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Dockets Nos. 50-250
and 50-251

Florida Power and Light Company
ATTN: Dr. Robert E. Uhrig
Vice President
P. O. Box 013100
Miami, Florida 33101

Gentlemen:

The Commission has issued the enclosed Amendment No. 25 to Facility Operating License No. DPR-31 and Amendment No. 22 to Facility Operating License No. DPR-41 for the Turkey Point Nuclear Generating Units Nos. 3 and 4. The amendments consist of changes to the licenses and their appended Technical Specifications in response to your application dated January 28, 1976, and supplements thereto dated April 30, May 10 and 25, June 1, August 3, October 15 and 27, 1976 and February 10 and 16, 1977.

The amendments authorize expansion of the spent fuel storage pool capacity by replacing the existing spent fuel storage racks, which have a capacity for 235 fuel assemblies at Unit No. 3 and 217 at Unit No. 4, with new racks which have a capacity for 621 fuel assemblies per Unit.

Copies of the Safety Evaluation, Environmental Impact Appraisal, and the Federal Register Notice - Negative Declaration, are also enclosed.

Sincerely,

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosures:
1. Amendment No. to License DPR-31
2. Amendment No. to License DPR-41
3. Safety Evaluation
4. Environmental Impact Appraisal
5. Federal Register Notice/Negative Declaration

cc: See next page

OFFICE➤	ORB#3	ORB#3	OELD	ORB#3	AD/DOR
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DATE➤	2/ /77	2/ /77	2/ /77	2/ /77	2/ /77

NRC FORM 318 (9-76) NRCM 0240 ☆ U. S. GOVERNMENT PRINTING OFFICE: 1976 – 626-624 cc:

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

FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-250

TURKEY POINT NUCLEAR GENERATING UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 23
License No. DPR-31

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

   A. The application for amendment by Florida Power and Light Company (the licensee) dated January 28, 1976, as supplemented by filings dated April 30, May 10 and 25, June 1, August 3, October 15 and 27, 1976, and February 10 and 16, 1977, 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, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraphs 2.B. and 3.B. of Facility Operating License No. DPR-31 are hereby amended to read as follows:

   2.B. Pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

   3.B. Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 23, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Karl R. Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 17, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 23

TO THE TECHNICAL SPECIFICATIONS

FACILITY OPERATING LICENSE NO. DPR-31

DOCKET NO. 50-250

Replace pages 5.4-1 of the Appendix A portion of the Technical Specifications with the attached revised page 5.4-1. The changed area on the revised page is shown by a marginal line.

5.4 FUEL STORAGE

1. The new and spent fuel pit structures are designed to withstand the anticipated earthquake loadings as Class I structures. Each spent fuel pit has a stainless steel liner to ensure against leakage.

2. The new and spent fuel storage racks are designed so that it is impossible to insert assemblies in other than the prescribed locations. The fuel is stored vertically in an array with sufficient center-to-center distance between assemblies to assure k_{eff} equal to or less than 0.95 with new fuel containing not more than 43.9 grams of U-235 per axial centimeter of fuel assembly even if boron was not added to the pit water.

3. The boron concentration in the spent fuel pit is that used in the reactor cavity and refueling canal during refueling operations, whenever there is fuel in the pit, except for initial new fuel storage.

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

FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-251

TURKEY POINT NUCLEAR GENERATING UNIT NO. 4

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 22
License No. DPR-41

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

   A. The application for amendment by Florida Power and Light Company (the licensee) dated January 28, 1976, as supplemented by filings dated April 30, May 10 and 25, June 1, August 3, October 15 and 27, 1976 and February 10 and 16, 1977, 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, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraphs 2.B. and 3.B. of Facility Operating License No. DPR-41 are hereby amended to read as follows:

   2.B. Pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

   3.B. Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 22, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Karl R. Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 17, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 22

TO THE TECHNICAL SPECIFICATIONS

FACILITY OPERATING LICENSE NO. DPR-41

DOCKET NO. 50-251

Replace page 5.4-1 of the Appendix A portion of the Technical Specifications with the attached revised page 5.4-1. The changed area on the revised page is shown by a marginal line.

5.4 FUEL STORAGE

1. The new and spent fuel pit structures are designed to withstand the anticipated earthquake loadings as Class I structures. Each spent fuel pit has a stainless steel liner to ensure against leakage.

2. The new and spent fuel storage racks are designed so that it is impossible to insert assemblies in other than the prescribed locations. The fuel is stored vertically in an array with sufficient center-to-center distance between assemblies to assure k_{eff} equal to or less than 0.95 with new fuel containing not more than 43.9 grams of U-235 per axial centimeter of fuel assembly even if boron was not added to the pit water.

3. The boron concentration in the spent fuel pit is that used in the reactor cavity and refueling canal during refueling operations, whenever there is fuel in the pit, except for initial new fuel storage.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 23 TO LICENSE NO. DPR-31, AND

AMENDMENT NO. 22 TO LICENSE NO. DPR-41

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT NUCLEAR GENERATING UNITS NOS. 3 AND 4

DOCKETS NOS. 50-250 AND 50-251

Introduction

By letter dated January 28, 1976, Florida Power and Light Company (FPL) proposed amendments to Facility Operating Licenses Nos. DPR-31 and DPR-41 for Turkey Point Nuclear Generating Units Nos. 3 and 4. The license amendments were proposed by FPL because of their desire to install new spent fuel assembly storage racks in the spent fuel pools at each Turkey Point facility. The proposed rack modification would increase the spent fuel pool storage capacity at each facility to 621 fuel assemblies. Supplemental information in support of the proposed facility modification was provided by FPL in their letters dated April 30, 1976, May 10, 1976, May 25, 1976, June 1, 1976, August 3, 1976, October 15, 1976, October 27, 1976, February 10, 1977 and February 16, 1977. Notice of Proposed Issuance of an Amendment to Facility Operating License relating to the spent fuel pool expansion was published in the Federal Register on March 25, 1976 (41 F.R. 19363).

On September 24, 1976, the Commission approved License Amendment No. 20 to Facility Operating License DPR-31 which temporarily allowed the storage capacity of the Unit No. 3 spent fuel storage pool to be increased from 217 to 235 fuel assemblies. License Amendment No. 20 specifically limited the Unit No. 3 spent fuel pool storage capacity to 235 fuel assemblies for a period not to exceed one year from September 24, 1976, at which time the pool capacity would revert to 217 assemblies unless otherwise approved by the NRC. This current licensing action will supplant License Amendment No. 20 as it applies to Unit No. 3.

