UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FLORIDA POWER CORPORATION
CITY OF ALACHUA
CITY OF BUSHNELL
CITY OF GAINESVILLE
CITY OF KISSIMMEE
CITY OF LEESBURG
CITY OF NEW SMYRNA BEACH AND UTILITIES COMMISSION, CITY OF NEW SMYRNA BEACH
CITY OF OCALA
ORLANDO UTILITIES COMMISSION AND CITY OF ORLANDO
SEMINOLE ELECTRIC COOPERATIVE, INC.
CITY OF TALLAHASSEE

DOCKET NO. 50-302

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 151
License No. DPR-72

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

   A. The application for amendment by Florida Power Corporation, et al. (the licensee) dated January 26, 1995, as supplemented March 9 and May 24, 1995, 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 paragraph 2.C.(2) of Facility Operating License No. DPR-72 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, asrevised through Amendment No. 151, are hereby incorporated in the license. Florida Power Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Bart C. Buckley for

David B. Matthews, Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 15, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 151

FACILITY OPERATING LICENSE NO. DPR-72

DOCKET NO. 50-302

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Remove	Insert
3.7-30	3.7-30
3.7-31	3.7-31
3.7-32	3.7-32
3.7-33	3.7-33
------	3.7-33A
4.0-1	4.0-1
4.0-2	4.0-2
B 3.7-72	B 3.7-72
B 3.7-73	B 3.7-73
B 3.7-74	B 3.7-74
B 3.7-75	B 3.7-75
B 3.7-76	B 3.7-76

3.7 PLANT SYSTEMS

3.7.15 Spent Fuel Assembly Storage

LCO 3.7.15 The combination of initial enrichment and burnup of each spent fuel assembly stored in Storage Pool A and Storage Pool B shall be within the acceptable region of Figure 3.7.15-1, Figure 3.7.15-2, Figure 3.7.15-3, or stored in accordance with the FSAR.

APPLICABILITY: Whenever any fuel assembly is stored in Storage Pool A or Storage Pool B of the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Requirements of the LCO not met.	A.1	--------NOTE-------- LCO 3.0.3 is not applicable. -------------------- Initiate action to move the noncomplying fuel assembly to an acceptable configuration.	 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.15-1, Figure 3.7.15-2, Figure 3.7.15-3, or in accordance with the FSAR.	Prior to storing the fuel assembly in Storage Pool A or Storage Pool B.

