers' published breaking strength.

7. Drum design calculations were based on the combination of crushing and bending loads.

8. Drum groove depth and pitch conform to the recommendations of CMAA-70.

9. Gear horsepower ratings were based on design allowables and calculation methodology equivalent to that incorporated in CMAA-70.

10. A cab-control, cab-on-trolley configuration was not used.

11. Mechanical load brakes or hoist holding brakes with torque ratings of approximately 125% of the hoist motor torque were used.

12. Crane operation under load near the end of bridge or trolley travel is not allowed or is compensated for by bumpers and stops which satisfy the intent of CMAA-70.

13. Any static control systems in use conform to the requirements of CMAA-70.

14. Controllers in use are the spring-return or momentary-contact pushbutton type or are equipped with a device which disconnects all motors on power failure and will not permit restart until the controller handle is brought to the OFF position.

2.2 INTERIM PROTECTION MEASURES

The NRC has established six interim protection measures to be implemented at operating nuclear power plants to provide reasonable assurance that no heavy loads will be handled over the spent fuel pool and that measures exist to reduce the potential for accidental load drops to impact on fuel in the core or spent fuel pool. Four of the six interim measures of the report consist of

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:

1. Heavy load technical specifications

2. 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.

2.2.1 Technical Specifications [Interim Protection Measure 1, NUREG-0612, 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 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. Evaluation

Review of available information indicates that Turkey Point Units 3 and 4 do not have the necessary technical specification. Technical Specification 3.10-2 prohibits movement of the spent fuel cask over the spent fuel pool and further specifies that only one spent fuel assembly may be handled at any one time over the core or the spent fuel pool. However, no specification exists to prohibit movement of routine heavy loads over the spent fuel pool. Therefore, the Licensee should implement a new specification or revise existing specifications to meet the intent of this Interim Protection Measure.

b. Conclusion and Recommendation

Turkey Point Units 3 and 4 do not comply with Interim Protection Measure 1. The Licensee should implement new or revise existing technical specifications to comply with the interim measure.

2.2.2 Administrative Controls [Interim Protection Measures 2, 3, 4, and 5, NUREG-0612, Sections 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]."

a. Summary of Licensee Statements and Conclusions

Summaries of Licensee statements and conclusions are contained in discussions of the respective general guidelines in Sections 2.1.2, 2.1.3, 2.1.4, and 2.1.7.

b. Evaluations, Conclusions, and Recommendations

The evaluations, conclusions, and recommendations are contained in discussions of the respective general guidelines in Sections 2.1.2, 2.1.3, 2.1.4, and 2.1.7.

2.2.3 Special Reviews for Heavy Loads 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 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 and Conclusions

The Licensee has stated that a review of procedures, equipment, and personnel used in load handling operations over the core has been conducted, and that these operations have been addressed in their Administrative Procedure 0736, "Heavy Load Handling."

b. Evaluation and Conclusion

Turkey Point Units 3 and 4 comply with Interim Protection Measure 6.

3. CONCLUSION

This summary is provided to consolidate the results of the evaluation contained in Section 2 concerning individual NRC staff guidelines into an overall evaluation of heavy load handling at Turkey Point Units 3 and 4. Overall conclusions and recommended Licensee actions, where appropriate, are provided with respect to both general provisions for load handling (NUREG-0612, Section 5.1.1) and completion of the staff recommendations for interim protection (NUREG-0612, Section 5.3).

3.1 GENERAL PROVISIONS FOR LOAD HANDLING

The NRC staff has established seven guidelines concerning provisions for handling heavy loads in the area of the reactor vessel, near stored spent fuel, or in other areas where an accidental load drop could damage equipment required for safe shutdown or decay heat removal. The intent of these guidelines is twofold. A plant conforming to these guidelines will have developed and implemented, through procedures and operator training, safe load travel paths such that, to the maximum extent practical, heavy loads are not carried over or near irradiated fuel or safe shutdown equipment. A plant conforming to these guidelines will also have provided sufficient operator training, handling system design, load handling instructions, and equipment inspection to ensure reliable operation of the handling system. As detailed in Section 2, it has been found that load handling operations at Turkey Point Units 3 and 4 can be expected to be conducted in a reliable manner generally consistent with the staff's objectives as expressed in these guidelines.