Discussion

A. Existing Facilities

The existing spent fuel storage pool at each Turkey Point facility has permanent storage capacity for 217 fuel assemblies. These existing racks maintain a 21 inch center-to-center distance between the stored fuel assemblies. Borated water fills the spent fuel storage pool and surrounds the spent fuel storage racks. The existing center-to-center distance of the storage racks is such that a K_{eff} of less than

0.90 is maintained even in the event that unborated water is used to fill the storage pool.

The spent fuel pool cooling system was designed to remove decay heat from the spent fuel assemblies stored in the pool and to control the chemistry and clarity of the pool water. The spent fuel pool cooling system was designed to maintain the pool water at a temperature of approximately 120°F during normal refueling operations and less than 150°F during the full core offload condition.

B. Proposed Facilities

FPL proposes to increase the capacity of the spent fuel storage pool at each Turkey Point facility by replacing the present fuel storage racks with racks of a new design. The new racks have a reduced center-to-center spacing between the stored fuel assemblies of 13.66 inches. The new racks, which are manufactured by the Combustion Engineering Corporation, hold the spent fuel assemblies vertically in individual square storage tubes. These storage tubes are joined together to form a fuel assembly storage module. There are twelve storage modules in each storage pool. Each module is supported by four corner supports which rest on bearing pads welded to the storage pool floor. The modules are free standing, are not interconnected and are not braced with lateral restraints of the pool wall. The entire fuel storage rack assembly is constructed of type 304 stainless steel.

The proposed modification will not alter the external physical geometry of the spent fuel storage pool or require modifications to the present spent fuel pool cooling system.

Evaluation

A. Criticality Consideration of New Rack Design

The nominal center-to-center spacing for the stored fuel assemblies will be reduced from 21 inches to 13.66 inches by installation of the new racks. This reduced spacing tends to cause an increase in the effective neutron multiplication factor, K_{eff}, of the array. This increase in K_{eff} is partially compensated by the increased amount of structural material.

FPL provided information on the methods used to analyze the reactivity of the proposed storage racks and the results of their analyses. These analyses were verified by FPL by comparisons to 5 separate sets of critical experiments.

We independently performed a criticality analysis to demonstrate that the proposed spent fuel storage racks were properly spaced. The nominal calculated K_{eff} for the proposed storage racks is 0.87 assuming the pool is filled with unborated water. When the effects of uncertainties in dimensions, pool temperature and calculational methods are included, K_{eff} could be as high as 0.89.

This value satisfies our requirement that K_{eff} be maintained below 0.95. To assure that K_{eff} will be maintained at an acceptable value, we have included in the Technical Specifications, with FPL's concurrence, the requirement that the fuel loading of a stored fuel assembly be limited to 43.9 grams of U-235 per axial centimeter of fuel assembly length. The present Technical Specification requirement that the pool be filled with borated water whenever spent fuel is in the pool also gives added assurance that K_{eff} will be less than 0.95.

We also investigated the effect on criticality of a loss of pool cooling. We concluded that there would be no significant effect on pool criticality resulting from water temperature changes. In the extreme case boiling could occur in the spent fuel storage pool due to a complete loss of pool cooling. However, because the only significant heat source is within the boundaries of the stored fuel assemblies, boiling will only occur within the fuel assemblies themselves. Therefore, we conclude that any void formation due to boiling will also be within the fuel assemblies and not within the water spaces between the tubes supporting the stored fuel assemblies. The formation of voids within the fuel assemblies would result in a decrease in K_{eff}. Therefore, we conclude that following a complete loss of pool cooling K_{eff} will remain less than 0.95.

On the basis of our review, we conclude that the criticality considerations of the proposed spent fuel storage pool modification are acceptable.

B. Thermal Considerations

The cooling systems for the spent fuel pools at each facility were designed to maintain the pool water at a temperature of 120°F during normal refueling operations and less than 150°F during the full core offload condition. FPL evaluated the capability of the existing spent fuel pool cooling systems to maintain an acceptable water temperature following installation of the increased capacity storage racks. We independently reviewed the cooling system for each pool and based on our review we concluded that the existing cooling systems will maintain the water temperature in each pool following the installation of the new racks at approximately 127°F during normal refueling and less than 150°F during full core offload. To give added assurance that an operating cooling system is always available for each spent fuel pool, FPL plans to install a 100% capacity spare pump in each spent fuel pool cooling system. The spare pump will be capable of operating in place of the original pump and will provide immediate backup capability for the most critical active item in the spent fuel pool cooling system.

We made a conservative analysis of the spent fuel pool heat-up time in the event that the pool cooling system fails. The minimum time to reach boiling from a pool water temperature of 150°F would be 8.5 hours under the most adverse conditions (following a full core offload). If the spent fuel pool cooling system should fail following a normal refueling, it would take at least 24 hours for the pool water to reach boiling temperature. Therefore, in the event of a cooling system failure, we conclude there is sufficient time for the operator to effect a system repair or connect to an alternate cooling system. In the event of a loss of the normal water supply to either spent fuel pool, alternate supplies can be provided from: (1) the refueling water storage tank, (2) the primary system water storage tank or (3) the fire water system.

On the basis of our review, we conclude that the heat removal capability of the spent fuel pools will be adequate following installation of the new storage racks.

C. Shipping Cask Handling System

The installation of the new spent fuel storage racks within the storage pools will not reduce the size of the shipping cask laydown area within the pools. The Technical Specifications presently prohibit movement of a spent fuel shipping cask over fuel assemblies stored in the spent fuel storage pool. To assure that this requirement will not be violated, FPL will install a shipping cask crane movement interlock system prior to June 1977. In the interim period until June 1977, FPL has instituted augmented operating procedures which fulfill the same functions as the crane movement interlock system. We previously evaluated the shipping cask crane interlock system and the interim augmented crane operating procedures (Amendment No. 18 to License No. DPR-31 and Amendment No. 17 to License No. DPR-41, dated July 9, 1976). Based on our previous evaluation, we determined that either the crane movement interlock system or the interim augmented crane operating procedures would assure that a spent fuel shipping cask would not be moved over stored spent fuel.

We have reviewed the shipping cask handling system as it is affected by the installation of the new high capacity spent fuel storage racks. Based on this review, we have determined that either the crane movement interlock system or the interim augmented crane operating procedures will assure that a spent fuel shipping cask will not be moved over stored spent fuel following installation of the new high capacity fuel assembly storage racks.