MINIMUM BURNUP REQUIRED FOR
"A" POOL STORAGE

Minimum Burnup vs Initial Nominal Enrichment

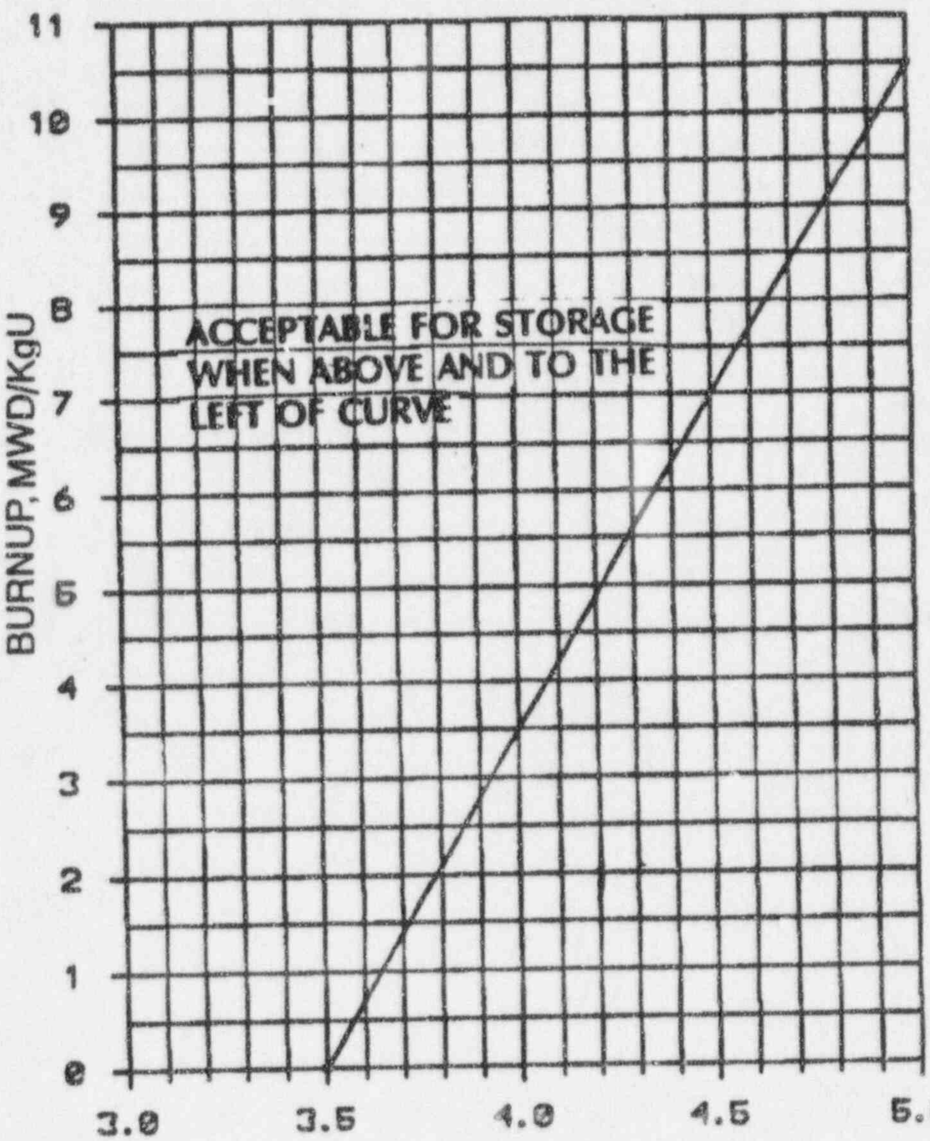

Figure 3.7.15-1 (page 1 of 3)
Burnup versus Enrichment Curve for
Spent Fuel Storage Pool A

MINIMUM BURNUP REQUIRED FOR
REGION 1 OF "B" POOL

Minimum Burnup vs Initial Nominal Enrichment

Burned Fuel in checkerboard Configuration with 5.0 wt% Fresh Fuel

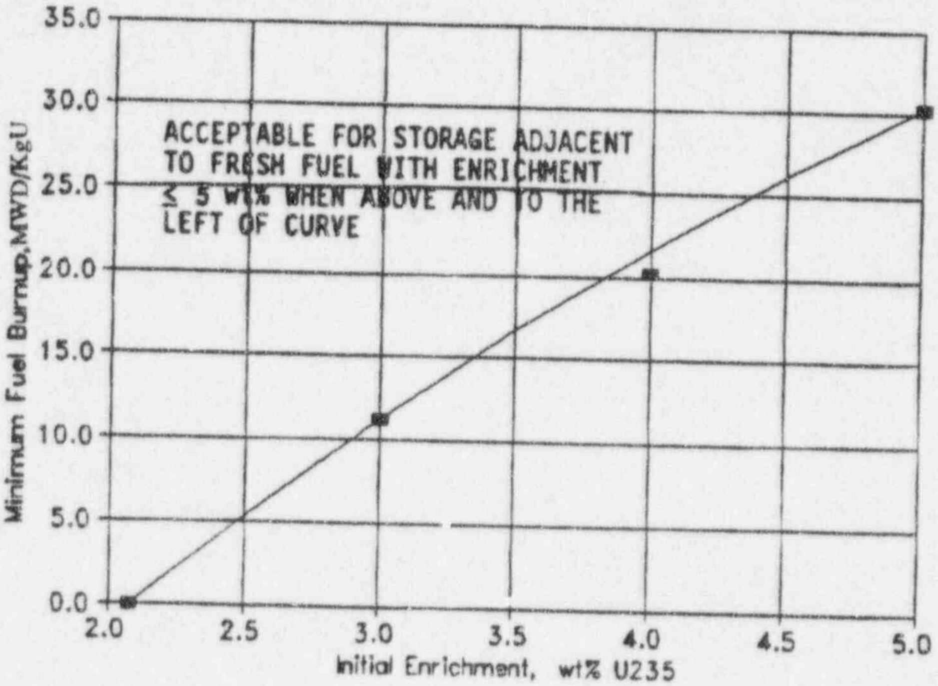

Figure 3.7.15-2 (page 2 of 3)
Burnup versus Enrichment Curve for
Spent Fuel Storage Pool B, Region 1