There are several areas, however, that require additional licensee action to ensure that the overall intent of NUREG-0612 Section 5.1.1 is satisfied.

- FPL should develop and employ safe load paths or load handling corridors within containment that avoid, to the extent practical, the carrying of heavy loads over equipment provided for plant shutdown or decay heat removal.

- FPL should provide suitable visual aids to assist the crane operator and ensure that loads follow designated load paths while remaining outside of exclusion areas. Reasonable alternatives to the floor marking requirement of Guideline 1 should be based on the principle that the operator should not have to rely on memory or the reading of a procedure while operating a loaded crane and moving substantial distance.

- Specify, in crane operating procedures, the specific criteria to be used by supervisors to determine if a pre-shift upper limit switch test is required.

- Develop a program consistent with ANSI N14.6-1976 Section 5.0 to maintain the ensurance of reliability of special lifting devices.

- Complete the assessment of the design of special lifting devices in comparison with sections of ANSI N14.6-1978 affecting device load handling reliability. (This work has been contracted; results are expected by February 1983.)

- Complete the design review of electrical overhead travelling cranes within the scope of NUREG-0612 to determine their equivalence, in matters related to load handling reliability, to cranes designed and fabricated in accordance with CMAA-70. (FPL has agreed to perform this review; the contracted review was expected to commence by November 1982. No estimated completion date was provided by the Licensee.)

3.2 INTERIM PROTECTION

The NRC staff has established certain measures (NUREG-0612, Section 5.3) that 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, Section 5.1 is complete. Specified measures include: the implementation of a technical specification to prohibit the handling of heavy loads over fuel in the storage pool; compliance with Guidelines 1, 2, 3, and 6 of NUREG-0612, Section 5.1.1; a review of load handling procedures and operator training; and a visual inspection program, including component repair or replacement as necessary of cranes, slings, and special lifting devices to eliminate deficiencies that could lead to component failure. Evaluation of information provided by the Licensee indicates that additional Licensee action is required in several areas to comply with these

Interim Protection Measures. Licensee actions for safe load paths and crane operator training have been previously addressed in Section 3.1 of this evaluation. Further Licensee action necessary for compliance includes the following item:

- FPL should implement new or revise existing technical specifications to prohibit movement of any heavy load over irradiated fuel in the spent fuel pool.

4. REFERENCES

1. NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants"
   NRC, July 1980

2. V. Stello, Jr. (NRC)
   Letter to all Licensees
   Subject: Request for Additional Information on Control of Heavy Loads Near Spent Fuel
   NRC, May 17, 1978

3. NRC
   Letter to FPL
   Subject: Request for Review of Heavy Load Handling at St. Lucie Unit 1
   December 22, 1980

4. R. E. Uhrig (FPL)
   Letter to D. G. Eisenhut (NRC)
   Subject: Interim Actions for Control of Heavy Loads
   September 4, 1981

5. R. E. Uhrig (FPL)
   Letter to D. G. Eisenhut (NRC)
   Subject: Control of Heavy Loads
   November 12, 1981

6. R. E. Uhrig (FPL)
   Letter to S. A. Varga
   Subject: Control of Heavy Loads
   Draft Technical Evaluation Report
   August 10, 1982

7. ANSI B30.2-1976
   "Overhead and Gantry Cranes"

8. ANSI N14.6-1978
   "Standard for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials"

9. ANSI B30.9-1971
   "Slings"

10. CMAA-70
    "Specifications for Electric Overhead Traveling Cranes"

ADDITIONAL INFORMATION REQUIRED FROM TURKEY POINT UNITS 3 AND 4

1.a. RECOMMENDATION/OPEN ITEM

Florida Power and Light Company (FPL) should develop and use safe load paths or corridors within containment that avoid, to the extent practical, the movement of heavy loads over equipment provided for plant shutdown or decay heat removal.