D. Tipped or Dropped Cask in Fuel Pool

The Technical Specifications presently require a minimum period (1000 hours) for the decay of stored spent fuel before a shipping cask may be moved into the spent fuel storage pool. This requirement was placed in the Technical Specifications to assure that in the event a shipping cask were dropped in the storage pool and fell on stored fuel assemblies the resulting release of activity past the facility boundary would not be unacceptable. Since the Technical Specifications prohibit the movement of a shipping cask over the stored fuel, such an accident could only result from the dropped cask tipping during its fall.

We independently reevaluated the tipped cask accident following installation of the new high capacity fuel assembly storage racks. Our evaluation revealed that if all the fuel rods were damaged in all the fuel assemblies upon which a tipped cask could impact (40 fuel assemblies), the conservatively estimated two-hour radiation doses at the exclusion area boundary would be 24 Rem to the thyroid and less than 1 Rem to the whole body, assuming a 1000-hour fuel decay period. These estimated doses are well below the two-hour doses of 300 Rem thyroid and 25 Rem whole body given in 10 CFR 100 as guideline doses to the public following a postulated fission product release. Therefore, we conclude that the required 1000-hour fuel decay period will assure that in the event a shipping cask were dropped in the storage pool and thereby fell on stored fuel assemblies, the resulting release of activity beyond the facility boundary would not be unacceptable.

We have also performed an additional review of the cask drop accident to determine if K_{eff} could be significantly affected by a change in fuel assembly configuration resulting from the dropped cask impacting the fuel storage racks. Based on our review, we concluded that the required use of borated water at the refueling boron concentration in the spent fuel pools will assure that K_{eff} remains less than 0.95 for all possible cask drop accidents. A K_{eff} of less than 0.95 satisfies our requirements and assures that no undesirable criticality conditions will result from a dropped and tipped cask accident.

We also reviewed the potential consequences of the design basis fuel handling accident in which it is postulated that a fuel assembly, following removal from the reactor, is dropped in the transfer canal or spent fuel pool. We have found that the potential consequences of this accident remain unchanged from the consequences found acceptable by the staff in our Safety Evaluation dated March 15, 1972 (two hour doses at the site boundary of 17 Rem thyroid and less than 2 Rem whole body).

Based on our review, we have determined that the radiological consequences of: (1) a tipped or dropped cask accident in the spent fuel storage pool and (2) a dropped fuel assembly accident are both acceptable.

E. Structural and Material Considerations

The new high capacity spent fuel pool storage racks are constructed so that the materials, design, fabrication, installation and quality control requirements are in accordance with Subsection NF of Section III of the ASME Boiler and Pressure Vessel Code. The new storage racks are designed to remain within acceptable stress limits for loading conditions which include the effects of normal loads, thermal loads, shipping and installation loads, seismic loads and loads imposed by a dropped fuel assembly.

The seismic design of the new racks is based on the response spectra and damping values presented in the Turkey Point Final Safety Analysis Report (FSAR). No benefit is taken for the damping effect of the water. Furthermore, the seismic excitation along three orthogonal directions was imposed simultaneously for the design of the new rack system. In determining the seismic response of the racks, FPL performed a non-linear time history analysis which included the effects of gaps and submergence in water. Both infinite friction conditions and low values of friction between the racks and the pool floor were considered in the analysis. When considering the low value of friction, the maximum slip motion for each rack module during the maximum design basis earthquake was determined to be less than the clearance of one inch between modules. Even though this analysis demonstrated that impact between modules would not occur, FPL determined that for rack velocities approximately five times larger than those predicted, resultant impact loadings for fully loaded racks would not exceed acceptable limits. FPL also determined that each rack module will have a factor of safety against overturning in excess of 2.0 for loadings which include the effects of the maximum design basis earthquake.

FPL performed a review of the load carrying ability of the spent fuel pool structure and found that the structure and liner are capable of supporting the increase in overall loading as a result of the proposed fuel pool modification. With the exception of the increase load due to the additional fuel assemblies, the loads and load combinations considered in the analysis are the same as those listed in Appendix 5A of the FSAR for Class I structures. For each load combination, including the increased load due to the additional fuel assemblies, the stresses in the structure will remain within the allowable limits stated in Appendix 5A of the FSAR. The temperature limits established in the FSAR for the spent fuel pool are not changed with the present modification. Therefore, the effects of temperature gradients on the pool structure remain unchanged.

The criteria used by FPL in the analysis, design, and construction of the new spent fuel storage racks to account for anticipated loadings and postulated conditions that may be imposed upon the structures during their service lifetime are in conformance with established criteria, codes, standards, and specifications found acceptable to the NRC. The use of these criteria assure that the new fuel pool structures will withstand the specified design conditions without: (1) impairment of structural integrity or (2) reduced ability to perform required safety functions. We have reviewed the structural design and material considerations of the high capacity spent fuel storage racks and we find it has been performed in an acceptable manner and is therefore acceptable.

F. Installation Considerations

The installation of the new spent fuel storage racks at each Turkey Point facility will be combined with the replacement of the spent fuel pool liner. Prior to the removal of the old racks and the installation of the new racks at either facility, the stored fuel assemblies will be moved to the other facility's spent fuel storage pool. By performing these operations separately at each facility it is possible to remove the old racks and install the new racks in a dry pool which has been emptied of all stored fuel assemblies.

In order to avoid unnecessary personnel risks during the facility modification, FPL has prepared and adopted special written procedures. We have reviewed the outline of FPL's procedures for the installation of the new fuel assembly storage racks and have determined they are acceptable.

The special procedures being instituted by FPL for this facility modification and the radiation protection procedures routinely utilized by FPL will assure that the removal of the old racks and the installation of the new racks is a relatively minor operation from a radiation exposure standpoint. Therefore, we have concluded that personnel performing the installation of the new storage racks will not be exposed to unacceptable levels of radiation.

G. Radiation Levels Following Modification

We have evaluated the increment in onsite occupational doses resulting from the proposed increase in the number of stored fuel assemblies. Our evaluation was based on information supplied by FPL and was based on realistic assumptions for water cleanup periods and occupancy times. Our evaluation determined that the occupational radiation exposure resulting from the facility modification represents less than one percent of the present total annual occupational burden at the facility. This small increase in radiation exposure will not affect FPL's ability to maintain individual occupational doses as low as reasonably achievable and within the limits of 10 CFR Part 20. Thus, we conclude that storing additional fuel in the spent fuel storage pool will not result in a significant increase in doses received by occupational workers.