MINIMUM BURNUP REQUIRED FOR
REGION 2 OF "B" POOL

Minimum Burnup vs Initial Nominal Enrichment

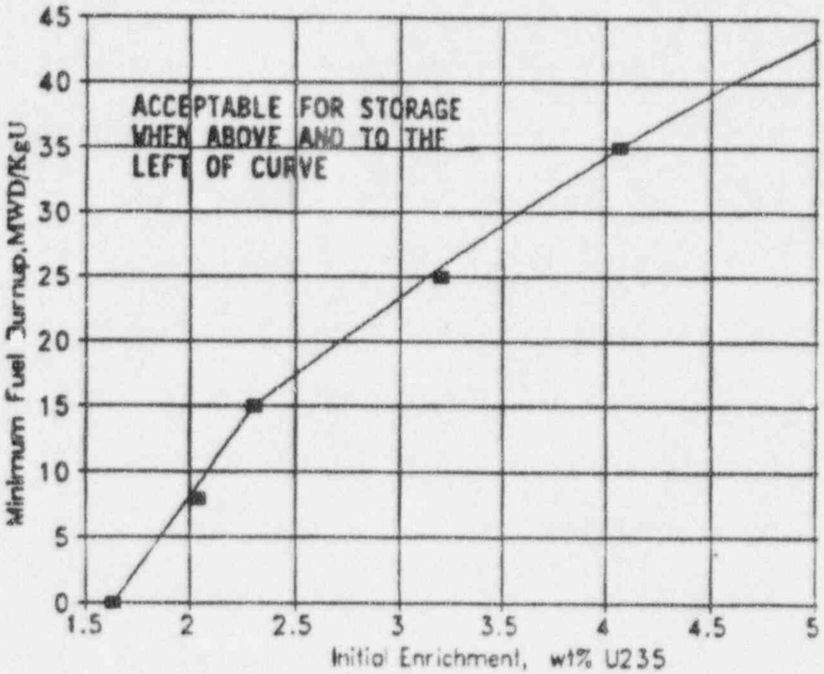

Figure 3.7.15-3 (page 3 of 3)
Burnup versus Enrichment Curve for
Spent Fuel Storage Pool B, Region 2

4.0 DESIGN FEATURES

4.1 Site

The 4,738 acre site is characterized by a 4,400 foot minimum exclusion radius centered on the Reactor Building; isolation from nearby population centers; sound foundation for structures; an abundant supply of cooling water; an ample supply of emergency power; and favorable conditions of hydrology, geology, seismology, and meteorology.

4.2 Reactor Core

4.2.1 Fuel Assemblies

The reactor shall contain 177 fuel assemblies. Each fuel assembly shall consist of a matrix of Zircaloy-4 clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide (UO_2) as fuel material, with a maximum enrichment of 5.0 weight percent U-235. Limited substitutions of stainless steel filler rods for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases. Each fuel rod shall have a nominal active fuel length of 144 inches and shall contain a maximum total weight of 2253 grams uranium.

4.2.2 CONTROL RODS

The reactor core shall contain 60 safety and regulating (including extended life CONTROL RODS) and 8 AXIAL POWER SHAPING (APSR) rods. Except for the extended life CONTROL RODS, the CONTROL RODS shall contain a nominal 134 inches of absorber material. The extended life CONTROL RODS shall contain a nominal 139 inches of absorber material. The nominal values of absorber material shall be 80 percent silver, 15 percent indium, and 5 percent cadmium. Except for extended life CONTROL RODS, all CONTROL RODS shall be clad with stainless steel tubing. The extended life CONTROL RODS shall be clad with Inconel. The APSRs shall contain a nominal 63 inches of absorber material at their lower ends. The absorber material for the APSRs shall be 100 % Inconel.