b. EVALUATION CRITERIA

The general guidelines of NUREG-0612 require that specific safe load paths be defined to control movement of heavy loads to avoid irradiated fuel and equipment needed for safe shutdown. The intent of this guideline is to identify the best or most preferable load path based upon analysis by engineering staff familiar with overall plant arrangement and then to incorporate these paths into plant procedures and drawings. Formal determination of the load path in this manner would avoid ad hoc load path decisions made on the handling floor by crane operators not familiar with plant equipment or system functions.

c. DISCUSSION

FPL states that safe load paths and restricted zones have been developed which restrict the movement of heavy loads at Turkey Point Units 3 and 4. Certain areas have been established where the handling of loads greater than 1760 lb is restricted; in other areas, the handling of loads greater than 5 tons is restricted on the basis of the structure's ability to withstand a dropped load. The Licensee further states that marking safe load paths is not practical or necessary; sketches are readily available to the operator and serve the same purpose as these markings. A review of the Licensee's response and sketches indicates that areas have been established in which the movement of heavy loads is restricted or excluded; however, specific pathways for the movement of loads, as delineated in NUREG-0612, have not been designated.

The use of exclusion areas is reasonable where the size and number of potentially hazardous impact areas is relatively small compared to the overall coverage of the handling device, such as in the turbine building, the

auxiliary building, and the intake structure. However, even though exclusion areas may be acceptable, the areas should restrict movement of all heavy loads, rather than categorize the loads into different groups, and should take no credit for structural analyses.

Furthermore, inside containment, it is not apparent that all paths in areas other than the restricted areas noted are equally desirable for heavy load movement considering the objective to minimize passage over safe shutdown equipment and to use structural members where feasible. The intent of NUREG-0612 is to provide the crane operator with load paths established on the basis of an engineering review, which avoid important equipment to the extent practical, and which provide fairly detailed directions for load movement by the operators.

2.a. RECOMMENDATION/OPEN ITEM

FPL should provide suitable visual aids to assist the crane operator and ensure that loads follow designated load paths while remaining outside of exclusion areas.

b. EVALUATION CRITERIA

To ensure compliance and avoid unnecessary distractions to crane operators while controlling suspended loads (e.g., trying to reach procedureal steps or drawings with the hook under load), NUREG-0612 requires that safe load paths be marked on the floors. Due to the number of load paths as well as contamination control methods, several licensees have argued against such markings; previously, it has been acceptable to use other appropriate visual aids in lieu of permanent markings to accomplish the same purpose. Such visual aids may consist of tape, pylons, rope, crane benchmarks, or use of a crane supervisor/signalman (with responsibilities delineated in appropriate procedures) to direct the crane operator along the designated load path.

c. DISCUSSION

Visual aids should be provided which identify safe load paths for crane operators so that the operators can concentrate on movement of the load. These visual aids are used to clearly identify those areas where movement of heavy loads will occur. Alternative methods of providing visual aids such as matchmarking the crane, identifying physical boundaries, or the use of dedicated load handling supervisors (with responsibilities clearly defined in appropriate procedures) are possible approaches which provide operator assistance equivalent to floor markings.

3.a. RECOMMENDATION/OPEN ITEM

The Licensee should specify, in crane operating procedures, the specific criteria to be used by supervisors to determine whether a pre-shift upper limit switch test is required.

b. EVALUATION CRITERIA

NUREG-0612 requirements, as stated by criteria contained in ANSI B30.2-1976, specify that "all limit switches should be checked, without a load on the hook, at the beginning of each work shift."

c. DISCUSSION

The Licensee has stated that at shift change, the upper limit device will be tested under "no load" conditions unless a load is hanging from the hook at shift change or unless no crane operation in the area of the upper limit is anticipated.