We also evaluated the offsite doses associated with the increased storage capability of the spent fuel storage pool at each facility. Offsite doses are affected primarily by the release of radioactive noble gases from the surface of the spent fuel storage pool. The only significant noble gas released from the surface of the spent fuel pool is krypton 85 since other radioactive noble gases will have decayed to neglibible amounts prior to release from the pool surface. We estimate that an additional 44 curies of krypton 85 will be released each year from the modified storage pool at each facility when it is completely filled with spent fuel assemblies. The release of an additional 44 curies of krypton 85 per year would result in an additional offsite dose of less than 0.1 millirem per year. This dose is insignificant when compared with the approximately 100 millirem per year that an individual receives from natural background radiation. This additional dose contributes insignificantly to the Turkey Point offsite dose and does not jeopardize the ability of FPL to maintain the offsite dose within the limits of 10 CFR Part 20. Thus, we conclude that there will be no significant impact on offsite radiation levels or personnel exposure due to facility operation following installation of the new spent fuel storage racks. For further details on radiation levels following pool modification see the Commission's Environmental Impact Appraisal regarding this action.

Summary

Our evaluation supports the conclusion that the proposed modification to the spent fuel storage pool at each Turkey Point facility is acceptable because: (1) the physical design of the new storage racks will preclude criticality for any moderating condition, (2) the spent fuel storage pools can be adequately cooled, (3) the spent fuel shipping cask handling system will assure that a shipping cask is not moved over stored spent fuel, (4) the offsite radiation levels resulting from a tipped or dropped cask in the storage pool will be acceptable, (5) the structural design and materials of construction are adequate, (6) installation can be accomplished safely, and (7) the increase in onsite and offsite radiation levels will be negligible.

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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: March 17, 1977

ENVIRONMENTAL IMPACT APPRAISAL BY THE

DIVISION OF OPERATING REACTORS

SUPPORTING AMENDMENT NO. 23 TO DPR-31 AND AMENDMENT NO. 22 TO DPR-21

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT PLANT UNITS 3 AND 4

DOCKET NOS. 50-250 AND 50-251

I. Description of Proposed Action

In their submittal of January 28, 1976, supplemented by letters dated May 10, 1976, May 25, 1976, August 3, 1976 and October 15, 1976, Florida Power and Light Company (the licensee) requested approval of the NRC for an amendment to Facility Operating Licenses No. DPR-31 and DPR-41 along with a concomitant change to the Technical Specifications for the Turkey Point Plant Units 3 and 4. This amendment to the license and change to the Technical Specifications concerns the proposed expansion of the capacity of the spent fuel storage pools (SFP) at these units.

The modification evaluated in this environmental impact appraisal is the proposal by the licensee to replace the existing fuel storage racks with closer spaced racks. The rack spacing would be changed from 21 inches on centers in both directions to a nominal 13.66 inches center-to-center spacing. The new racks would increase the storage capacity of the spent fuel pools for each unit from the present 217 fuel assemblies to 621 fuel assemblies.

Unit No. 4 refueled in May 1976 and Unit No. 3 refueled in November 1976. Prior to the Unit 4 refueling, each unit had 100 fuel assemblies stored in their spent fuel pools. By letter dated July 30, 1976, the licensee requested approval to install an additional rack in the Unit 3 SFP to increase the storage capacity temporarily by 18 elements (from 217 to 235 spent fuel assemblies). The additional rack was of the same design as the existing racks (21 inches center-to-center spacing). The Commission approved the installation of the additional rack on September 24, 1976 for a period of one year. The temporary modification allowed the licensee to transfer the spent fuel stored in the Unit 4 pool to the Unit 3 SFP to repair the liner for the Unit 4 SFP. With the spent fuel transferred into the Unit 3 pool from Unit 4 and the spent fuel from the November 1976 refueling, the Unit 3 pool is now full. Following repairs to the Unit 4 pool, the proposed new higher density storage racks will be installed in this pool and the spent fuel assemblies now stored in the Unit 3 pool will be transferred to the Unit 4 pool. When the Unit 3 pool is empty and decontaminated, the licensee will repair the liner in this pool also (tentatively scheduled for early 1978) before installing the proposed new high density storage racks in the Unit 3 SFP. A summary and schedule for the proposed modifications is described in Section 7.0 of the licensee's submittal of April 30, 1976.

Florida Power and Light Company (FPL) is planning to perform an inspection of the Unit 4 reactor pressure vessel in conjunction with the

Spring 1977 refueling and an inspection of the Unit 3 reactor pressure vessel in conjunction with the fall 1977 refueling of Unit 3. These inspections will require unloading the entire cores from both units. However, with the present storage racks, Unit 3 would not be able to off-load a full core. If expansion of the SFP capacity is not approved, and if an alternate storage facility is not located, FPL would have to shutdown Unit 3 by Fall 1978 and Unit 4 by Spring 1979 due to lack of spent fuel storage facilities. The proposed modification would extend the spent fuel storage capability of each pool for an additional eight years. In our evaluation we considered the impacts which may result from storing an additional 404 spent fuel assemblies in each pool for an additional eight years.

The proposed modification will not alter the external physical geometry of the spent fuel pool or require additional modifications to the SFP cooling or purification systems. The proposed modification does not affect in any manner the quantity of uranium fuel utilized in the reactor over the anticipated operating life of the facility and thus in no way affects the generation of spent uranium fuel by the facility. The rate of spent fuel generation and the total quantity of spent fuel generated during the anticipated operating lifetime of the facility and stored in the SFP remains unchanged as a result of the proposed expansion. The modification will increase the number of spent fuel assemblies stored in the SFP and the length of time that some of the fuel assemblies will be stored in the pool.

Currently, spent fuel is not being reprocessed on a commercial basis in the United States. The Nuclear Fuel Services (NFS) plant at West Valley, New York was shut down in 1972 for alterations and expansions; on September 22, 1976, NFS informed the Commission that they were withdrawing from the nuclear fuel reprocessing business. The Allied General Nuclear Services (AGNS) proposed plant is under construction in South Carolina, and this facility is not licensed to operate. The General Electric Company's (GE) Midwest Fuel Recovery Plant (MFRP) in Illinois is in a decommissioned condition. Although no plants are licensed for reprocessing fuel, the GE facility at Morris, Illinois, and the storage pool at West Valley, New York, (on land owned by the State of New York and leased to NFS thru 1980) are licensed to store spent fuel. While the storage pool at West Valley is not full, NFS is presently not accepting any additional spent fuel for storage, even from those power generating facilities that had contractual arrangements with NFS. AGNS has applied for -but has not been granted- a license to receive and store irradiated fuel assemblies in the storage pool at Barnwell prior to a decision on the licensing action relating to the separation facility. Construction of the AGNS receiving storage station itself is complete.