(continued)

4.0 DESIGN FEATURES (continued)

4.3 Fuel Storage

4.3.1 Criticality

4.3.1.1 The spent fuel storage racks are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;

b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.6 of the FSAR;

c. A nominal 10.6 inch center to center distance between fuel assemblies placed in Region 1 of the B pool;

d. A nominal 9.17 inch center to center distance between fuel assemblies placed in Region 2 of the B pool; and

e. A nominal 10.5 inch center to center distance between fuel assemblies placed in the A pool.

4.3.1.2 The new fuel storage racks are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;

b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.6 of the FSAR;

c. $k_{eff} \leq 0.98$ if moderated by aqueous foam, which includes an allowance for uncertainties as described in Section 9.6 of the FSAR; and

d. A nominal 21.125 inch center to center distance between fuel assemblies placed in the storage racks.

(continued)

B 3.7 PLANT SYSTEMS

B 3.7.15 Spent Fuel Assembly Storage

BASES

BACKGROUND

This document describes the Bases for the Spent Fuel Assembly Storage which imposes storage requirements upon irradiated and unirradiated fuel assemblies stored in the fuel storage pools containing high density racks. The storage areas, which are part of the Spent Fuel System, governed by this Specification are:

a. Fuel storage pool "A" and
b. Fuel storage pool "B".

In general, the function of the storage racks is to support and protect new and spent fuel from the time it is placed in the storage area until it is shipped offsite.

Spent fuel is stored underwater in either fuel storage pool A or B. Only fuel pool A has the capability to store failed fuel in containers. Spent fuel pool A features high density poison storage racks with a 10 1/2 inch center-to-center distance capable of storing 542 assemblies. Fuel pool A is capable of storing fuel with enrichments up to 5.0 weight percent U-235 (Ref. 1) without exceeding the criticality criteria of Reference 3 providing the fuel has sufficient burnup.

Spent fuel pool B also contains high density racks separated into 2 regions. The racks in Region 1 have a 10.60 inch center-to-center spacing capable of storing 174 assemblies. The high density racks in Region 2 have 9.17 inch center-to-center distance capable of storing 641 assemblies. Fuel pool B is capable of storing fuel with enrichments up to 5.0 weight percent U-235 (Ref. 2) without exceeding the criticality criteria of Reference 3, providing the fuel has sufficient burnup and required storage configuration.

It should be noted that the maximum enrichment limits are actually nominal values. The tolerance of fuel supplied by DOE is ± 0.013 weight percent. Thus, it is possible to have fuel with an initial enrichment slightly in excess of the stated limit. This is accounted for in the criticality analysis and is therefore acceptable.

(continued)

BASES

BACKGROUND (continued)

Both of the spent fuel pools are constructed of reinforced concrete and lined with stainless steel plate. They are located in the fuel handling area of the auxiliary building (Ref. 2).

New fuel storage requirements are addressed in Section 4.0, "Design Features".

APPLICABLE SAFETY ANALYSES

The function of the spent fuel storage racks are to support and protect spent fuel assemblies from the time they are placed in the pool until they are shipped offsite. The spent fuel assembly storage LCO was derived from the need to establish limiting conditions on fuel storage to assure sufficient safety margin exists to prevent inadvertent criticality. The spent fuel assemblies are stored entirely underwater in a configuration that has been shown to result in a reactivity of less than 0.95 under worse case conditions (Ref. 1 and 2). The spent fuel assembly enrichment requirements in this LCO are required to ensure inadvertent criticality does not occur in the spent fuel pool.

Inadvertent criticality within the fuel storage area could result in offsite radiation doses exceeding 10 CFR 100 limits.

The spent fuel assembly storage satisfies Criterion 2 of the NRC Policy Statement.

LCO

Limits on the irradiated fuel assembly storage in high density racks were established to ensure the assumptions of the criticality safety analysis of the spent fuel pools is maintained.

Limits on initial fuel enrichment and burnup for spent fuel stored in pool A have been established. Two limits are defined:

1. Initial fuel enrichment must be less than or equal to 5.0 weight percent U-235, and

(continued)

BASES

LCO (continued)

2. For spent fuel with initial enrichment less than or equal to 5.0 weight percent and greater than or equal to 3.5 weight percent, fuel burnup must be within the limits specified in Figure 3.7.15-1. (Figure 3.7.15-1 presents required fuel assembly burnup as a function of initial enrichment.)

