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May 17, 1988

B. Paul Cotter, Jr., Chairman
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U.S. Nuclear Regulatory
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Washington, D.C. 20555

Glen O. Bright
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. Richard F. Cole
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Re: In the Matter of Florida Power and Light
Company (St. Lucie Plant, Unit No. 1)
Docket No. 50-335-OLA

Dear Members of the Board:

Enclosed, for the information of the Board, is a copy of Amendment No. 30 to Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit No. 2. This amendment permits Unit No. 1 spent fuel to be transferred from the Unit No. 1 spent fuel pool to the Unit No. 2 spent fuel pool up until the time that the Unit No. 1 pool is reracked. The amendment was referenced on page 15 of the Board's Memorandum and Order, dated April 20, 1988, in connection with proffered Contention 4, and was issued May 10, 1988.

Sincerely,

Michael A. Bauser

Michael A. Bauser

MAB:cja

cc: Attached Service List

D503

May 17, 1988

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
FLORIDA POWER AND LIGHT COMPANY	)	Docket No. 50-335-OLA
	)	
(St. Lucie Plant, Unit No. 1)	)	
	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of a Letter to the Members of the Board from Michael A. Bauser, dated May 17, 1988, were served on the following by deposit in the United States mail, first class, postage prepaid and properly addressed, on the date shown below:

B. Paul Cotter, Jr., Chairman
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Glenn O. Bright
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. Richard F. Cole
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Alan S. Rosenthal, Chairman
Atomic Safety and Licensing Appeal Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Atomic Safety and Licensing Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Adjudicatory File
Atomic Safety and Licensing Board Panel Docket
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
(Two Copies)

Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Chief, Docketing and Service Section
(Original plus two copies)

Benjamin H. Vogler, Esq.
Office of General Counsel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Campbell Rich
4626 S.E. Pilot Avenue
Stuart, Florida 34997

Dated this 17th day of May, 1988.

Michael A. Bauser

Michael A. Bauser

Newman & Holtzinger, P.C.
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Washington, D.C. 20036

Telephone: (202) 955-6600

Counsel for
Florida Power & Light Company

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 10, 1988

Docket No. 50-389

Mr. W. F. Conway
Senior Vice President-Nuclear
Florida Power & Light Company
P. O. Box 14000
Juno Beach, Florida 33408

Dear Mr. Conway:

SUBJECT: ST. LUCIE UNIT 2 - ISSUANCE OF AMENDMENT RE: TRANSFER OF SPENT FUEL (TAC NOS. 61938 AND 61939)

The Commission has issued the enclosed Amendment No. 30 to Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit No. 2. This amendment consists of changes to the license in response to your application dated July 2, 1986, as supplemented by letters dated February 6 and 9, March 2 and 27 and April 28, 1987.

This amendment permits Unit No. 1 spent fuel to be transferred from the Unit No. 1 spent fuel pool to the Unit No. 2 spent fuel pool.

Your application proposed a change in the license to permit possession of Unit No. 1 byproduct and special nuclear materials (in the form of Unit No. 1 spent fuel assemblies) at Unit 2. The enclosed amendment reflects your proposed license change. In addition, we have added a license condition that permits the transfer up until the time that the Unit No. 1 spent fuel pool is reracked. This added license condition is based upon our "need" evaluation and is contained in the Environmental Assessment that was forwarded to you by letter dated February 22, 1988. The license condition was discussed with and agreed to by your staff.

Lastly, our review concludes that (1) shipping cask NAC-1 is unsuitable for use in transferring St. Lucie 1 fuel assemblies, (2) shipping cask NLI-1/2 is suitable as long as the initial uranium-235 enrichment is less than or equal to 3.7%, and (3) placement of St. Lucie Unit No. 1 fuel assemblies in either Region I or Region II racks of the St. Lucie Unit No. 2 spent fuel pool is acceptable when the provisions of St. Lucie Unit No. 2 Technical Specification 5.6.1.a.3 are met.

A copy of the Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

E. G. Tourigny, Project Manager
Project Directorate II-2
Division of Reactor Projects-I/II
Office of Nuclear Reactor Regulation

Enclosures
1. Amendment No. 30 to NPF-16
2. Safety Evaluation

cc w/enclosures:
See next page

Mr. W. F. Conway
Florida Power & Light Company

St. Lucie Plant

cc:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FLORIDA POWER & LIGHT COMPANY

ORLANDO UTILITIES COMMISSION OF

THE CITY OF ORLANDO, FLORIDA

AND

FLORIDA MUNICIPAL POWER AGENCY

DOCKET NO. 50-389

ST. LUCIE PLANT UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 30
License No. NPF-16

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Florida Power & Light Company, et al. (the licensee), dated July 2, 1986, as supplemented February 6 and 9, March 2 and 27, and April 28, 1987, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, Facility Operating License No. NPF-16 is amended as follows:

   A. Section 2.B.5 is changed to read:

      5. Pursuant to the Act and 10 CFR Parts 30, 40, and 70, FP&L to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of St. Lucie, Units 1 and 2.

   B. License Condition 2.C(19) is added as follows:

      19. Unit No. 1 spent fuel may be transferred from the Unit No. 1 spent fuel pool to the Unit No. 2 spent fuel pool, as necessary, until completion of all activities related to the increase in capacity of the Unit No. 1 spent fuel pool to 1706 spent fuel assemblies. Spent fuel assemblies transferred from the Unit 1 spent fuel pool to the Unit 2 spent fuel pool may remain in the Unit 2 spent fuel pool or be transferred back to the Unit 1 spent fuel pool.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects-I/II
Office of Nuclear Reactor Regulation

Date Of Issuance: May 10, 1988

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO THE TRANSFER OF UNIT NO. 1 SPENT FUEL

BETWEEN UNIT NO. 1 AND UNIT NO. 2 OF THE ST. LUCIE PLANT

RELATING TO AMENDMENT NO. 30

TO FACILITY OPERATING LICENSE NO. NPF-16

FLORIDA POWER & LIGHT COMPANY, ET AL.

ST. LUCIE PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-335 AND 50-389

Table of Contents

1.0 INTRODUCTION

By letter dated July 2, 1986, Florida Power and Light Company (FP&L, the licensee) requested approval to transfer spent fuel from the Unit 1 spent fuel pool to the Unit 2 spent fuel pool. Additional information was submitted by letters dated February 6 and 9, 1987, March 2 and 27, 1987, and April 28, 1987 and in telecons on February 19 and 23, 1987 in response to staff requests.

Facility Operating License No. DPR-67 for the St. Lucie Plant, Unit 1, currently permits storage of Unit 1 spent fuel in the Unit 1 spent fuel pool located in Fuel Handling Building Number 1. Similarly, Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit 2, currently permits storage of Unit 2 spent fuel in the Unit 2 spent fuel pool located in Fuel Handling Building Number 2. The Unit 1 spent fuel pool has a maximum capacity of 728 fuel assemblies. As a result of the Unit 1 refueling outage which ended in April 1987, there is no longer enough storage space in the pool to completely off-load the Unit 1 reactor core. The next Unit 1 refueling outage is scheduled for the summer of 1988. Additional spent fuel assemblies will be added to the pool at that time, compounding the problem. By letter dated June 12, 1987, the licensee proposed a license amendment to rerack the Unit 1 spent fuel pool, which would significantly increase the storage capacity of the pool. The reracking was authorized on March 11, 1988; it will take several months to complete. The completion of reracking of the spent fuel pool will obviate the need to transfer Unit 1 fuel to the Unit 2 spent fuel pool. However, as described above and in the staff's Environmental Assessment issued on February 22, 1988, spent fuel will have to be transferred if the rerack cannot be completed over the next few months.

The Unit 2 spent fuel pool has a maximum licensed capacity of 1076 fuel assemblies. Since Unit 2 was licensed in 1983 and is currently in its fourth operational cycle, there is a considerable amount of excess capacity in the Unit 2 spent fuel pool at this time.

The Fuel Handling Buildings are approximately 300 feet apart. The spent fuel pools do not communicate with each other. In order to store Unit 1 spent fuel in the Unit 2 spent fuel pool, a fuel shipping cask would have to be used to transfer the spent fuel between the fuel pools. The licensee plans to use an approved shipping cask to transfer one fuel assembly at a time from Unit 1 to Unit 2.

The licensee does not have the authority to transfer spent fuel between units and store Unit 1 fuel in the Unit 2 spent fuel pool. Thus, the licensee submitted an application for Commission review and approval. The licensee proposed the Unit 2 license be amended as follows: "Pursuant to the Act and 10 CFR Parts 30, 40 and 70, FP&L to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of St. Lucie, Units 1 and 2."

On October 20, 1986, a notice was published in the Federal Register (51 FR 37242), which described the licensee's application for amendment. The notice also stated that any person whose interest might be affected by the proceeding might file a written petition to intervene by November 19, 1986. By letter dated November 6, 1986, Mr. John Paskavitch requested a hearing on the licensee's application. An Atomic Safety and Licensing Board was subsequently convened. The staff's discussion related to this matter is part of the following safety evaluation (Section 3.0).

Mr. Paskavitch's hearing request was dismissed by the ASLB in a Memorandum and Order dated January 16, 1987. 25 NRC 32. See discussion in a 3.0 infra.

In a separate but related matter, the Board wrote a letter of concern to the Counsels for the NRC staff and licensee dated December 9, 1986. The letter raised a concern in regard to General Design Criterion (GDC) 5, Appendix A, 10 CFR Part 50. GDC 5 states the following:

> Sharing of Structures, Systems, and Components. Structures, systems, and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units.

The licensee addressed the Board's concern in a letter dated February 6, 1987. This letter is considered by the staff to be part of the amendment application. The staff's discussion related to the Board's concern is part of the following safety evaluation (Section 2.10).

The following contains the staff's evaluation of the licensee's request for amendment. The licensee determined that the only change needed was an authorization in the license itself to allow Unit 1 spent fuel to be possessed at Unit 2.

2.0 EVALUATION

2.1 Criticality

The two areas of the criticality aspects of transferring fuel from the St. Lucie Unit 1 spent fuel pool to the St. Lucie Unit 2 spent fuel pool that require evaluation are: (1) the removal of fuel from the St. Lucie Unit 1 spent fuel pool and its placement in a shipping cask, and (2) the placement of St. Lucie Unit 1 spent fuel assemblies in the St. Lucie Unit 2 spent fuel pool.

By letter dated February 9, 1987, the licensee stated that shipping cask Model Nos. NAC-1 and NLI-1/2 are the only casks that meet the 25 ton Technical Specification 3.9.13 limit for the St. Lucie Unit 1 cask crane. These two casks can each hold only one PWR fuel assembly. However, shipping cask NAC-1 is currently approved for use with natural uranium fuel only. The Certificate of Compliance No. 9183, Revision No. 4 dated July 30, 1986, also imposes other restrictions on the radioactive material that may be transported in shipping cask NAC-1. The PWR fuel assemblies stored in the St. Lucie Unit 1 spent fuel pool do not meet the limitations imposed on the shipping cask. Therefore, the staff concludes that shipping cask NAC-1 is not acceptable for the purpose of transporting spent fuel assemblies from the St. Lucie Urit 1 spent fuel pool to the St. Lucie Unit 2 spent fuel pool.

Shipping cask NLI-1/2 has been approved for the shipment of a PWR fuel assembly whose average initial enrichment is no greater than 3.7 weight percent uranium-235. Other restrictions are noted in Certificate of Compliance No. 9010, Revision 17, dated August 28, 1986. Technical Specification 5.6.1.a.3 permits the storage of fuel assemblies in the St. Lucie Unit 1 spent fuel pool whose average initial enrichment can be up to 4.0 weight percent uranium-235.

Therefore, the licensee will need to develop procedural controls for the transfer of fuel assemblies from the St. Lucie Unit 1 spent fuel pool to a shipping cask so that the enrichment limit, in particular, and other limits, in general, for shipping cask NLI-1/2 are met. On the basis of appropriate procedural controls for the transfer of fuel assemblies from the St. Lucie Unit 1 spent fuel pool to shipping cask NLI-1/2, the staff concludes that the criticality aspects of this shipping cask, with one St. Lucie Unit 1 spent fuel assembly having an average initial enrichment of less than or equal to 3.7 weight percent uranium-235, are acceptable.