The NRC Staff is preparing a generic environmental impact statement on spent fuel storage of light water power reactor fuel and is expected to complete the final statement by the fall of 1977. The proposed expansion of the SFP capacity at Turkey Point Units Nos. 3 and 4 will afford the licensee operational flexibility by providing storage space for spent fuel discharges through 1983 and 1984 with storage space for an emergency full core discharge.

II. Environmental Impacts of Proposed Action

On September 16, 1975, the Commission announced (40 F.R. 42801) its intent to prepare a generic environmental impact statement on handling the storage of spent fuel from light water reactors. In this notice, the Commission also announced its conclusion that it would not be in the public interest to defer all licensing actions intended to ameliorate a possible shortage of spent fuel storage capacity pending completion of the generic environmental impact statement.

The Commission directed that in the consideration of any such proposed licensing action, the following five specific factors should be applied, balanced, and weighted in the context of the required environmental statement or appraisal.

a. Is it likely that the licensing action here proposed would have a utility that is independent of the utility of other licensing actions designed to ameliorate a possible shortage of spent fuel capacity?

Each of the Turkey Point Units 3 and 4 reactor cores contain 157 fuel assemblies. The facilities achieved initial criticality on October 20, 1972 and on June 11, 1973, respectively. Unit 3 commenced commercial operation on December 14, 1972 followed by Unit 4 on September 7, 1973. The SFPs were designed on the basis that a fuel cycle would be in existence that would only require storage of spent fuel for a year prior to shipment to a reprocessing facility. Therefore, a pool storage capacity for 217 assemblies (1 1/3 cores) for each reactor was considered adequate. This provided for complete unloading of the reactor even if the spent fuel from the previous refueling were in the pool. Typically, Turkey Points Units 3 and 4 replace about one-third of the core at each refueling. With the existing storage racks, full core discharge would no longer be possible after the next refueling of Unit 4 which is scheduled for March 1977. The next refueling of Unit 3 is scheduled for October 1977. If expansion of the SFP capacity is not approved, and if an alternate storage facility is not located, FPL would have to shut down Unit 3 by Fall 1978, and Unit 4 by Spring 1979, due to lack of spent fuel storage facilities.

The proposed licensing action (i.e., installing new racks of a design that permits storing more assemblies in the same space) would provide the licensee with additional operating flexibility which is desirable even if adequate offsite storage facilities hereafter become available to the licensee.

We have concluded that a need for additional spent fuel storage capacity exists at Turkey Point Units 3 and 4 which is independent of the utility of other licensing actions designed to ameliorate a possible shortage of spent fuel capacity.

b. Is it likely that the taking of the action here proposed prior to the prepraration of the generic statement would constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other licensing actions designed to ameliorate a possible shortage of spent fuel storage capacity?

With respect to this proposed licensing action, we have considered commitment of both material and nonmaterial resources. The material resources considered are those to be utilized in the expansion of the SFP.

Under the proposed modification, the present spent fuel storage racks will be replaced by new racks that will increase the storage capacity of the spent fuel pools for both Units 3 and 4 to 621 assemblies.

The augmented fuel assembly storage rack is designed to provide storage locations for up 621 fuel assemblies and is designed to maintain the stored fuel, having a feed enrichment of $\leq$ 3.5 weight percent U-235 in UO_2 or equivalent, in a safe, coolable, and subcritical configuration during normal and abnormal conditions.

The storage rack is a rectangular array composed of ten modules with the spent fuel storage boxes in a 6 x 9 array, and two modules with the storage cells in a 6 x 8 array. Fifteen fuel assembly storage locations are blocked by obstructions protruding from the pool walls.

Each fuel assembly storage module is composed of a rectangular storage cavity fabricated from one-quarter inch thick stainless steel plate, with each cavity capable of accepting one fuel assembly. The fuel assembly storage cavities have lead-in surfaces at the top to provide guidance for insertion of fuel assemblies. The cavities are open at the top and bottom to provide a flow path for convective cooling of spent fuel assemblies through natural circulation. The fuel assembly storage cavities are connected by an eggcrate structure to form modules which limit structural deformations and maintain a nominal center-to-center spacing of 13.66 inches between adjacent storage cavities during design conditions including earthquakes.

The total quantity of stainless to be utilized in the new spent fuel racks is approximately 380,000 pounds. The racks do not use a poison material such as boron impregnated stainless steel, B_4C plates or boral. The amount of stainless steel used annually in the U.S. is about 2.82×10^{11} lbs. The material is readily available in abundant supply. The amount of stainless steel required for fabrication of the new racks is a small amount of this resource consumed annually in the United States. We conclude that the amount of material required for the new racks at Turkey Point Units 3 and 4 is insignificant and does not represent an irreversible commitment of natural resources.

The longer term storage of spent fuel assemblies withdraws the unburned uranium from the fuel cycle for a longer period of time. Its usefulness as a resource in the future, however, is not changed. The provision of longer on-site storage does not result in any cumulative effects due to plant operation since the throughput of materials does not change. Thus the same quantity of uranium will be consumed and likewise the same quantity of radioactive material will have been produced when averaged over the life of the plant. This licensing action would not constitute a commitment of resources that would affect the alternatives available to other nuclear power plants or other actions that might be taken by the industry in the future to alleviate fuel storage problems. No other resources need be allocated because the other design characteristics of the SFP remain unchanged. No additional allocation of land would be made; the land area now used for the SFP would be used more efficiently by reducing the spacings among fuel assemblies.

The increased storage capacity at the Turkey Point Units 3 and 4 spent fuel pools was considered as a nonmaterial resource and was evaluated relative to proposed similar licensing actions within a one year period (the time we estimate is necessary to complete the generic environmental statement) at other nuclear power plants, fuel reprocessing facilities and fuel storage facilities. We have determined that the proposed expansion in the storage capacity of the SFP is only a measure to allow for continued operation and to provide operational flexibility at the facility, and will not affect similar licensing actions at other nuclear power plants.

We conclude that the expansion of the spent fuel pool at the Turkey Point Units 3 and 4 facility prior to the preparation of the generic statement does not constitute a commitment of either material or nonmaterial resources that would tend to significantly foreclose the alternatives available with respect to any other individual licensing actions designed to ameliorate a possible shortage of spent fuel storage capacity.

c. Can the environmental impacts associated with the licensing action here proposed be adequately addressed within the context of the present application without overlooking any cumulative environmental impacts?