Fuel enrichment limits are based on avoiding inadvertent criticality in the spent fuel pool. The CR-3 spent fuel storage system was initially designed to a maximum enrichment of 3.5 weight percent. Enrichments of up to 5.0 weight percent are permissible for storage in spent fuel pool A as long as the fuel burnup is sufficient to limit the worst case reactivity in the storage pool to less than 0.95. Fuel burnup reduces the reactivity of the fuel due to the accumulation of fission product poisons. Reference 1 documents that the required burnup varies linearly as a function of enrichment with 10500 megawatt days per metric ton uranium (Mwd/mtU) required for fuel with 5.0 weight percent enrichment and 0 burnup required for 3.5 weight percent enriched fuel.

Similar types of restrictions have been established for Pool B.

1. Initial fuel enrichment must be ≤ 5.0 weight percent U-235,

2. For Region 1, fuel with initial enrichment ≤ 5.0 weight percent and ≥ 2.08 weight percent fuel burnup must be within the limits specified in Figure 3.7.15-2 and arranged in a required checkerboard configuration with new fuel or burned fuel of ≤ 5.0 weight percent, and

3. For spent fuel with initial enrichment ≤ 5.0 weight percent and ≥ 1.63 weight percent in Region 2, fuel burnup must be within the limits specified in Figure 3.7.15-3. (Figure 3.7.15-3 presents required fuel assembly burnup as a function of initial enrichment.)

(continued)

BASES

LCO (continued)

The LCO allows compensatory loading techniques, specified in the FSAR and applicable fuel handling procedures, as an alternative to storing fuel assemblies in accordance with Figures 3.7.15-1, 3.7.15-2 and 3.7.15-3. This is acceptable since these loading patterns assure the same degree of subcriticality within the pool.

APPLICABILITY

In general, limiting fuel enrichment of stored fuel prevents inadvertent criticality in the storage pools. Inadvertent criticality is dependent on whether fuel is stored in the pools and is completely independent of plant MODE.

Therefore, this LCO is applicable whenever any fuel assembly is stored in high density fuel storage locations.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating LCO 3.0.3 does not apply. Since the design basis accident of concern in this Specification is an inadvertent criticality, and since the possibility or consequences of this event are independent of plant MODE, there is no reason to shutdown the plant if the LCO or Required Actions cannot be met.

When the configuration of fuel assemblies stored in the spent fuel pool is not in accordance with Figure 3.7.15-1, Figure 3.7.15-2, Figure 3.7.15-3, or the FSAR, immediate action must be taken to make the necessary fuel assembly movement(s) to bring the configuration into compliance. The Immediate Completion Time underscores the necessity of restoring spent fuel pool irradiated fuel loading to within the initial assumptions of the criticality analysis.

The ACTIONS do not specify a time limit for completing movement of the affected fuel assemblies to their correct location. This is not meant to allow an unnecessary delay in resolution, but is a reflection of the fact that the complexity of the corrective actions is unknown.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1

Verification by administrative means that initial enrichment and burnup of fuel assemblies in accordance with Figure 3.7.15-1, Figure 3.7.15-2, and Figure 3.7.15-3 is required prior to storage of spent fuel in storage pool A or pool B, (as applicable). This surveillance ensures that fuel enrichment limits, as specified in the criticality safety analysis (Ref. 2), are not exceeded. The surveillance Frequency (prior to storage in high density region of the fuel storage pool) is appropriate since the initial fuel enrichment and burnup cannot change after removal from the core.

REFERENCES

1. Criticality Safety Evaluation of the Pool A Spent Fuel Storage Racks in Crystal River Unit 3 with Fuel of 5.0% Enrichment, S.E. Turner, Holtec Report HI 931111, December 1993.

2. Crystal River Unit 3 Spent Fuel Storage Pool B Criticality Analysis, W.A. Wittkopf, L.A. Hassler, B&W Fuel Company, BAW-2209P, October 1993.

3. NUREG 0800, Standard Review Plan, Section 9.1.1 and 9.1.2, Rev.2, July 1981.

4. 10 CFR 100.

5. CR-3 FSAR, Section 9.6, Revision 11.