It is noted that shift testing of only those crane controls necessary for crane operation is satisfactory with the understanding that testing is monitored to ensure proper implementation. Similarly, while it is apparent that upper limit switch testing is inappropriate with an attached load or when lifts at the lower extreme of hook travel are planned, specific definition is required as to when upper limit switch testing is necessary.

4.a. RECOMMENDATION/OPEN ITEM

FPL should assess special lifting devices to determine compliance with the requirements of ANSI N14.6-1978. Such an assessment should include verification of design adequacy, as well as implementation of programs that ensure continuing compliance with the criteria of ANSI N14.6-1978, Section 5.

b. EVALUATION CRITERIA

The general guidelines of NUREG-0612 specify that special lifting devices used to carry heavy loads should satisfy the requirements of ANSI N14.6-1978. In order to determine if the devices are in compliance or whether equivalence with the standard may be established, the licensee, as a minimum, should demonstrate that the following issues have been adequately addressed for each device identified:

- adequacy of design (i.e., stress design factors, quality assurance, fabrication controls)
- proof of workmanship and mechanical integrity (initial load test)
- programs to assure continuing compliance (a test and inspection program which complies with ANSI N14.6-1978, Section 5).

c. DISCUSSION

FPL has stated that the original vendor is reviewing the design of the Turkey Point reactor vessel internals and head lifting rigs, the load cell and load cell linkage, and the reactor coolant pump motor lifting rig to determine the acceptability of these devices. When this review is completed, the Licensee should provide their evaluation regarding compliance for all special lifting devices. In performing this evaluation, the Licensee should address the imposition of static and dynamic loads when assessing design stresses. Further, in addition to determining that special lifting devices have been designed and fabricated in a manner consistent with high reliability, the intent of the NUREG guideline is to make certain that appropriate steps are taken to ensure that these devices are inspected, tested, and maintained so as to ensure continued reliability. Guidance for a program to support this goal is contained in Section 5 of ANSI N14.6-1978. FPL has provided no information addressing these issues.

5.a. RECOMMENDATION/OPEN ITEM

FPL should complete the design review of electrical overhead traveling cranes within the scope of NUREG-0612 to determine their equivalence, in matters related to load handling reliability, to cranes designed and fabricated in accordance with CMAA-70.

b. EVALUATION CRITERIA

The general guidelines of NUREG-0612 require that the design of cranes meet the criteria of ANSI B30.2-1976 and CMAA-70, "Specifications for Overhead Traveling Cranes." Cranes owned by most licensees were built to EOCI-61, the foterunner of CMAA-70. A detailed comparison has been performed to identify differences between CMAA-70 and EOCI-61 which may affect load handling reliability and safety. To demonstrate the equivalence of cranes built to EOCI-61 with the added requirements of CMAA-70, licensees were requested to evaluate compliance with those items identified for their individual cranes.

c. DISCUSSION

FPL states that cranes at Turkey Point were designed to EOCI-61; however, FPL has not addressed the more restrictive design requirements imposed by CMAA-70, which could affect the crane's ability to safely handle a heavy load. Therefore, the Licensee should perform a detailed comparison of those differences previously provided to the Licensee for overhead traveling cranes subject to compliance with NUREG-0612.

6.a. RECOMMENDATION/OPEN ITEM

FPL should implement new, or revise existing, technical specifications to prohibit movement of any heavy loads over irradiated fuel in the spent fuel pool.

b. EVALUATION CRITERIA

Interim protection measures of NUREG-0612 require that licenses of operating reactors without a single-failure-proof overhead crane be revised to include a technical specification which prohibits movement of any heavy load over irradiated fuel in the spent fuel pool.

c. DISCUSSION

Review of available Turkey Point information indicates that the required specification has not been implemented. Technical Specification 3.10-2 prohibits movement of the spent fuel cask over the spent fuel pool but does not address routine heavy loads. Therefore, the Licensee should revise this specification or implement a new technical specification to comply with NUREG-0612.