The spent fuel pools at Turkey Point Units 3 and 4 were designed to store spent fuel assemblies prior to shipment to a reprocessing facility. These assemblies may be transferred from the reactor core to the SFP during a core refueling, or to allow for inspection and/or modification to core internals (which may require the removal and storage of up to a full core). The assemblies are initially intensely radioactive due to their fission product content and have a high thermal output. They are stored in the SFP to allow for radioactive and thermal decay.

The major portion of decay occurs during the 150 day period following removal from the reactor core. After this period, the assemblies may be withdrawn and placed into a heavily shielded fuel cask for offsite shipment. Space permitting, the assemblies may be stored for an additional period allowing continued fission product decay and thermal cooling prior to shipment.

Since the additional capacity of the SFP is proposed for this site alone and for this licensee only, all the environmental impacts can be assessed within the context of this application. Potential non-radiological and radiological impacts resulting from the fuel rack conversion and subsequent operation of the expanded SFP at this facility were considered by the Staff. No environmental impacts on the environs outside the spent fuel storage building were identified during the proposed construction of the expanded SFP. The impacts within this building are expected to be limited to those normally associated with metal working activities.

No significant environmental impacts, either onsite or offsite, could be identified as resulting from operation of an expanded SFP at this facility.

The only potential offsite nonradiological environmental impact that could arise from this proposed action would be an additional discharge of heat to the recirculating canals used as the source of plant cooling water. Storing spent fuel in the SFP for a longer period of time will add more heat to the SFP water. The spent fuel pool heat exchanger in each unit is cooled by the component cooling water system which in turn is cooled by the intake cooling water system. The expansion of the spent fuel storage in each pit increases the decay heat load from 8.12×10^6 Btu/hour to 8.22×10^6 Btu/hour. Compared to the existing heat load on the component cooling water system and the total heat load rejected to the canal system by the once through circulating water system, the small additional heat load from the SFP cooling system will be negligible.

The potential offsite radiological environmental impact associated with this expansion (resulting from an incremental addition in the long-lived radioactive effluents released from the facility) was evaluated and determined to be environmentally insignificant as addressed below.

The expansion of the SFP will allow spent fuel to be stored for an additional five-year period without shipment offsite and still maintain space to off-load a full core. During the storage of the spent fuel under water, both volatile and nonvolatile radioactive nuclides may be released to the water from the surface of the assemblies or from defects in the fuel cladding. Most of the material released from the surface of the assemblies consists of activated corrosion products such as Co-58, Co-60, Fe-59, and Mn-54 which are not volatile. The radionuclides that might be released to the water through defects in the cladding, such as Cs-134, Cs-137, Sr-89 and Sr-90, are also predominantly nonvolatile. These nonvolatile radioactive nuclides have an insignificant affect on offsite doses. The volatile fission product nuclides of most concern that might be released through defects in the fuel cladding are the noble gases (xenon and krypton), tritium and the iodine isotopes.

The spent fuel pools for Turkey Point Units 3 and 4 are provided with cooling loops which remove residual heat from fuel stored in the SFP. The Spent Fuel Pool Cooling System (SFPCS) is designed to maintain the SFP water temperature less than or equal to 120° F during normal refueling operations and less than or equal to 150°F during full core discharge situations. The SFPCS is described in Section 9.3 of the Final Safety Analysis Report (FSAR). The spent fuel pit cooling loop consists of a pump, heat exchanger, filter, demineralizer, piping and associated valves, and instrumentation. The pump draws water from the pit, circulates it through the heat exchanger and returns it to the pit. Component cooling water cools the heat exchanger. A 100% capacity spare pump which is permanently piped into the spent fuel pit cooling system will be installed for redundancy of active components in the SFPCS. This pump will be capable of operating in place of, but not in parallel with, the original pump. Also, alternate connections will be provided for connecting a temporary pump to the spent fuel pit loop. These pumps will be installed and operable prior to completing the rack augmentation.

The clarity and purity of the spent fuel pool water is maintained by passing approximately 5 percent (100 gpm) of the cooling loop flow through a replaceable cartridge type filter and a flushable 30 cubic feet demineralizer. A skimmer pump, basket type strainer and replaceable cartridge type skimmer filter are also provided as a separate system to remove dust or debris from the surface of the water in each pool. The filters are normally changed on the basis of pressure drop across the elements.

Storing additional spent fuel in the SFP may increase the amount of corrosion and fission product nuclides introduced into the SFP water. The purification system is capable of removing the increased radioactivity to maintain acceptable radiation levels above and in the vicinity of the pool. This could increase the amount of radioactivity accumulated on the filter and demineralizer which are disposed of as solid waste. This increase, if any, should be minor because the fuel will be relatively cool, thermally, and radionuclides will have decayed significantly, so that releases of activity should be very small when compared to the radioactivity of solid wastes normally generated by each reactor.

As a conservative estimate, we have assumed that the amount of solid radwaste may be increased by an additional resin bed a year from each SFP due to the increased operation of the spent fuel pool purification system. In the last four years (1973-1976), Turkey Point shipped an average of 22,000 cubic feet of solidified waste offsite for burial. If the storage of additional spent fuel does increase the amount of solid waste from the purification system by 30 cubic feet per year from each plant, the increase in total waste volume shipped would be less than 1% and would not have any significant additional environmental impact.

The existing stainless steel storage racks weigh about 65,000 pounds. Since spent fuel has been stored in these racks for over a year, it may not be feasible to clean the racks such that they could be released as scrap to an uncontrolled area. The licensee could store the racks for possible future use in an independent fuel storage facility or for double- tiering of spent fuel in a spent fuel pool. The licensee has indicated that the racks will probably be cut up and disposed of as low specific activity waste. The volume of this waste would be in the order of 1000 cubic feet, spread over two or three years. Considering the low activity of this waste and the small percentage it would add to the total waste volume shipped each year, disposal of the existing racks would not have any significant additional environmental impact.

We have estimated the increment in onsite occupational dose resulting from the proposed increase in stored fuel assemblies on the basis of information supplied by the licensee and by utilizing realistic assumptions for occupancy times and for dose rates in the spent fuel pool area from radionuclide concentrations in the SFP water. The spent fuel assemblies themselves contribute a negligible amount to dose rates in the pool area because of the depth of water shielding the fuel. Our analysis indicates that the occupational radiation exposure resulting from the proposed action represents a negligible burden. Based on present and projected operations in the spent fuel pool area, the proposed modification will add less than one percent to the total annual occupational radiation exposure burden at this facility. The small increase in radiation exposure will not affect the licensee's ability to maintain individual occupational doses to as low as is reasonably achievable and within the limits of 10 CFR 20. Thus, we conclude that storing additional fuel in the SFP will not result in any significant increase in doses received by occupational workers.