The staff's Safety Evaluation Report dated October 16, 1984 on the St. Lucie Unit 2 spent fuel pool states that Combustion Engineering (CE) 14x14 fuel assembly designs with uranium-235 enrichment up to 4.5 weight percent may be stored in the Region I racks. The evaluation further states that Region II racks can be used to store fuel which has experienced sufficient burnup such that storage in Region I racks is not required. The Advanced Nuclear Fuels Corporation (ANFC), formerly the EXXON Nuclear Company, 14x14 fuel assembly design for St. Lucie Unit 1 is mechanically, thermal-hydraulically, and neutronically similar to the CE 14x14 fuel assembly design. Both the CE and ANFC fuel assemblies have uranium-235 enrichment of less than or equal to 4.0 weight percent uranium-235. Therefore, the staff concludes that the transfer of St. Lucie Unit 1 fuel assemblies from the shipping cask to the St. Lucie Unit 2 spent fuel pool is acceptable with regard to criticality limitations as follows: (1) the fuel assemblies may be placed in the Region I rack without further consideration, or (2) the fuel assemblies may be placed in the Region II racks provided that the initial uranium-235 enrichment and the assembly burnup meet the enrichments of St. Lucie Unit 2 Technical Specification 5.6.1.a.3.

As discussed above, the staff has made the following conclusions concerning the criticality aspects of transferring fuel assemblies from the St. Lucie Unit 1 spent fuel pool to the St. Lucie Unit 2 spent fuel pool:

(1) Shipping cask NAC-1 is not acceptable for shipping St. Lucie Unit 1 fuel assemblies.

(2) Shipping cask NLI-1/2 is acceptable for shipping St. Lucie Unit 1 fuel assemblies with initial uranium-235 enrichment less than or equal to 3.7% weight percent.

(3) The placement of St. Lucie Unit 1 fuel assemblies in the St. Lucie Unit 2 spent fuel pool Region I racks is acceptable; placement in Region II racks is acceptable when the provisions of St. Lucie Unit 2 TS 5.6.1.a.3 are met.

2.2 Spent Fuel Assembly Storage Arrangements

The St. Lucie Unit 1 spent fuel pool currently contains a mixture of CE and ANFC fuel. The use of ANFC fuel at St. Lucie 1 was approved by the staff in a letter dated March 1, 1984. St. Lucie Unit 2 has used only CE fuel during its first two cycles of operation. In a letter dated March 13, 1984, the licensee stated that the Unit 2 spent fuel racks are designed to accommodate storage of Unit 1 fuel. These racks were approved by the staff in a letter dated October 16, 1984.

In a letter dated February 9, 1987, the licensee provided the following additional information regarding the spent fuel transfer:

a. The initial batch of Unit 1 spent fuel assemblies to be transferred to the Unit 2 spent fuel pool would be that batch offloaded during the first refueling outage (April-May 1978).

b. It is expected that only 15 to 25 spent fuel assemblies would be subject to transfer to Unit 2 should a Unit 1 full core off-load be necessary.

c. The Unit 1 spent fuel assemblies would be put into the Unit 2 rack positions closest to the cask laydown area in order to be consistent with Unit 2 Technical Specification (TS) 5.6.1.

d. The shipping cask to be used to transfer Unit 1 spent fuel assemblies will meet the 25 ton limit per TS 3.9.13 for the Unit 1 cask crane.

e. Transfer of Unit 1 spent fuel back to Unit 1 will follow the identical path from Unit 2.

The staff concludes that the spent fuel assembly storage arrangements described above are acceptable. It should be noted that the licensee's statement, that only 15 to 25 spent fuel assemblies would be subject to transfer, assumes that the transfer takes place before the 1988 refueling outage and that the spent fuel pool is not reracked before that time. Considering the possibility that the pool will not be reracked in 1988, the staff, in its Environmental Assessment, used an upper limit of 100 spent fuel assemblies to be transferred in evaluating occupational dose.

2.3 Cask Movement and Path of Travel Inside Units 1 and 2

Unit 1 spent fuel assemblies will be transferred into the Unit 2 spent fuel pool in a fuel shipping cask having a nominal weight of 25 tons or less when fully loaded. This conforms with Unit 1 TS 3.9.13, which limits the load that may be handled by the spent fuel cask crane to a maximum of 25 tons. The corresponding limit for the Unit 2 crane (Unit 2 TS 3.9.12) is 100 tons. Loads in excess of 2,000 pounds are prohibited from travel over irradiated fuel in the Unit 1 spent fuel pool per Unit 1 TS 3.9.7. A corresponding load limit for Unit 2 of 1600 pounds is indicated in Unit 2 TS 3.9.7. A Unit 1 spent fuel assembly weighs less than 1,300 pounds (less than the above TS limit for either unit), and therefore, Unit 1 spent fuel assembly travel over either spent fuel pool is acceptable.

Crane and cask movement arrangements are described in Section 9.1 of the Unit 1 and Unit 2 Final Safety Analysis Reports (FSARs). The staff previously concluded that St. Lucie Units 1 and 2 are in conformance with the heavy loads handling criteria of NUREG-0612 "Control of Heavy Loads at Nuclear Power Plants," Sections 5.1.1 and 5.3 by letters dated March 4, 1985 (St. Lucie Unit 1) and April 2, 1985 (St. Lucie Unit 2). This review included movement of a 25-ton cask within the Units 1 and 2 buildings, and thus a further review in this regard is unnecessary. Thus, the staff concludes that the cask movements and path of travel inside the buildings of both units are acceptable for the proposed transfer of Unit 1 spent fuel to Unit 2.

2.4 Cask Movement and Path of Travel Outside Units 1 and 2

In their submittals dated February 9, 1987 and March 2, 1987, the licensee stated that an evaluation had been performed for a spent fuel trans-shipment utilizing a 25-ton cask along a path starting at the Unit 1 cask loading area and traveling to the Unit 2 cask loading area. This path coincides with a portion of the intermodal cask transporter path previously evaluated for effects upon underground structures and utilities. The spent fuel trans-shipment path road surface is paved with Portland cement concrete or asphaltic concrete. Two transport vehicles were considered in the evaluation. The reactions of the two transport vehicles were compared to the maximum reactions of the intermodal cask transporter that was previously evaluated. Since the reactions of the intermodal cask transporter were greater than the reaction for either of the two transport vehicles, the intermodal cask transporter evaluation is considered to be an enveloping evaluation. The stress analysis which was performed indicated that safety-related (Category 1) components located beneath the path of travel, including missile protection slabs, underground facilities (pipes and conduits), manholes and manhole covers, have the capability to withstand the prescribed sustained and live loads with an acceptable margin of safety.

The licensee also indicated that to reduce the likelihood of a cask drop accident, the roadway will be inspected for general deterioration so that it can be repaired, if necessary, prior to the transport of spent fuel. The shipping cask will also be adequately secured to the transport vehicle. To further reduce the possibility of a cask drop, the following additional features are provided:

a. Conservative design margins in the lifting components.

b. Redundant braking systems for hoists.

c. Periodic tests and inspections of the cranes.

d. Use of qualified crane operators and riggers.

e. Use of specific operating and administrative procedures.

The licensee's evaluation concerning the structural integrity of the spent fuel trans-shipment path has also been reviewed by the staff and is addressed in Section 2.9 of this safety evaluation. The licensee has also evaluated the

potential radiological effects of a cask drop outside the fuel handling building in the Unit 1 FSAR, Section 9.1.4. The staff evaluation of this issue is contained in Section 2.8. Thus, the staff concludes that the cask movement and path of travel outside Units 1 and 2 are in accordance with staff guidelines and are, therefore, acceptable.

2.5 Integrity of Spent Fuel Storage Pool Cooling

The ability of the spent fuel storage pool to maintain an adequate water level following damage to the pool floor resulting from a postulated free fall drop of a fuel shipping cask was considered by the licensee in the St. Lucie Units 1 and 2 FSARs. The licensee stated the following in their submittal dated February 9, 1987:

"a. For both Units 1 and 2, the cask is physically prevented and administratively prohibited from traveling over the spent fuel pool outside the cask storage area.

b. Section 9.1.4.3 of the Unit 1 FSAR postulates two cask drop accidents for the Unit 1 spent fuel pool, a vertical and tipped cask drop. The vertical cask drop into the cask storage area has been analyzed to determined if the leak-tight barrier of the pool can be breached. The results of the analysis indicate that the leak-tight integrity is maintained for a 25 ton cask drop. Technical Specification 3/4.9.13, "Spent Fuel Cask Crane," provides assurance that the Unit 1 fuel cask crane does not handle loads in excess of 25 tons. A tipped cask drop has also been considered and the analysis results found to be acceptable.

c. A concrete wall to the top of the Unit 1 spent fuel pool separates the cask storage area from the spent fuel storage area. The wall prevents a water level reduction over the spent fuel assemblies even if a dropped fuel cask causes damage to the pool or pool liner in the cask storage area.

d. Unit 1 spent fuel assemblies would be transferred to Unit 2 spent fuel pool rack positions in conformance with Unit 2 TS 5.6.1."

The staff previously concluded in Supplement No. 2 to the St. Lucie Unit 1 SER dated March 1, 1976, that the cask drop accident for a cask not exceeding 25 tons will not result in a breach of the leak-tight integrity of the fuel pool, and a 25-ton single element spent fuel cask drop anywhere along its travel path will not result in unacceptable release of radioactivity or damage to safety-related equipment. Further, the staff evaluation concerning the St. Lucie Unit 1 spent fuel pool reracking (Amendment No. 22) dated March 29, 1978 stated that the consequences of fuel handling accidents in the spent fuel pool are not changed from those presented in the earlier safety evaluation, and are acceptable. Thus, the staff evaluations for St. Lucie Unit 1 dated March 29, 1978 (Amendment No. 22), May 8, 1975 (Supplement 1 to SER) and November 8, 1974 (original SER), which found the spent fuel cooling system to be acceptable, are still valid. The staff acceptance of the St. Lucie Unit 2 spent fuel pool cooling and spent fuel handling systems is contained in the evaluations dated October 1981 (original SER), April 1983 (Supplement 3 to SER) and October 16, 1984 (Amendment No. 7). Thus, the staff concludes that the integrity of spent fuel pool cooling capability will be maintained during the spent fuel transfer.

2.6 Integrity of Critical Safety Systems and Equipment

As noted previously, the staff concluded in Supplement No. 2 to the St. Lucie Unit 1 SER dated March 1, 1976 that "a 25-ton single element spent fuel cask drop can be tolerated anywhere along its travel path without resulting in an unacceptable release of radioactive or damage to safety-related equipment. Since a cask drop accident can be tolerated without unacceptable consequences, the applicant's approach to cask drop protection is, therefore, acceptable." In addition, the staff subsequently concluded in its evaluation dated March 29, 1978 concerning the reracking of St. Lucie Unit 1 that the above conclusion remains unchanged.

The staff SER dated October 1981 for initial licensing of St. Lucie Unit 2 stated that "the cask travel within the fuel handling building is limited to the opening in the building roof through which the hoist cables must pass, thus preventing cask travel over any portion of the spent fuel pool and over any safety-related equipment. A cask drop is very unlikely due to the cask crane design features such as upper hoisting limit switches, dual stopping and event of a cask drop, the cask would fall into the cask pool which could damage the floor of the cask pool but would not damage the spent fuel pool and therefore, the requirements of General Design Criterion 61, 'Fuel Storage and Handling and Radioactivity Control,' and the guidelines of Regulatory Guide 1.13, 'Spent Fuel Storage Facility Design Basis,' are satisfied for handling of the spent fuel cask." The staff SER dated October 16, 1984 concerning the reracking of the St. Lucie Unit 2 spent fuel pool stated that this conclusion remains unchanged.

As mentioned in Section 2.4, the staff evaluation of the integrity of safety-related components buried under the cask path of travel between Units 1 and 2 is addressed elsewhere (Section 2.9). Thus, the staff concludes that the integrity of critical safety systems and equipment is not compromised for the proposed spent fuel transfer.

2.7 Occupational Radiation Exposure

The staff has reviewed the licensee's plan to transfer spent fuel assemblies between Units 1 and 2 with respect to occupational radiation exposure and concludes that design and operational considerations are in accordance with the ALARA policy. This conclusion is based on the licensee having considered the requirements of 10 CFR 20.101 and 20.103, and the guidelines of Regulatory Guides 8.8 and 8.10. The occupational exposure for the spent fuel transfer operation is estimated by the licensee to be less than 0.4 person-rem per spent fuel assembly. This estimate is based on the licensee's detailed breakdown of occupational exposure for each phase of the transfer. The licensee considered the number of individuals performing a specific job, their occupancy time while performing this job, and the average dose rate in the area where the job is being performed. The spent fuel assemblies themselves contribute a negligible dose rate in the spent fuel pool area because of the depth of water in the spent fuel pool. One potential source of radiation is radioactive activation of corrosion products, called crud. Crud may be released to the spent fuel pool water because of fuel movement during the spent fuel assemblies' transfer. This could increase radiation levels in the vicinity of both spent fuel pools. The licensee expects that crud of the spent fuel pool walls for either unit will not present a significant contribution to exposure. Further, the spent fuel pool cleanup system will remove deposits in the spent fuel pool water and thereby reduce crud levels.

During the spent fuel assembly transfer, occupational exposure will be limited by the existing ALARA procedures and guidelines. The staff previously reviewed these ALARA procedures as part of its evaluation for the St. Lucie Unit 1 license extension and concluded that these procedures as described in the updated FSAR (radiation protection plans) are in accordance with 10 CFR Part 20 and are consistent with the criteria of Regulatory Guide 8.8.

The licensee also plans to use operating experience gained from previous spent fuel assembly transfers at Turkey Point Units 3 and 4 to further minimize collective doses to workers. Further, NRC inspectors will monitor implementation of the procedures, surveillance and radiation protection program (conference call with Region II on May 7, 1987). Therefore, the staff concludes that the radiation protection program is adequate for ensuring that occupational radiation exposure during the spent fuel transfer will be maintained in accordance with ALARA guidelines, including Regulatory Guide 8.8, and the requirements of 10 CFR Part 20.

2.8 Radiological Accident Analysis Evaluation

The staff has reviewed the potential consequences of three postulated design basis accidents which involve spent fuel as part of the review of the acceptability of the licensee's request to transport spent fuel from the St. Lucie Unit 1 spent fuel pool (SFP) to that of St. Lucie Unit 2. These accidents are the fuel handling, cask drop, and cask transport accidents. The radiological consequences of these accidents were previously analyzed by the staff and reported in SERs dated November 8, 1974, March 1, 1976, and March 29, 1978 for St. Lucie Unit 1, and October 1981 and October 16, 1984 for Unit 2. The previous fuel handling and cask drop accidents do not require reevaluation because the operations potentially involved with these accidents are not modified by the proposed license amendment. The cask transport accident previously involved the transport of 10 spent fuel assemblies following a 90 day cooldown period. The proposed license amendment would permit only the transport of a single fuel assembly which could occur at the earliest with a 1490 hour cooldown (according to TS 3/4.9.14, the earliest decay time of spent fuel, before a shipping cask would be allowed into the cask compartment in the area of the SFP with greater than a third of the core in storage, is 1490 hours).

The staff has reevaluated the consequences of the single fuel assembly cask transport accident. The accident assumptions are tabulated in Table 1. The calculated thyroid doses at the exclusion area and low population zone boundary were 18.4 and 7.2 rem, respectively. The whole body doses at both locations were less than 0.1 rem. These calculated doses are well below the guideline values stated in 10 CFR Part 100, i.e., 300 rem to the thyroid and 25 rem to the whole body. Thus, the staff concludes that the consequences of postulated design basis accidents for the spent fuel transfer are acceptable.

Table 1 - Assumptions Used In The Fuel Transport Accident Analysis

Power Level	2754 Mwt
Number of Fuel Rods Damaged	236
Total Number of Fuel Rods in Core	51,212
Radiation Peaking Factor of Damaged Rods	1.65
Shutdown Time	1490 hours
Inventory Released from Damaged Rods	10% (iodines)
	10% (noble gases other than Kr-85)
	30% (Kr-85)
Atmospheric Diffusion Factors (seconds per cubic meter)	
0-2 hour X/Q Value at 1560 meters	1.6 E-4
0-8 hour X/Q Value at 1610 meters	6.3 E-5

2.9 Spent Fuel Handling and Load Path Structural Integrity

The following evaluation addresses spent fuel handling and load path structural integrity. Franklin Research Center (FRC) assisted the staff in its review and prepared a Technical Evaluation Report (TER) in support of the staff's evaluation. The TER is attached and is considered a part of this safety evaluation.

The licensee's July 2, 1986 submittal stated that the proposed license amendment does not alter the type or amount of reactor fuel which can be received, used, and possessed at the site for operation of St. Lucie Units 1 and 2. In the proposed license amendment for fuel pool reracking, dated March 13, 1984, it was stated that the St. Lucie Unit 2 spent fuel racks would be designed to accommodate the storage of Unit 1 fuel assemblies. The St. Lucie Unit 2 racks were approved by the NRC on October 16, 1984 (Amendment No. 7). Therefore, storage of St. Lucie Unit 1 spent fuel in the Unit 2 racks is acceptable.

The licensee's July 2, 1986 submittal also stated that spent fuel from St. Lucie Unit 1 will be transferred to Unit 2 in a fuel shipping cask having a nominal weight of 25 tons or less when loaded. This statement conforms with Unit 1 TS 3.9.13, which limits the load that may be handled by the spent fuel cask crane to a maximum of 25 tons. The corresponding limit for the Unit 2 spent fuel cask crane is 100 tons (Unit 2 TS 3.9.12). Thus, the spent fuel cask cranes of both units are capable of handling the spent fuel transfer load safely.

The method of handling of St. Lucie Unit 1 spent fuel assemblies during the transfer from Unit 1 to Unit 2 is described in the licensee's letter of March 2, 1987. FRC has evaluated the method and concluded that the method is adequate.

There are two possible cask transporter vehicles to be used for the proposed spent fuel transport between St. Lucie Units 1 and 2: the Rogers Vehicle (RV) and the other vehicle (O). The transport vehicle is only allowed to cross a designated path. The path affects a roadway, missile protection slabs, and underground facilities (i.e., pipes, electric conduit, manholes, and catch basins), all of which were originally designed for the load of an intermodal cask transporter. Wheel arrangements and the weight of the two cask transporters (RV and O) proposed to be used and of the original intermodal transporter were provided by the licensee. The information provided was sufficient to evaluate the safety of structures that would be affected by the loads of the transporter vehicles. The licensee reported that the stress analysis results indicated that all Category I structural components within the load path of the transporter vehicles have the capability to withstand prescribed loads for the intermodal cask transporters with an acceptable margin of safety and for the RV and O transporters with an even higher margin of safety than that of the intermodal transporter. The weight and wheel arrangements were reviewed and evaluated by FRC, which concluded that the RV and O transporters, which were proposed to be used, would produce less stress for the Category I structures than would the intermodal transporter, which was used originally for the design of Category I structures. Therefore, the roadway, missile protection slabs, and underground facilities (i.e., pipes, electric conduit, manholes, and catch basins) all have the capability to withstand the loads of transport vehicles that would cross over them.

The licensee's July 2, 1986 submittal stated that the proposed amendment will not significantly increase the probability or consequences of an accident previously evaluated since the configuration and operation of the plant remain essentially the same. What is not the same is that only a certain number of Unit 1 spent fuel assemblies may be transferred to the Unit 2 spent fuel pool. The Unit 1 assemblies that may be transferred have essentially the same mechanical design, enrichments, and burnup histories as those of the Unit 2 fuel assemblies evaluated and stipulated in the Unit 2 FSAR. Furthermore, the Unit 2 spent fuel racks were designed to accommodate the storage of the Unit 1 fuel. Since the previously approved designs of the two pools and the associated operating and accident analysis assumptions have not been changed, the NRC and its consultant, FRC, agree with the licensee that the proposed amendment will not significantly increase the probability or consequences of an accident previously evaluated.

The licensee's July 2, 1986 submittal also stated that the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated since the change does not modify the configuration or operation of the plant. It also stated that a spent fuel shipping cask that meets the packaging and transportation requirements of 10 CFR Part 71 will be used to transfer spent fuel assemblies, and potential fuel handling and cask drop accidents were evaluated in the FSARs of both units, including the potential drop of a cask outside the fuel handling building. Since the accidents of load handling and transport of the spent fuel have been evaluated and accepted by the previous accident analyses, the NRC and its consultant, FRC, agree with the licensee that the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated and will not involve a significant reduction in the margin of safety of the plant.

Based on the review of the submittals by the licensee and of the TER by FRC, the staff has concluded that (1) the handling of spent fuel assemblies that has been proposed by the licensee is adequate, and (2) the load path proposed in the license amendment for transporting spent fuel assemblies from Unit 1 to Unit 2 has been found safe.

2.10 General Design Criterion 5 Concern - Sharing of Structures, Systems, and Components

By letter dated December 9, 1986, the Atomic Safety and Licensing Board raised a concern in regard to the General Design Criterion (GDC) 5. The Board noted that the staff's October 1981 Safety Evaluation Report (SER) for St. Lucie Plant, Unit 1 (NUREG-0843) stated that, because there was (at the time) no sharing of spent fuel facilities between the two St. Lucie Units, the requirements of General Design Criterion (GDC) 5 were not applicable. The Board also stated that it appeared that GDC 5 would become applicable if the proposed amendment were to be approved.

By letter dated February 6, 1987, the licensee addressed the Board's concern. The licensee stated that GDC 5 only applies to situations in which a single structure, system, or component performs a safety function for more than one unit. In general, the purpose of GDC 5 is to assure that an accident at one unit will not significantly impair the ability of the structure, system, or component to perform its safety function for the other unit. The licensee further stated that GDC 5 does not apply in situations in which a structure, system, or component is not being "shared" by more than one unit; i.e., where a structure, system, or component is not designed to perform a safety function for more than one unit at the same time. Thus, St. Lucie Units 1 and 2 will not share any structure, system, or component which performs a safety function associated with storage of spent fuel at St. Lucie. Lastly, the licensee stated that GDC 5 does not apply to the St. Lucie spent fuel transfer amendment, and the statement contained in the staff's SER of October 1981 will remain valid after issuance of the amendment.

The staff has reviewed the licensee's discussion above regarding the applicability of GDC 5 to the proposed transfer of Unit 1 spent fuel to the Unit 2 spent fuel pool. The staff cannot agree with the licensee that GDC 5 is not applicable for this practice because the Unit 2 spent fuel pool will now be shared for the purpose of storing spent fuel which is a safety function from the standpoint of protection against unacceptable radiological releases. However, the staff concludes from the review of the licensee's information that such sharing will not adversely affect the ability of the Unit 2 spent fuel pool to perform its function since adequate storage and cooling are provided for both Unit 1 and Unit 2 spent fuel. Therefore, the staff concludes that the requirements GDC 5 are met.

2.11 Findings

The staff has concluded that the transfer of Unit 1 spent fuel between the St. Lucie Unit 1 and 2 spent fuel pools is acceptable subject to the following conditions:

(1) Shipping cask NAC-1 is not acceptable for shipping St. Lucie Unit 1 fuel assemblies,

(2) Shipping cask NLI-1/2 is acceptable for shipping St. Lucie Unit 1 fuel assemblies as long as the initial uranium-235 enrichment is less than or equal to 3.7 weight percent,

(3) The placement of St. Lucie Unit 1 fuel assemblies in St. Lucie Unit 2 spent fuel pool Region I racks is acceptable; placement in Region II racks is acceptable when the provisions of St. Lucie Unit 2 TS 5.6.1.a.3 are met, and

(4) Based on need, as described in the introduction section of the evaluation, Unit 1 fuel may be transferred from the Unit 1 spent fuel pool to the Unit 2 spent fuel pool until such time that the Unit 1 spent fuel pool is reracked.

3.0 PUBLIC COMMENTS

On October 20, 1986, a notice was published in the Federal Register (51 FR 37242), which described the licensee's application for amendment. The staff proposed that the application did not involve a significant hazards consideration. The notice also stated that any person whose interest might be affected by the proceeding might file a written petition to intervene by November 19, 1986. By letter dated November 6, 1986, Mr. John Paskavitch requested a hearing on the licensee's application. His letter consisted of one sentence which read: "My request is for a hearing in Florida Power and Light's application to move some fuel in the St. Lucie nuclear plant Unit #1 to Unit #II." On November 20, 1986, an Atomic Safety and Licensing Board was established to rule on the request for hearing and to preside over the proceeding in the event that a hearing was ordered. The licensee filed a response dated December 1, 1986, in opposition to the hearing request. The NRC staff filed a response on December 8, 1986, also opposing the hearing request. By Memorandum and Order dated December 9, 1986, the Board permitted Mr. Paskavitch to file an amended petition by December 24, 1986, setting forth with particularity his interest in the proceeding, how that interest might be affected by the results of the proceeding, and the specific aspect(s) of the proceeding as to which he wished to intervene. On December 10, 1986, Mr. Paskavitch filed a document entitled, "Petitioner's Reasons for a Request for Hearing." Mr. Paskavitch's request included a number of questions regarding the license amendment application. It contained no statement concerning his interest in the proceeding. The licensee and the NRC staff filed responses, dated January 9, 1987 and January 5, 1987, respectively. By Memorandum and Order dated January 16, 1987, 25 NRC 32, the Board dismissed Mr. Paskavitch's hearing request and terminated the proceeding on the basis that Mr. Paskavitch's request failed to satisfy the intervention requirements of 10 CFR 2.714(a).

Even though the only request for hearing was denied and the proceeding was terminated, the staff reviewed Mr. Paskavitch's questions and provides the following responses.

Question 1: "What caused the need to shift spent fuel rods from one pool to another?"

The fuel transfer has not yet taken place, as the transfer requires staff review and approval. One aspect of the staff review and approval is the need to transfer fuel from Unit 1 to Unit 2. This need was addressed in Section II of the staff's Environmental Assessment entitled "Identification of the Proposed Action" and in Section III entitled "Need for the Proposed Action."

Question 2: "How many rods will be relocated?"

The staff reviewed the licensee's application and assumed that for occupational dose calculation purposes, no more than 100 fuel assemblies would be moved from Unit 1 to Unit 2. The details of this evaluation are contained in Section IV.1 of the staff's Environmental Assessment entitled, "Occupational Radiation Exposure." Each fuel assembly contains a maximum of 176 fuel rods, and each assembly will be transferred as a whole.

Question 3: "How many hours will be needed and in what time period to make the shift?"

The staff does not evaluate how many people are needed and in what time period to make the shift. This is a licensee decision. The staff does evaluate the total dose to all personnel involved in the project in order to determine that the transfer meets ALARA dose guidelines. This evaluation is contained in Section IV.1 of the staff's Environmental Assessment entitled "Occupational Radiation Exposure."

Question 4: "What will be the cost of the move?"

The staff does not address cost to the licensee in making its determination as to the acceptability of the transfer. The staff does not know the answer to this question.

Question 5: "What will be the increase in radiation dosing to the workers moving the rods?"

This question was answered in Section IV.1 of the staff's Environmental Assessment entitled "Occupational Radiation Exposure."

Question 6: "What will be the increase in radiation dosing to the people living within 10 miles of the plant?"

This question was answered in Section IV.2 of the staff's Environmental Assessment entitled "Public Radiation Exposure" for a person standing at the site boundary under normal and accident conditions.

Question 7: "If (17 m/r) .017 REM is the allowable dose to the civilian population per year, should pregnant women and children be moved to the evacuation zone, the 10 mile limit during the move?"

No; no offsite actions by citizens are recommended or needed.

Question 8: "Should potassium iodide pills be distributed to all pregnant women and children in case of an accident during the transfer of the fuel rods?"

No; the staff does not see a need for distribution and use of potassium iodide pills.

4.0 ENVIRONMENTAL CONSIDERATION

A Notice of Issuance of Environmental Assessment and Finding of No Significant Impact relating to the proposed transfer of spent fuel from St. Lucie Unit No. 1 to Unit No. 2 was published in the Federal Register on February 26, 1988 (53 FR 5845).

5.0 CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: May 10, 1988

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Attachment:

Technical Evaluation
Report

7.0 REFERENCES

1. FP&L letter No. L-86-250, July 2, 1986 from C. O. Woody (FP&L) to A. C. Thadani (NRC), Subject: Proposed License Amendment, Spent Fuel Transfer.

2. U.S. Nuclear Regulatory Commission, October 16, 1986, from A. C. Thadani (NRC) to C. O. Woody (FP&L), Subject: Notice of Consideration of Issuance of Amendment to Facility Operating License and Proposed No Significant Hazards Consideration and Opportunity for Hearing.

   Also: Federal Register Notice, 51 FR 37242, October 20, 1986.

3. Letter from Mr. J. Paskovitch to Commission, US NRC, November 6, 1986, Subject: Request for Hearing.

4. Letter from Mr. J. Paskovitch to Atomic Safety and Licensing Board, US NRC, December 10, 1986, Subject: Petitioner's Reasons for a Request for Hearing.

5. U.S. Nuclear Regulatory Commission, December 10, 1986, from E. G. Tourigny (NRC) to C. O. Woody (FP&L), Subject: Request for Additional Information.

6. U.S. Nuclear Regulatory Commission, January 23, 1987, from E. G. Tourigny (NRC) to C. O. Woody (FP&L), Subject: Request for Additional Information.

7. FP&L letter No. L-87-49, February 6, 1987 from C. O. Woody (FP&L) to US NRC, Subject: Spent Fuel Transfer - GDC 5 Applicability.

8. FP&L letter No. L-87-48, February 9, 1987 from C. O. Woody (FP&L) to US NRC, Subject: Spent Fuel Transfer.

9. FP&L letter No. L-87-104, March 2, 1987, from C. O. Woody (FP&L) to US NRC, Subject: Spent Fuel Transfer.

10. FP&L letter No. L-87-136, March 27, 1987, from C. O. Woody (FP&L) to US NRC, Subject: Spent Fuel Transfer.

11. U.S. Nuclear Regulatory Commission, March 29, 1987, from E. G. Tourigny (NRC) to C. O. Woody (FP&L), Subject: Request for Additional Information.

12. FP&L letter No. L-87-179, April 28, 1987, from C. O. Woody (FP&L) to US NRC, Subject: Spent Fuel Transfer - Occupational Exposures.

13. U.S. Nuclear Regulatory Commission, February 22, 1988, from H. N. Berkow (NRC) to C. O. Woody (FP&L), Subject: St. Lucie Units 1 and 2 - Environmental Assessment Regarding Transfer of Unit No. 1 Spent Fuel to Unit No. 2.

    Also: Federal Register Notice, 53 FR 5845, February 26, 1988.

14. U.S. Nuclear Regulatory Commission, March 11, 1988, from E. G. Tourigny (NRC) to W. F. Conway (FP&L), Subject: St. Lucie, Unit No. 1 - Issuance of Amendment Re: Spent Fuel Pool Expansion.

TECHNICAL EVALUATION REPORT

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NRC TAC NO. --

NRC CONTRACT NO. NRC-03-81-130

FRC PROJECT C5506

FRC ASSIGNMENT 26

FRC TASK 665

EVALUATION OF PROPOSED LICENSE AMENDMENT
REGARDING SPENT FUEL TRANSFER

FLORIDA POWER AND LIGHT COMPANY
ST. LUCIE GENERATING STATION UNIT 2

TER-C5506-665

Prepared for

Nuclear Regulatory Commission
Washington, D.C. 20555

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JUNE 19, 1987

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Date: 6/19/1987

Approved by: O P Cafagno
Department Director
Date: 6-19-87

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CONTENTS

FOREWORD

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

1. INTRODUCTION

On July 2, 1986, in accordance with the Code of Federal Regulations section 10CFR50.90, Florida Power and Light Company (FPL) submitted a request [1] to amend Facility Operating License NPF-16 of St. Lucie Unit 2. Condition 2.B.5 of the Unit 2 license presently allows FPL to "possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility." The term "facility" refers to the applicable unit. The possession by Unit 2 of byproduct and special nuclear material produced by operation of Unit 1, is, therefore, not specifically addressed in the Unit 2 license at the present time. This proposed license amendment has been submitted by FPL to establish the option of transferring spent fuel from St. Lucie Unit 1 to St. Lucie Unit 2. The Unit 1 spent fuel pool will lose full core reserve capacity as a result of the 1987 refueling outage, and the planned rerack of the spent fuel pool cannot be accomplished prior to 1988. If, in the interim, full core off-load of Unit 1 should be necessary, available storage in the Unit 2 spent fuel pool will be required to store Unit 1 spent fuel assemblies. Details of spent fuel transfer between the two units are discussed in the "Safety Evaluation/No Significant Hazards Consideration" determination attached to the Licensee's request [1].

After a comprehensive structural review and evaluation of the Licensee's request [1], Franklin Research Center (FRC) prepared a request for additional information (RAI), which was submitted to the Licensee through the NRC staff on January 21, 1987 [2]. The Licensee's response was received by the NRC staff on March 2, 1987 [3] and was reviewed promptly by FRC. Some technical issues remained unresolved to the satisfaction of FRC. At the conclusion of a telephone conference call between the NRC, FRC, and FPL staffs, the Licensee agreed and subsequently submitted additional materials [4, 5] that address the unresolved issues. A second telephone conference call between all involved parties followed the review of the latest submittals [4, 5] to clarify the Licensee's response pertinent to some basic assumptions related to the original designs of the missile protection slab and underground facilities.

This report evaluates the structures that would be affected by the changes proposed by the Licensee in its requested amendment to Facility Operating License NPF-16 of St. Lucie Unit 2.

The evaluation is made on the basis of comparing the loads imposed by the transport vehicles on affected Category 1 structures against the corresponding design loads previously approved by the NRC. If the new loads were less than the original design loads, then the new margins of safety of these structures would be higher than those calculated in the original design; consequently, the proposed amendment would pose no threat to the public health and welfare and would not involve a significant hazards consideration.

Conversely, if the new loads were greater than the original design loads, then a new margin of safety would have to be calculated by the Licensee. The new margin of safety would then be compared to the original margin of safety to determine its acceptability.

This evaluation approach assumes that the original design of Category 1 structures affected by this amendment has been adequately checked according to the NRC standards; therefore, the original design calculations were not rechecked.

2. TECHNICAL DISCUSSION OF THE LICENSEE'S SAFETY EVALUATION

2.1 EVALUATION OF THE LICENSEE'S ORIGINAL SUBMITTAL

This section pertains to the technical material presented in the safety evaluation section of the Licensee's "Safety Evaluation/No Significant Hazards Consideration" report attached to the original submittal [1]. Each of the following subsections summarizes the Licensee's findings regarding particular issues and is followed by a technical statement which reflects the FRC evaluation viewpoint.

2.1.1 Comparison of Unit 1 Fuel Assembly Design with That of Unit 2

At the time of issuance of the Licensee submittal [1], St. Lucie Unit 1 was in its seventh cycle of operation (at the current time it is in the eighth cycle of operation). The initial cycle through Cycle 5 used fuel elements manufactured by Combustion Engineering, Inc. (CE). Section 4.2 of the Unit 1 Final Safety Analysis Report (FSAR) describes the mechanical design of Unit 1 fuel manufactured by CE. Fuel elements manufactured by Exxon Nuclear Company, Inc. (ENC), were introduced in Cycle 6; thus, Cycle 6 had, and Cycle 7 has, a mixture of CE and ENC fuel. Cycle 8 is scheduled to operate with ENC fuel only. References 6 and 7 describe the mechanical design of Unit 1 fuel manufactured by ENC. The use of ENC fuel at St. Lucie Unit 1 was approved by the NRC [8]. St. Lucie Unit 2 has completed two cycles of operation. Section 4 2.2 of the Unit 2 FSAR describes the mechanical design of Unit 2 fuel, which is manufactured by CE. Table 2-1 shows the basic mechanical design parameters of Unit 1 and Unit 2 fuel assemblies manufactured by CE, for comparison purposes. Figures 2-1, 2-2, and 2-3 present general configurations and basic dimensions of the fuel assemblies manufactured by CE and ENC for Unit 1, and by CE for Unit 2, respectively.

It should be noted that Table 2-1 which is a reproduction of Table 1 of the original Licensee submittal [1], did not specify whether the mechanical parameters listed under Unit 1 colur belong to the CE or ENC fuel assembly. After comparing the mechanical parameters of the CE fuel assembly presented in Table 4.2-1 of Unit 1 FSAR, it was concluded that the Unit 1 mechanical parameters presented in Table 1 [1] must have been those of the CE fuel assembly. Since Unit 1 is scheduled to operate with ENC fuel only starting

Table 2-1. Comparison of Mechanical Design Parameters of Fuel Assemblies Manufactured by CE for Units 1 and 2

Parameter	Unit 1	Unit 2
Fuel Rod Array (square)	14 x 14	16 x 16
Fuel Rod Pitch (inches)	0.580	0.506
Weight (lb)	1220-1280	1303
Outside Dimensions - Fuel Rod to Fuel Rod (inches)	7.980 x 7.980	7.972 x 7.972

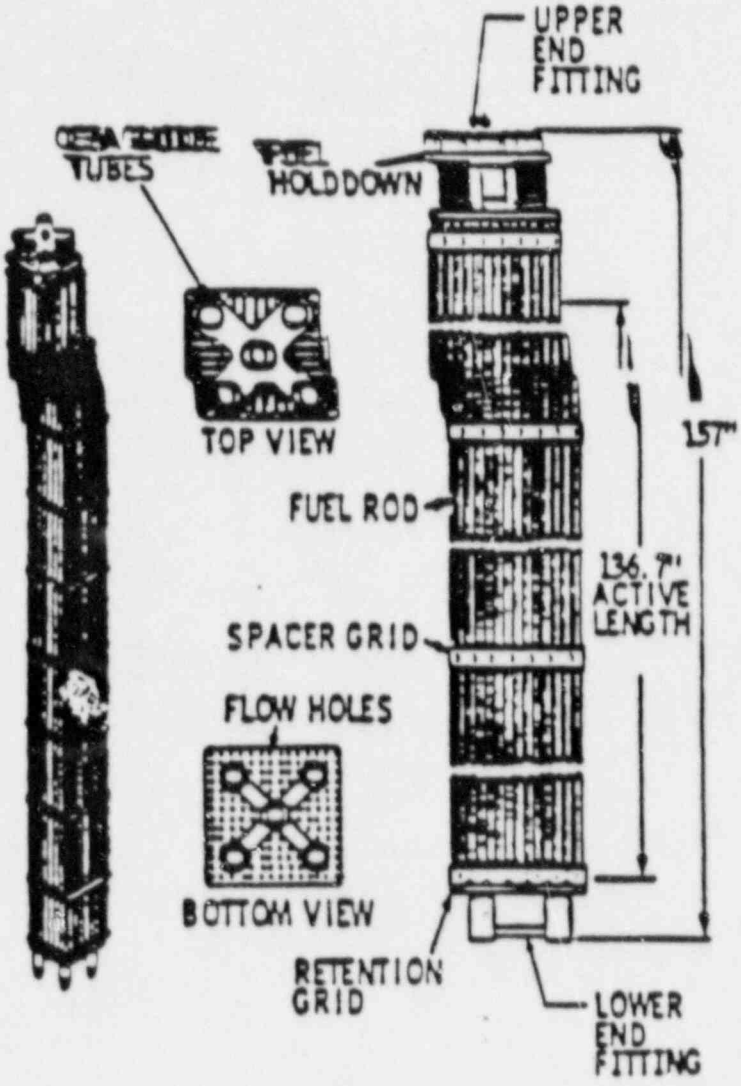


Figure 2-1. Combustion Engineering Fuel Assembly, Unit 1

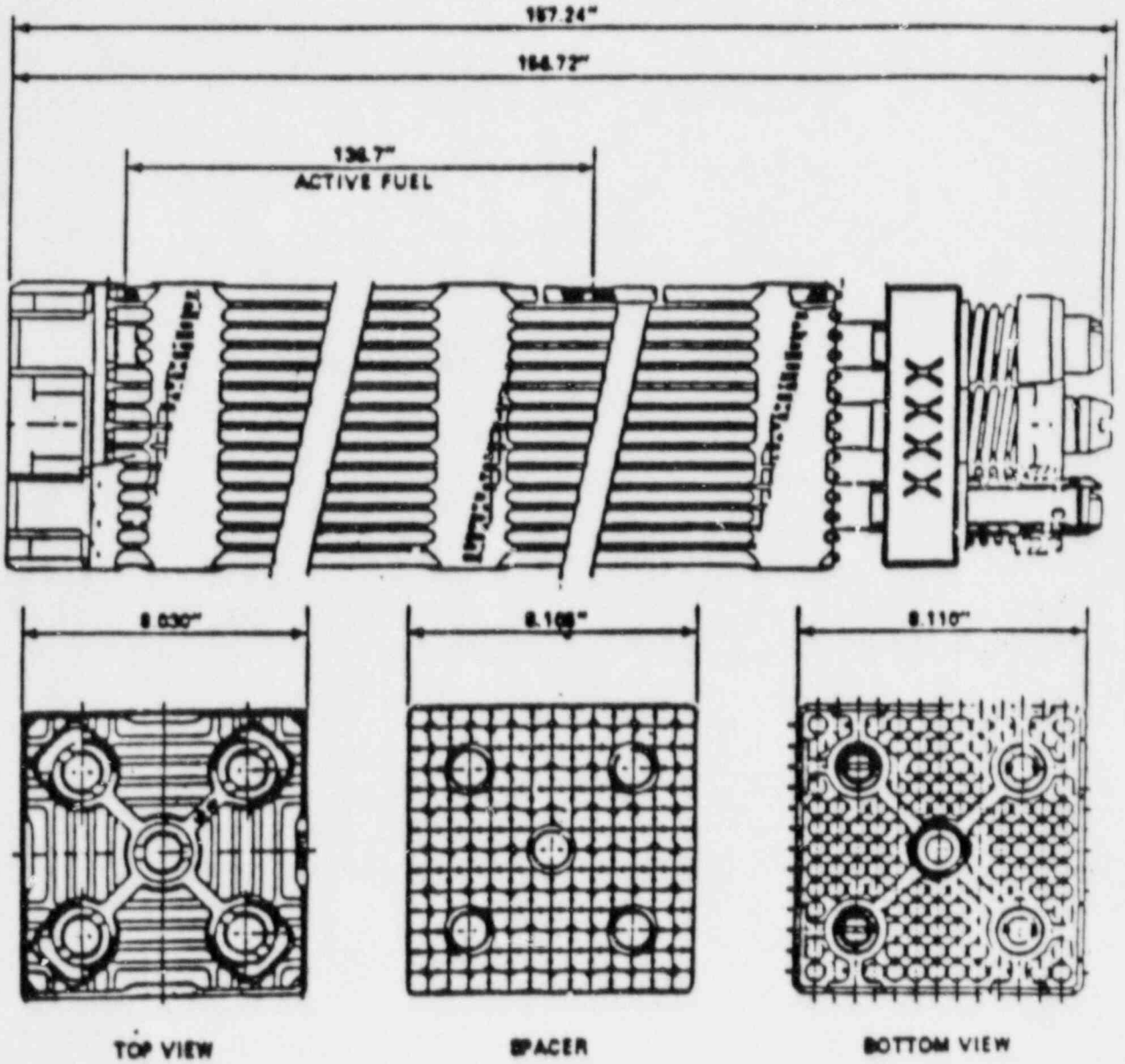


Figure 2-2. Exxon Fuel Assembly, Unit 1

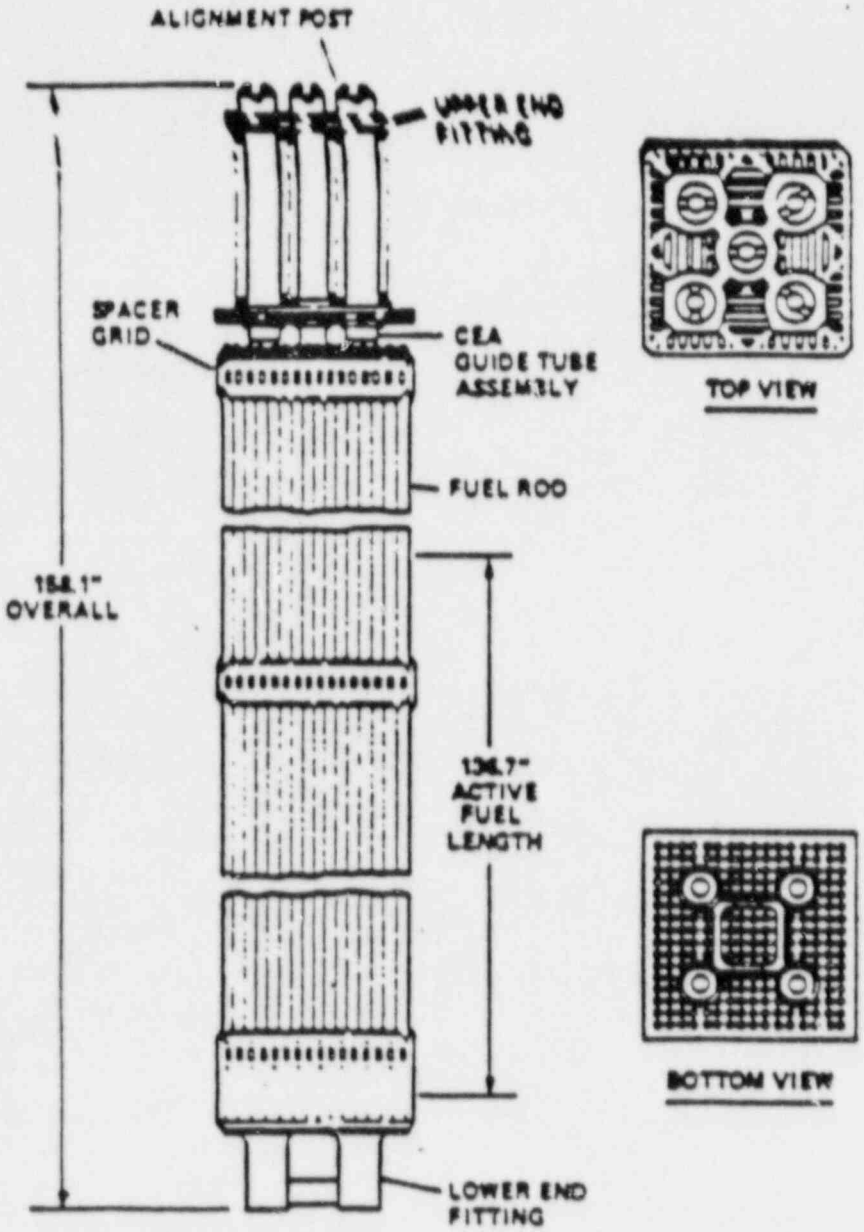


Figure 2-3. Combustion Engineering Fuel Assembly, Unit 2

with Cycle 8, the Licensee has been requested [2] to provide the ENC fuel mechanical parameters to see how they compare with Unit 2 CE fuel assemblies (see Section 2.2.6 for the evaluation of the Licensee response [3]).

2.1.2 Design Adequacy of Unit 2 Spent Fuel Pool and Racks to Accommodate Storage of Unit 1 Fuel Assemblies

To determine the adequacy of Unit 2 spent fuel pool and racks to accommodate storage of Unit 1 fuel assemblies, the applicable sections of the Units 1 and 2 FSARs had to be reviewed and evaluated. For St. Lucie Unit 1, the spent fuel pool is described and evaluated in Section 9.1.2 of the Unit 1 FSAR. The fuel handling system is described and evaluated in FSAR Section 9.1.4. Fuel handling accidents and cask drop accidents are evaluated in FSAR Sections 15.4.3 and 9.1.4, respectively.

For St. Lucie Unit 2, the spent fuel pool is described and evaluated in Section 9.1.2 of the Unit 2 FSAR. The fuel handling system is described and evaluated in FSAR Section 9.1.4. Fuel handling accidents and cask drop accidents are evaluated in FSAR Sections 15.7.4.1.2 and 15.7.4.1.3, respectively.

As stated in the Licensee submittal [1], the proposed license amendment does not alter the type or amount of reactor fuel which can be received, used, and possessed at the site for operation of both St. Lucie units. The amount of reactor fuel that may be stored in the Unit 2 spent fuel pool, and the manner in which it may be stored and handled, will not be altered by the proposed change since the limitations for fuel storage and handling remain governed by the analyses described in the FSAR. Storage of Unit 1 spent fuel in the Unit 2 spent fuel pool will not result in any condition for which the pool is not designed. The assemblies stored in each pool have similar fuel enrichments and burnup histories. Also, as stated in Reference 9, the Unit 2 spent fuel racks have been designed to accommodate storage of Unit 1 fuel assemblies. The Unit 2 racks (see Figure 2-4) were approved by the NRC in Reference 10. The racks are monolithic honeycomb structures with square fuel storage locations, and fabricated from 304 stainless steel that is 0.135 inches thick. Each cell is formed by welding along the intersecting seams, which enables the assembled cells to become a free-standing module that i[illegible]mi-

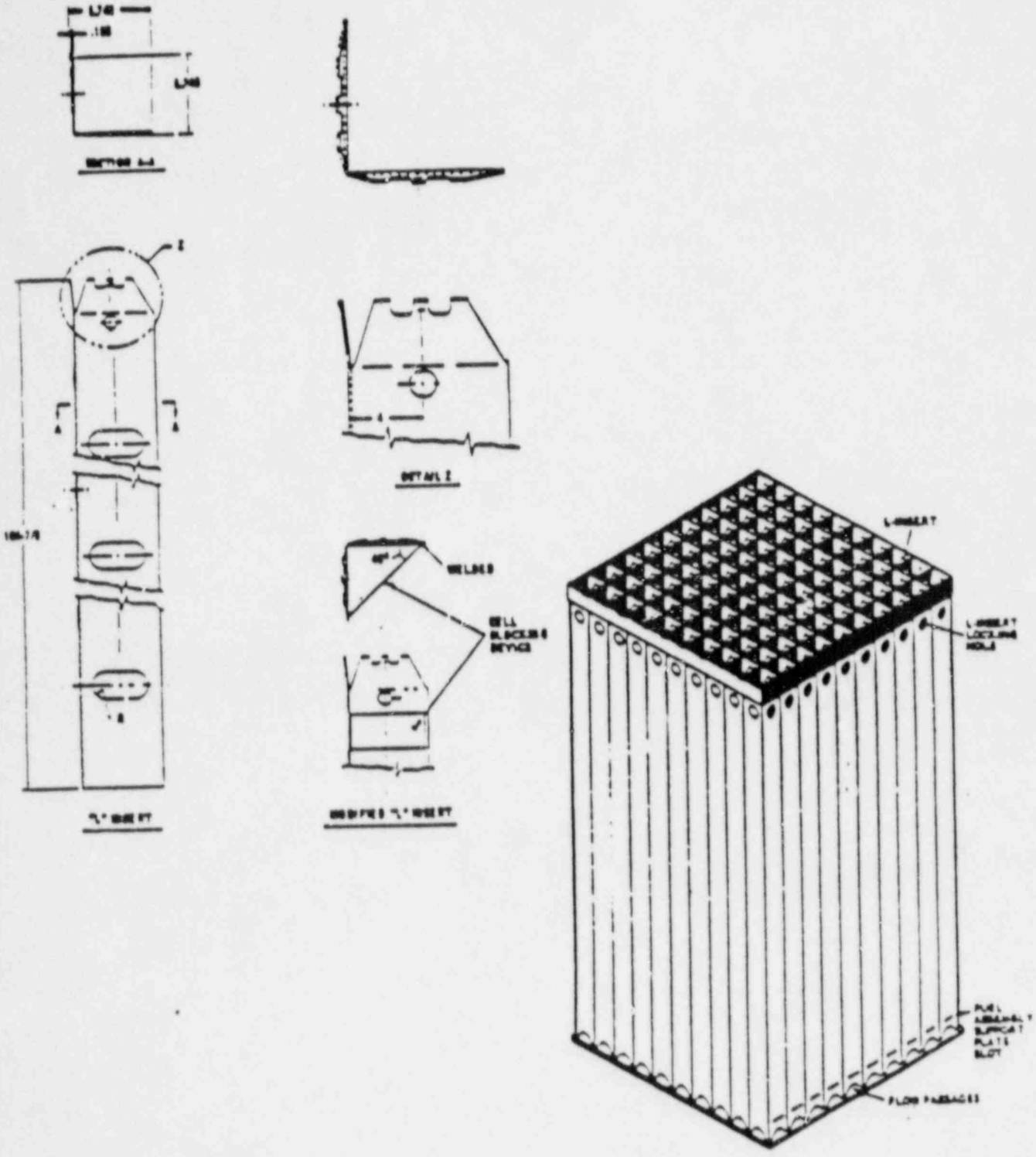


Figure 2-4. Typical Spent Fuel Storage Rack Module for Unit 2

cally qualified without depending on neighboring modules or fuel pool walls for support [11]. The nominal center-to-center spacing of the cells is 8.96 inches.

2.1.3 Spent Fuel Transfer

As stated in the Licensee submittal [1], spent fuel from Unit 1 will be transferred to the Unit 2 spent fuel pool in a fuel shipping cask having a nominal weight of 25 tons or less when loaded. This conforms with Unit 1 Technical Specification 3.9.13, which limits the load that may be handled by the spent fuel cask crane to a maximum of 25 tons. The corresponding limit for the Unit 2 crane (Unit 2 Technical Specification 3.9.12) is 100 tons.

The process will begin with the spent fuel handling machine transferring the assemblies underwater from the spent fuel racks to the spent fuel shipping cask. The cask is designed such that fuel assemblies are placed in the cask while still maintaining the minimum water level above the fuel assemblies. After the cask is loaded with an assembly, it is prepared for transport. Controls will be in effect to reduce possible spread of contamination. The crane then loads the spent fuel shipping cask onto the transport vehicle for travel to Unit 2.

The Licensee submittal does not describe how a spent fuel assembly of Unit 1 will be transferred safely from the shipping cask mounted on the transport vehicle to the designated spent fuel rack of Unit 2. The Licensee has been requested [2] to provide a detailed description regarding the safe handling of the Unit 1 spent fuel assemblies (see Section 2.2.5 for the evaluation of the Licensee response [3]).

2.1.4 Safe Load Path

The load path for transporting the shipping cask between the Unit 1 and Unit 2 fuel handling buildings is shown in Figure 2-5. The Licensee stated [1] that this load path has been evaluated and has been found to provide a safe path for transport of the spent fuel assemblies. For each of the two transporter vehicles considered in the load path evaluation, the maximum wheel loads were found to be acceptable considering the effects on all surfaces, including the roadway, missile protection slabs, and underground facilities (i.e., pipes, electric conduit, manholes, and catch basins).

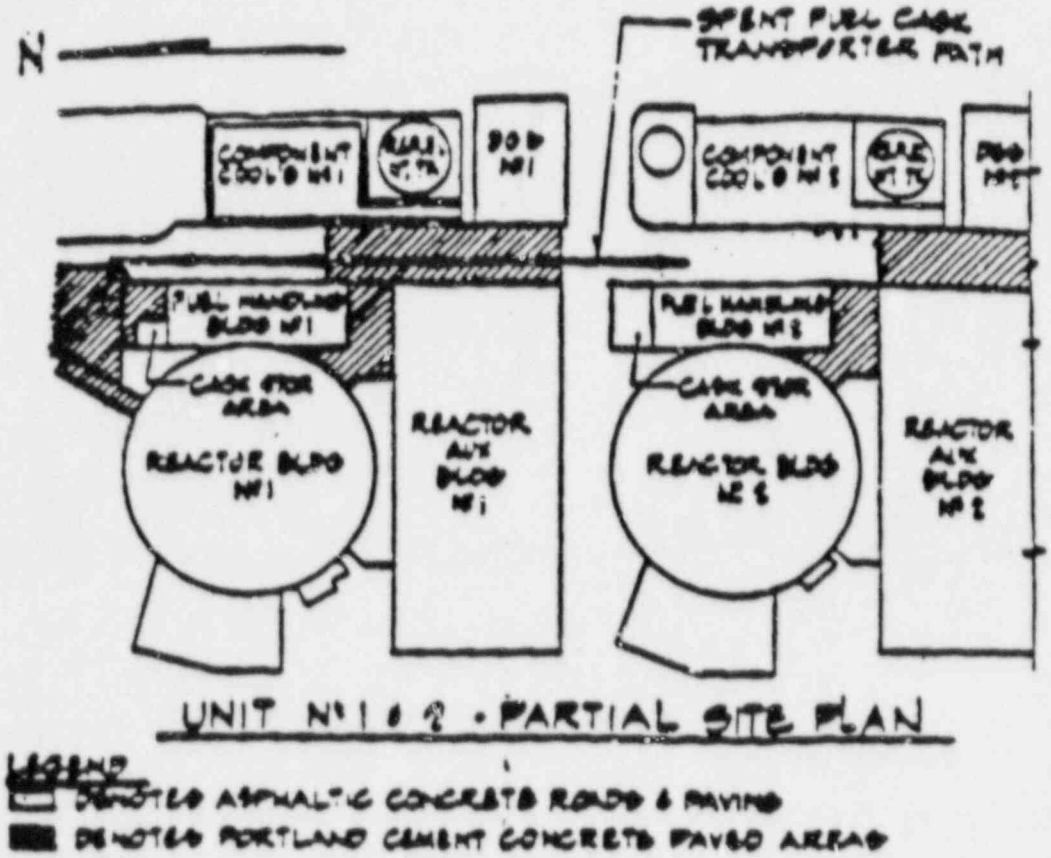


Figure 2-5. Spent Fuel Cask Transporter Path Between Units 1 and 2

The Licensee submittal [1] does not provide any structural analysis summary or structural details of the underground facilities that will be crossed over by either of the two transporter vehicles carrying the spent fuel shipping casks. The Licensee has been requested [2] to provide specific structural details and data pertinent to the findings regarding the safe load path evaluation (see Section 2.2 for the evaluation of the Licensee's response [3] to the RAI [2]).

2.2 EVALUATION OF THE LICENSEE RESPONSES TO THE NRC'S REQUEST FOR ADDITIONAL INFORMATION

This section presents a summary of the Licensee responses [3, 4, 5] to the NRC's request for additional information [2] and the corresponding evaluation comments.

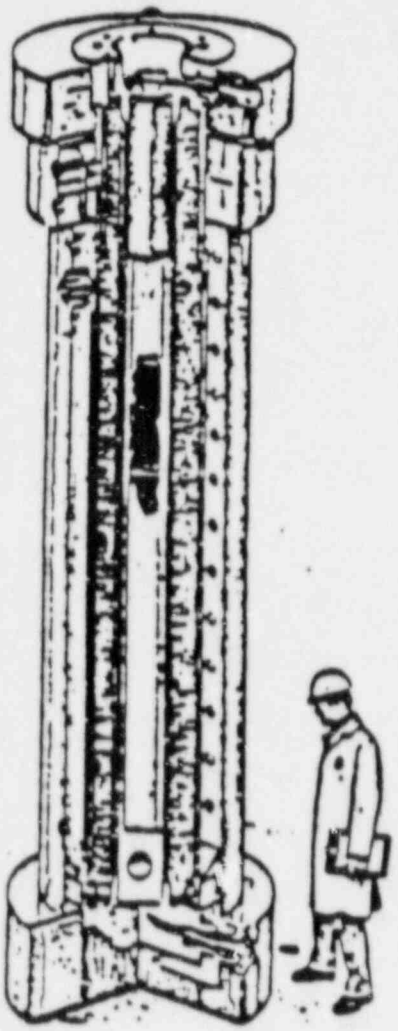
2.2.1 Structural Data of the Spent Fuel Shipping Cask

The spent fuel shipping cask that will be used to transfer spent fuel assemblies from Unit 1 to the Unit 2 spent fuel pool would be either the Model NAC-1 or NL1-1/2. These shipping casks have certificates of compliance No. 9183, Rev. 3, dated November 14, 1984, and No. 9010, Rev. 17, dated August 28, 1986, respectively, issued by the NRC. The basic configuration and the corresponding design data of the two cask models (NAC-1 and NC1-1/2) are shown in Figures 2-6 and 2-7, respectively.

The Licensee response is adequate.

2.2.2 Structural Design Data Pertinent to the Transporter Vehicles

There are two possible cask transporter vehicles to be used for the proposed spent fuel transport between St. Lucie Units 1 and 2: the Rogers Vehicle (RV) and the other vehicle (O). The load path evaluation performed by the Licensee as part of the study compared the loads from the two cask transport vehicles to the original heavy haul route design loads. The original heavy haul route design loads of the roadway, missile protection slabs, and underground facilities were governed by the intermodal cask transporter. Figure 2-8 provides a plan view of the wheel arrangements for



NAC-1 SHIPPING CASK DATA

Cask weight, loaded, lbs.	50,000
Gross vehicle weight, lbs.	< 73,280
Overall cask length, inches	214
Minimum loading height, inches	200
Clearance above highest fixed object, inches	258
Cask diameter, inches	80
Internal cavity length, inches	178
Internal cavity diameter, inches	13.5
Shield thickness, inches	
lead	6.625
water	4.5

Figure 2-6. NAC-1 Shipping Cask Data and Configuration

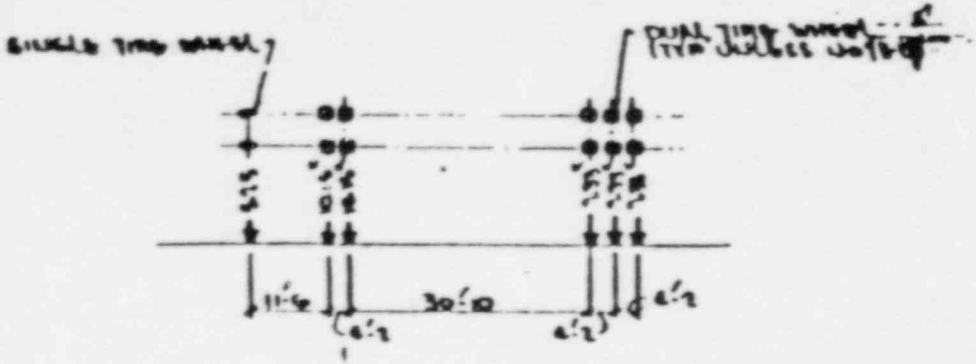
Cask Description

The NL1-1/2 shipping cask is designed and licensed to transport one PWR fuel assembly, two BWR fuel assemblies, or irradiated nuclear components such as control and poison rods. In conjunction with its special trailer, it is a legal weight truck cask capable of unrestricted travel.

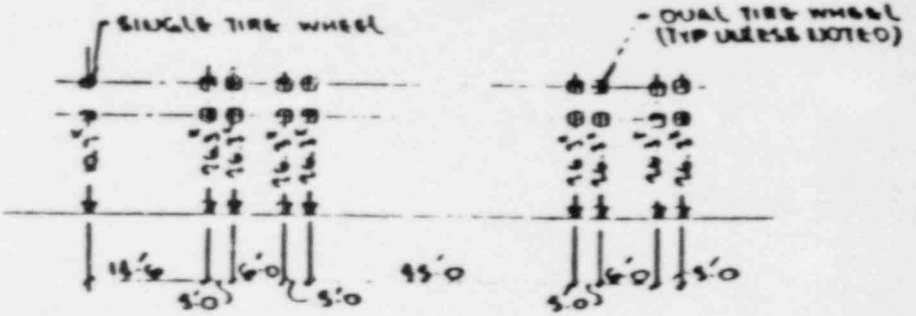
NL-1/2 SHIPPING CASK DATA

Cask weight, loaded, lbs.	50,000
Gross vehicle weight, lbs.	< 73,280
Overall cask length, (max) inches	198
Minimum loading height, inches	193
Clearance above highest fixed object, inches	258
Cask diameter, inches	48
Internal cavity length, inches	178
Internal cavity diameter, inches	13.375
Shield thickness, inches	
lead	2.125
depleted uranium	2.75
water	5.0

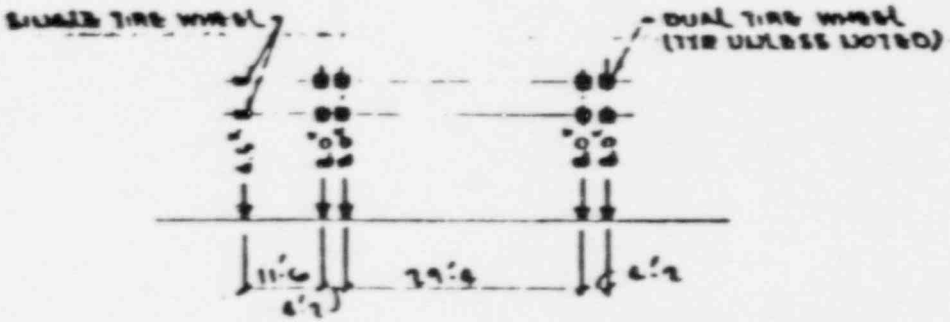
Figure 2-7. NL1-1/2 Shipping Cask Data and Configuration



WHEEL LOAD
ROGERS VEHICLE (RV)
(TOTAL LOAD = 98[K])



WHEEL LOAD
INTERMODAL CASK TRANSPORTER
(TOTAL LOAD = 440[K])



WHEEL LOAD
OTHER VEHICLE (O)
(TOTAL LOAD = 78[K])

NOTES:

1. WHEEL LOADS FOR THE ROGERS VEHICLE (RV) WERE OBTAINED FROM CALCULATION CN-[illegible]. WHEEL ARRANGEMENTS WERE OBTAINED FROM ROGERS BROTHERS CORP. TRAILER DRAWING FOR MODEL = [illegible]-30 SERIAL = [illegible] AND POTAINER TRUCK EQUIPMENT COMPANY TRACTOR / TRAILER DRAWING FOR MODEL = DL-33[illegible]-S-60A.
2. WHEEL LOADS AND WHEEL ARRANGEMENTS FOR OTHER VEHICLE (O) WERE OBTAINED FROM ENCLOSURE 3 ATTACHED TO [illegible] MEMO TO C.E. KNUT DATED 10/15/85. SOME ASSUMPTIONS WERE USED TO DEVELOP THE WHEEL ARRANGEMENT DIMENSIONS.
3. WHEEL LOADS AND WHEEL ARRANGEMENTS FOR THE INTERMODAL CASK TRANSPORTER WERE OBTAINED FROM BRASCO DRAWING 2998-M-641

TER-C5506-665

Figure 2-8. Spent Fuel Transporter Wheel Load

the two cask transporters (RV and O) and the intermodal vehicle as well as wheel information. The information provided in Figure 2-8 is technically sufficient to evaluate structures that would be affected by the loads imposed on the shipping path.

The Licensee's response is adequate.

2.2.3 Structural Details of Missile Protection Slabs and Underground Facilities

The Licensee's response [3] identifies Category 1 underground facilities that are in the path to be crossed by the spent fuel transporter vehicles as those shown on Table 2-2. The table lists the plan layout and structural detail drawings on which the underground facilities can be found (e.g., Manhole 127 (MH 127) is shown in plan on drawing 8770-G-408, Sheet 1, Revision 13 at coordinate J14). Structural details are shown on drawing 8770-G-627, Revision 5, at coordinates E9 and J9 and on drawing 8770-G-628, Sheet 1, Revision 2, in the "Notes." Table 2-3 lists the plan layouts and the structural detail drawings.

After review of all drawings listed in Table 2-3, it was determined that the Licensee's response is technically adequate.

2.2.4 Stress Analysis Results of Missile Protection Slabs and Underground Facilities Crossed by Spent Fuel Transport Vehicles

The Licensee's response [3] to a request to provide stress analysis results of Category 1 structural components that would be crossed by spent fuel transport vehicles is presented in Table 2-2. Table 2-2 provides a summary of stress analysis results indicating that every Category 1 structural component discussed in Section 2.2.3 above has the capability to withstand prescribed sustained and live load with an acceptable margin of safety. For example, Manhole 127 (MH 127) was designed on the basis of ultimate strength design (USD) for an "original design live load" of 26.4 kips and yielded a margin of safety of 1.8; the spent fuel transporter vehicles produce corresponding loads of 7.33 kips for the Rogers vehicle (RV) and 8.0 kips for the other vehicle (O).

Table 2-2. Underground Facilities Crossed by Spent Fuel Transport Vehicle

ITEM IN PATH	PLAN DRAWING(S)	SWC GRID	DRAWING COORDINATE	STRUCTURAL DRAWING(S)	SWC KEY	DRAWING COORDINATE	TYPE OF ANALYSIS	MARGIN OF SAFETY	ORIGINAL DESIGN LIVE LOAD	SPENT FUEL TRANSPORTER VEHICLE WHEEL LOAD	
									LOAD	WT	S
Missile Protection Slab over Pipe Tunnel	8770-C-671	6	C5 to E5	8770-C-671 8770-C-672 8770-C-673	6 3 5	C5 to E5 H1 C15, H15	USD	1.0	20.15[b]	7.33[b]	0.0[b]
Missile Protection Slab over Pipe Tunnel	8770-C-671	6	C9 to E9	8770-C-671 8770-C-672 8770-C-673	6 3 5	C9 to E9 H3 & H5 H11	USD	1.0	20.3[b]	7.33[b]	0.0[b]
30"ϕCV-90	8770-C-170sh1	9	F11 to F14	N/A			Deflection	1.77[1]	52.25[b]	22[b]	16[b]
30"ϕCV-91	8770-C-170sh1	9	F11 to F14	N/A			Deflection	1.77[1]	52.25[b]	22[b]	16[b]
MM126	8770-C-608sh1	13	J17	8770-C-627 8770-C-628 Sh 1	5 2	E9 & J9 Notes	USD	1.43[2]	26[b]	7.33[b]	0.0[b]
MM127	8770-C-608sh1	13	J16	8770-C-627 8770-C-628 Sh 1	5 2	E9 & J9 Notes	USD	1.0	26.4[b]	7.33[b]	0.0[b]
MM128	8770-C-608sh1	13	J13	8770-C-627 8770-C-628 Sh 1	5 2	E9 & J9 Notes	USD	1.0	26.4[b]	7.33[b]	0.0[b]
MM129	8770-C-608	24	L8	8770-C-627 8770-C-628 Sh 1	5 2	E9 & J9 Notes	USD	1.0	26.4[b]	7.33[b]	0.0[b]
MM130	8770-C-608	24	L6	8770-C-627 8770-C-628 Sh 1	5 2	E9 & J9 Notes	USD	1.0	26.4[b]	7.33[b]	0.0[b]
MM136	8770-C-608sh1	13	I10	8770-C-627 8770-C-628 Sh 1	5 2	E9 & J9 Notes	USD	1.0	26.4[b]	7.33[b]	0.0[b]
MM137	8770-C-609sh1	13	G7	8770-C-627 8770-C-628 Sh 1	5 2	E9 & J9 Notes	USD	1.0	20.4[b]	7.33[b]	0.0[b]
MM1991	2990-C-057501	1	B3	2990-C-628 Sh 7 2990-C-627	8 7	E19 Notes	USD	1.43[2]	26[b]	7.33[b]	0.0[b]
MM1992	2990-C-057501	1	B3	2990-C-628 Sh 7 2990-C-627	8 7	E19 Notes	USD	1.43[2]	26[b]	7.33[b]	0.0[b]

Table 2-2. (Cont.)

ITEM IN PATH	PLANT DRAWING(3)	DWG KEY	DRAWING COORDINATE	STRUCTURAL DRAWING (3)	DWG KEY	DRAWING COORDINATE	TYPE OF ANALYSIS	MARGIN OF SAFETY	ORIGINAL DESIGN LIVE LOAD	SPENT FUEL TRANSPORTER VEHICLE WHEEL LOAD	
									LOAD	ST	Q
MB2992	2998-C-017001	1	B3	2998-G-620 Sh 7 2998-C-627	0 7	B10 Notes	USD	1.47(2)	26[5]	7.33[5]	8.0[5]
Manhole Covers	Various			n/a			WSD	2.0	26[5]	7.33[5]	8.0[5]
Electrical Conduit	8770-C-300813 8770-C-406ab1	26 13		n/a			WSD	1.31	52.55[5]	22[5]	15[5]
Missile Protection over Electrical Conduit	8770-C-406ab1	13		8770-G-607 Sh 1 14		A thru D13	WSD	1.0	44[5]	7.33[5]	8.0[5]

NOTES: (1) Margin of safety (MS) for deflection is based on allowable deflection of 2 % of diameter; actual deflection is 1.13 % of diameter; MS = 2.0/1.13 - 1.77

(2) Margin of safety (MS) is based on a required area of steel of .81 sq. in. and a provided area of steel of 1.19 sq. in. MS = 1.19/.81 - 1.47

(3) See Attachment 4 for drawings.

ABBREVIATIONS: USD - Ultimate strength design

WSD - Working stress design

MH - Manhole

S - Service

CW - Circulating & Intake Cooling water system

ST - Spent Fuel Cask Transporter - Rogers vehicle - shown on Figure 1

S - Spent Fuel Cask Transporter - shown on Figure 1

DEFINITIONS FOR TERMS IN TABLE

Type of Analysis -
This denotes the method of analysis used to determine a design that is acceptable.

Margin of safety -
This defines the ratio between the original design requirements and original design allowables of the item. It is based on the "original design live load".

Original Design Live Load -
This is the live load that was applied at the road surface and used to design structures in the load path.

Transporter vehicle wheel load -
This shows the wheel load from the vehicles that will transport the fuel between units. The wheel loads are presented in a manner equivalent to those presented for "original design live load".

Table 2-3. Plan Layouts and Structural Detail Drawings Reviewed

Drawing No.	Rev. No.	Title
8770-C-170 Sh 1	9	Yard Piping Sh No. 1A
8770-C-388	24	Diesel Generator Building - Conduit, Grounding & Lighting
8770-C-407 Sh 1	14	Yard Duct Runs
8770-C-408 Sh 1	13	Yard Duct Runs and Lighting Plan, Sections and Details - Sh 1
8770-C-627	5	Electrical Manhole Details - M&R Sh 1
8770-C-628 Sh 1	2	Electrical Manhole Details - M&R Sh 2
8770-C-671	6	Component Cooling Pumps - Foundations Masonry
8770-C-672	3	Component Cooling Pumps - Mas & Reinf Sh 1
8770-C-673	5	Component Cooling Pumps - Mas & Reinf Sh 2
2998-C-057 501	1	Yard Composite Sh 1
2998-C-627	7	Elec. Manhole Details - M&R
2998-C-628 Sh 7	0	Elec. Manhole Details - M&R

NOTE: 8770- denotes St. Lucie #1 drawings and 2998- St. Lucie #2.

The "margin of safety" shown in Table 2-2 is based upon the "original design live load." By comparing the original design live loads with the spent fuel transporter vehicle wheel loads shown in Table 2-2, it can be seen that the spent fuel transporter vehicle wheel loads are no more than half of the original design live loads. Accordingly, the margins of safety for the spent fuel transporter vehicle are considerably higher than the margin of safety shown in Table 2-2. The following example presented by the Licensee [5] describes how this conclusion was reached for one of the missile protection slabs (second item on Table 2-2).

The missile protection slab over the pipe tunnel was designed for the maximum wheel load from the intermodal cask transporter. This load consists of two 26.3-kips concentrated loads spaced 5'0" apart (see Figure 2-8). Each 23.6-kips load represents the maximum load exerted by one dual-tired wheel.

The Rogers vehicle (RV), one of the two possible vehicles to be used for the proposed spent fuel transport between units, consists of a tractor and a drop deck lowboy. The rear wheels of the tractor present a similar case for comparison with the design basis intermodal cask transporter. The maximum wheel load at this location is 10.15 kips per dual-tired wheel; the wheels, and therefore the loads, are spaced 4'2" apart (see Figure 2-8). This case affords a direct comparison with the design basis condition. It is apparent that substantial additional margin is provid in the design to accommodate this load (i.e., 10.15 kips < 23.6 kips).

The arrangement of the rear wheels of the lowboy differs from that of the intermodal cask transporter. The maximum wheel load at this location is 7.3 kips per dual-tired wheel. There are three wheels in tandem spaced 4'2" apart. For the purposes of comparison with the design basis case, these loads are conservatively assumed as grouped together into one 22-kips load. It can be seen that this combined load from three wheels, assumed to be acting at one point, is still less than a single wheel load from the intermodal cask transporter (23.6 kips). It is therefore apparent that this case is also less severe than the design basis condition.

The other vehicle to be used for spent fuel transport (designated as the "O" vehicle on Figure 2-8) also presents a similar case for comparison with the intermodal cask transporter. The maximum wheel load, either at the rear of the tractor or the rear of the trailer, is 8 kips per dual tire wheel; the

spacing of the wheels is assumed to be similar to that of the other vehicles, however, this is not a critical assumption, since grouping the wheel loads as described above still produces a load (16 kips) less than a single wheel load from the intermodal cask transporter (23.6 kips). It is, therefore, apparent that this case is much less severe than the design basis condition.

Tractor front wheel loads are in every case much less than the other wheel loads and, therefore, do not govern.

The tire size for the intermodal cask transporter (12" x 20") is smaller than that for the Rogers vehicle (12" x 24") and therefore represents a more severe case for design check of punching shear. Tire size data for the "O" vehicle were not available; however, since those loads are much smaller than the design basis loads, it seems reasonable to conclude that nominal variations in tire size such as might be expected will not alter the conclusions of this evaluation.

Based on structural evaluation of the Licensee's response [3, 4, 5], it is concluded that Category 1 structural components listed in Table 2-2 have the capability to withstand the prescribed sustained and live loads imposed by spent fuel transporter vehicles.

2.2.5 Safe Handling of Unit 1 Spent Fuel Assemblies

As stated in the Licensee's response [3], the shipping cask will be moved into position under the Unit 2 cask crane after following the predetermined spent fuel transfer path from Unit 1. The Unit 2 cask crane is moved into position and picks up the cask lifting yoke. The trailer down-riggers are then lowered, wheel chocks are installed, the tractor is disconnected and driven to its parking place. The bolts which retain the forward trunnion mounts are removed and stored. The cask lifting yoke is positioned over the upper lifting trunnions and manually engaged to the lifting lugs. The cask is lifted to the vertical position and then lifted clear of the transport trailer. The cask is placed in the Unit 2 cask wash area where it is prepared for movement into the Unit 2 spent fuel storage pool. The inner head closure bolts are detensioned, and the cask is lifted into position over the center of the pool cask area. Demineralized water is sprayed on the cask as it is lowered into the pool through the [illegible] ring. When the top of the cask is

at a convenient height above the pool water level, the demineralized spray is stopped, the inner closure head bolts are removed and placed in storage, and the demineralized water is again started as the cask continues to be lowered to the bottom of the cask loading area floor.

For the NAC-1 (Figure 2-6), the cask crane hook is detached from the cask crane lifting yoke bale. The hook is washed down with demineralized water as it is retracted out of the pool. For the NL1-1/2 (Figure 2-7), the cask lifting yoke arms are disconnected from the cask using the arm-mounted hydraulic actuating system. The inner cask cover is removed as the yoke is lifted out of the pool. A spray of demineralized water is again used to wash down the cable system, the crane hook, the lifting yoke, and the inner cask cover.

After a period of drip drying, the trolley is backed out of the pool a sufficient distance to allow free access too the cask top by the spent fuel bridge crane (SFBC). For the NAC-1, the SFBC is positioned over the cask and the inner cask cover lifting point is engaged. The cover is then removed and placed in a designated temporary storage location for replacement after the fuel assembly has been removed from the cask. The inner cover lifting tool is then placed in its designated temporary storage location. For both the NAC-1 and the NL1-1/2, the SFBC then moves into position over the cask opening to latch onto the fuel assembly. Once latched, the fuel assembly is picked up by the SFBC, moved through the Unit 2 cask keyway door, and taken to a predetermined pool storage location where it is lowered into place. The SFBC unlatches from the fuel assembly and returns to its designated storage/parking position.

Based on evaluation of the aforementioned response, it is concluded that safe handling of Unit 1 spent fuel assemblies is adequately demonstrated.

2.2.6 Mechanical Design Parameters of Fuel Assemblies Designed by Exxon Nuclear Company (ENC)

The Licensee response [3] stated that the basic mechanical design parameters of ENC spent fuel assemblies are described in ENC Topical Report XN-NF-82-09 [6]. The Licensee indicated that it would initially plan to move

only the fuel which has had the longest decay time. As a result, Batch A assemblies, which were removed from Unit 1 reactor at the end of Cycle 1, would be moved first. These assemblies have almost 9 years of decay time and are spent fuel assemblies (SFAs) of the Combustion Engineering (CE) design. The basic mechanical design parameters of these CE-designed SFAs are shown in Table 2-1.

3. EVALUATION OF THE LICENSEE'S NO SIGNIFICANT HAZARDS CONSIDERATION

The NRC has provided standards for determining whether a significant hazards consideration exists (10CFR50.92(c)). A proposed amendment to an operating license for the facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) creatn the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety.

As the Licensee stated in its submittal [1]:

1. This amendment will not significantly increase the probability or consequences of an accident previously evaluated since the configuration and operation of the plant will remain essentially the same. The only thing that will change is that a certain number of Unit 1 spent fuel assemblies may be transferred from the Unit 1 spent fuel pool to the Unit 2 spent fuel pool. The designs of the two pools, and the associated operating and accident analysis assumptions, are not changed. The Unit 1 assemblies that may be transferred have essentially the same mechanical design (size), enrichments, and burnup histories as evaluated in the Unit 2 FSAR for Unit 2 fuel assemblies. As stated in Reference 11, the Unit 2 spent fuel racks are designed to accommodate storage of the Unit 1 fuel.

2. This amendment will not create the possibility of a new or different kind of accident from any previously evaluated, since this change does not modify the configuration or operation of the plant. A spent fuel shipping cask that meets the packaging and transportation requirements of 10CFR71 will be used to transfer spent fuel assemblies between the Unit 1 and Unit 2 fuel handling buildings. Potential fuel handling and cask drop accidents are evaluated in both FSARs, including the potential drop of a cask outside the fuel handling building. The load handling and transport of the spent fuel are enveloped by previous analyses.

3. This amendment will not involve a significant reduction in the margin of safety. In all cases, the FSAR accident analyses results bound all accident scenerios contemplated by this amendment.

Therefore, on the basis of the above discussion, it is concluded that operation of St. Lucie Unit 2 in accordance with the proposed amendment would pose no threat to the public health and welfare, and would not involve a significant hazards consideration.

V. CONCLUSIONS

Based on review and evaluation of the Florida Power and Light Company submittals [1, 3, 4, 5] pertaining to the request to amend Facility Operating License NPF-16 of St. Lucie Unit 2, the following conclusions have been reached:

1. The design margins of safety of Category 1 structural components (missile protection slabs and underground facilities) under loads imposed by the crossing of spent fuel transport vehicles have been evaluated and found to be acceptable. Accordingly, the load path proposed in the Licensee amendment for transporting spent fuel assemblies from Unit 1 to Unit 2 has been found safe.

2. The safe handling of Unit 1 spent fuel assemblies is adequately demonstrated.

3. Based on the above conclusion, operations of St. Lucie Unit 2 in accordance with the proposed amendment would pose no threat to the public health and welfare, and would not involve a significant hazards consideration.