With respect to gaseous releases from the SFP, the only significant noble gas isotope remaining in the SFP and attributable to storing additional assemblies for a longer period of time would be Krypton-85, since shorter lived noble gases will have decayed to negligible amounts. Based on operating experience for Zircaloy clad fuel (see NUREG-0017), we have assumed that 0.12% of all fuel rods have cladding defects which permit the escape of fission product gases. This value is the weighted average percent defective fuel for nine pressurized water reactors. It is assumed that the fission product gases escape on a relatively linear basis with time. On this basis, we have conservatively estimated that an additional 44 curies per year of Krypton-85 will be released from each pool when the pool is completely filled. The fuel storage pool area is continuously ventilated. If each plant does eventually release an additional 44 curies per year of Kr-85 as a result of the proposed modification, the increase would result in an additional offsite dose of less than 0.1 mrem/year. This dose is insignificant when compared to the approximately 100 mrem/year that an individual receives from natural background radiation. Thus, we conclude that the proposed modification will not have any significant impact on radiation levels or personnel exposure offsite.

Assuming that the spent fuel will be stored onsite for several years (rather than shipped off site after 6 to 12 months storage as originally planned), Iodine-131 releases will not be significantly increased by the expansion of the fuel storage capacity since the Iodine-131 inventory in the fuel will decay to negligible levels between each annual refueling. Storing additional spent fuel assemblies is not expected to increase the bulk water temperature above the 120°F used in the design analysis during normal refuelings or above 150°F during a full core off-load. Since the temperature of the pool water will normally be maintained below 120°F, it is not expected that there will be any significant change in evaporation rates and the release of tritium as a result of the proposed modification.

The Technical Specifications for Turkey Point Units 3 and 4 do not permit a spent fuel cask to be moved to the cask pit area until all fuel in the spent fuel pool has decayed for at least 1000 hours. If a cask tip into the pool were to occur, up to 40 fuel assemblies might be impacted. Assuming that this were to occur when the stored fuel has decayed for 1000 hours, the estimated 0-2 hour thyroid dose at the exclusion area boundary is 24 Rem using conservative assumptions and a 5% χ/Q of 6.9×10^{-5} sec./m^3. The similar dose using realistic assumptions and a 50% χ/Q of 10^{-5} sec./m^3 is <1 Rem. Both doses are within the exposure guidelines of 10 CFR Part 100.

We have considered the potential cumulative environmental impacts associated with the expansion of the SFP and have concluded that they will not result in radioactive effluent releases that significantly affect the quality of the human environmental during either normal operation of the expanded SFP or under postulated fuel handling accident conditions.

d. Have all technical issues which have arisen during the review of this application been resolved within that context?

This impact appraisal and the accompanying safety evaluation report point out that all questions concerning health, safety and environmental concerns have been answered.

e. Would a deferral or severe restriction on this licensing action result in substantial harm to the public interest?

In regard to this licensing action, the staff has considered the following alternatives: (1) shipment of spent fuel to a fuel reprocessing facility, (2) shipment of spent fuel to a separate fuel storage facility, (3) shipment of spent fuel to another reactor site, and (4) ceasing operation of the facility. These alternatives are considered in turn.

The estimated construction cost for repairs to the existing liners and for the SFP facility modification for Units 3 and 4, including liner, new rack modules, the temporary rack, construction materials and labor is $12,593,000. Of this amount, approximately $3 million per unit is for the new racks. While this is costly, the alternatives are more costly.

(1) As discussed earlier, none of the three commercial reprocessing facilities in the U.S. are currently operating. The General Electric Company's Midwest Fuel Recovery Plant (MFRP) at Morris, Illinois is in a decommissioned condition. On September 22, 1976, Nuclear Fuel Services, Inc. (NFS) informed the Nuclear Regulatory Commission that they were "withdrawing from the nuclear fuel reprocessing business". In their letter to NRC and letters to utilities with whom NFS had contracts for storage and reprocessing of spent fuel, NFS discussed the reasons for their decision. For several years, NFS had been seeking the licensing approval of the Commission for modifications of the reprocessing plant at West Valley to increase its operating capacity and for operation of the Modified facility. When the Commission determined that such approval would require both a construction permit and an operating license amendment, NFS filed an application for amendments to Provisional Operating License No. CSF-1, which was docketed on December 17, 1973. During the course of review of this application, new regulatory requirements were

periodically identified; for example, in April 1976, the NRC staff concluded that seismic requirements would have to be significantly increased. NFS estimated that the new requirements would increase the cost of the project from the $15 million originally estimated to over $600 million and delay resumption of reprocessing until 1988. On the above basis, NFS concluded "that the project is commercially impractical in light of regulatory requirements that have arisen since the project was initiated". The Allied General Nuclear Services (AGNS) reprocessing plant received a construction permit on December 18, 1970. In October 1973, AGNS applied for an operating license for the separation facility; construction of which is essentially complete. On July 3, 1974, AGNS applied for a materials license to receive and store up to 400 MTU in spent fuel in the on-site storage pool, on which construction has been completed. Hearings are expected to be completed on the materials license application by mid 1977. However, the AGNS separations plant will not be licensed until the issues presently being considered in the GESMO proceedings are resolved and these proceedings are completed. Therefore, shipment of spent fuel to a reprocessing plant is not an available alternative for several more years.

(2) An alternative to expansion of onsite spent fuel pool storage is the construction of new "independent spent fuel storage installations" (ISFSI). Such installations could provide storage space

in excess of 1000 MTU of spent fuel. This is far greater than the capacities of onsite storage pools. An ISFSI could be designed using dry storage technology. Fuel storage pools at GE Morris and NFS are functioning as ISFSIs although this was not the original design intent. Likewise, if the receiving and storage station at AGNS is licensed to accept spent fuel, it would be functioning as an ISFSI until the separations facility is licensed to operate. The license for the GE facility at Morris, Ill was amended on December 3, 1975 to increase the storage capacity to about 750 MTU; approximately 200 MTU is now stored in the pool. The NFS facility has capacity for about 260 MTU, with approximately 170 MTU presently stored in the pool. However, since NFS withdrew from the fuel reprocessing business, they are not at present accepting additional spent fuel for storage even from those reactor facilities with which they had contracts. The AGNS will have capacity for about 400 MTU if they are licensed to receive spent fuel.

With respect to construction of new ISFSIs, Regulatory Guide 3.24, "Guidance on the License Application, Siting, Design, and Plant Protection for an Independent Spent Fuel Storage Installation" issued in December 1974, recognizes the possible need for ISFSIs and provides recommended criteria and requirements for water-cooled ISFSIs. Pertinent sections of 10 CFR Part 19, 20, 30, 40, 51, 70, 71 and 73 would also apply.

It is estimated that at least five years would be required for completion of an independent fuel storage facility. This estimate assumes one year for preliminary design; one year for preparation of the license application, Environmental Report, and licensing review in parallel with one year for detail design; two and one-half years for construction and receipt of an operating license; and one-half year for plant and equipment testing and startup.

Industry proposals for independent spent fuel storage facilities are scarce to date. In late 1974, E. R. Johnson Associates, Inc. and Merrill Lynch, Pierce, Fenner and Smith, Inc. issued a series of joint proposals to a number of electric utility companies having nuclear plants in operation or contemplated for operation, offering to provide independent storage services for spent nuclear fuel. A paper on this proposed project was presented at the American Nuclear Society meeting in November 1975. The Commission has not received any license requests for facilities conceived and designed only to store spent fuel. In 1974, E. R. Johnson Associates estimated their construction cost at approximately $9000 per spent fuel assembly. At this rate, it would cost the licensee over $7,000,000 to store the additional 808 spent fuel assemblies that the proposed modification will accommodate, plus there would be additional costs for shipment and safeguarding the fuel. An independent spent fuel storage installation is not a viable alternative based on cost or availability in time to meet the licensee's needs. It is also unlikely that the total environmental impacts of constructing an independent facility and shipment of spent fuel would be less than the minor impacts associated with the proposed action.

(3) The licensee has considered shipment of the spent fuel from Turkey Point Units 3 and 4 to the St. Lucie facility, another PWR type reactor in the Florida Power and Light Company (FPL) system. However, the Turkey Point fuel will not physically fit in the St. Lucie spent fuel storage racks. According to a survey conducted and documented by the Energy Research and Development Agency, up to 46 percent of the operating nuclear power plants will lose the ability to refuel during the period 1975-1984 without additional spent fuel storage pool expansions or access to offsite storage facilities. Thus, the licensee cannot assuredly rely on any other power facility to provide additional storage capability except on a short-term emergency basis.

(4) Storage in the existing racks is possible but only for a short period of time. The spent fuel pool of Unit 3 is full from three refuelings of Unit 3 and two refuelings from Unit 4. If expansion of the SFP capacity is not approved, and if an alternate storage facility is not located, FPL would have to shutdown Unit 3 by the fall of

1978 and Unit 4 by the spring of 1979 due to a lack of spent fuel storage facilities. In order to perform a reactor pressure vessel inspection, which is planned for Unit 4 during the spring 1977 refueling, it is necessary that the proposed expansion of spent fuel storage capacity be completed by March 1977.

Termination of reactor operations would cost FPL customers an additional $365,000/day/unit in replacement fuel cost to generate the the same energy with FPL fossil (oil) generation. In order to purchase the power from outside of FPL's generating system, it would cost about $430,000/day/unit. Besides being an unacceptable alternative, within a month the cost of replacement power would exceed the cost of the proposed action.

In summary, the alternatives (1) to (3) described above do not offer the operating flexibility of the proposed action nor could they be completed as rapidly as the proposed action. The alternatives of shipping the spent fuel to a reprocessing facility, an independent storage facility or to another reactor would be more expensive than the proposed action and might preempt storage space needed by another utility. The alternative of ceasing operation of the facility also would be more expensive than the proposed action because of the need to provide replacement power. In addition to the economic advantages of the proposed action, we have determined that the expansion of the SFP would have a negligible environmental impact and would result in substantial harm to the public interest.

III. Basis and Conclusion for not Preparing an Environmental Impact Statement

We have reviewed this proposed facility modification relative to the requirements set forth in 10 CFR Part 51 and the Council of Environmental Quality's Guidelines, 40 CFR 1500.6 and have applied, weighted, and balanced the five factors specified by the Nuclear Regulatory Commission in 40 FR 42801. We have determined that the license amendment will not significantly affect the quality of the human environment. Therefore, the Commission has found that an environemtnal impact statement need not be prepared, and that pursuant to 10 CFR 51.5 (c), the issuance of a negative declaration to this effect is appropriate.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKETS NOS. 50-250 AND 50-251

FLORIDA POWER AND LIGHT COMPANY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY OPERATING LICENSES

AND NEGATIVE DECLARATION

The Nuclear Regulatory Commission (the Commission) has issued Amendments Nos. 23 and 22 to Facility Operating Licenses Nos. DPR-31 and DPR-41, respectively, issued to Florida Power and Light Company, which revised the licenses and their appended Technical Specifications for operation of the Turkey Point Nuclear Generating Units Nos. 3 and 4 (the facilities) located in Dade County, Florida. The amendments are effective as of the date of issuance.

The amendments authorized expansion of the spent fuel storage pool capacity by replacing the existing spent fuel storage racks, which have a capacity for 235 fuel assemblies at Unit No. 3 and 217 at Unit No. 4, with new racks which have a capacity for 621 fuel assemblies per Unit.

The application for the amendments complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Notice of Proposed Issuance of Amendments to Facility Operating Licenses in connection with this action was published in the FEDERAL REGISTER on March 25, 1976 (41 F.R. 19363). No request for a hearing or petition for leave to intervene was filed following notice of the proposed action.

The Commission has prepared an environmental impact appraisal in connection with issuance of the amendments and has concluded that an environmental impact statement for this particular action is not warranted because there will be no significant environmental impact attributable to the proposed action.

For further details with respect to this action, see (1) the application for amendments dated January 28, 1976, and supplements thereto dated April 30, May 10 and 25, June 1, August 3, October 15 and 27, 1976, and February 10 and 16, 1977, (2) Amendments Nos. 23 and 22 to Licenses Nos. DPR-31 and DPR-41, (3) the Commission's related Safety Evaluation, and (4) the Commission's Environmental Impact Appraisal. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street N. W., Washington, D. C. and at the Environmental & Urban Affairs Library, Florida International University, Miami, Florida 33199.

A copy of items (2), (3), and (4) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, ATTENTION: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland this 17 day of March 1977.

FOR THE NUCLEAR REGULATORY COMMISSION

George Lear

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors