DMB 0/6

NOV 8 1984

Docket No. 50-302

Mr. Walter S. Wilgus
Vice President, Nuclear Operations
Florida Power Corporation
ATTN: Manager, Nuclear Licensing
& Fuel Management
P. O. Box 14042; M.A.C. H-2
St. Petersburg, Florida 33733

Dear Mr. Wilgus:

The Commission has issued the enclosed Amendment No. 72 to Facility Operating License No. DPR-72 for the Crystal River Unit No. 3 Nuclear Generating Plant (CR-3). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated February 24, 1984. These changes would allow increasing the U-235 enrichment limit in the high density fuel storage racks.

A copy of our Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's next Monthly Federal Register Notice.

Sincerely,

"ORIGINAL SIGNED BY
JOHN F. STOLZ"

John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing

Enclosures:
1. Amendment No. 72 to DPR-72
2. Safety Evaluation

cc w/enclosures:
See next page

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cc w/enclosure(s):

Mr. Wilbur Langely, Chairman
Board of County Commissioners
Citrus County
Inverness, Florida 36250

Regional Radiation Representative
EPA Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Mr. R. W. Neiser, Senior
Vice President and General
Counsel
Florida Power Corporation
P. O. Box 14042
St. Petersburg, Florida 33733

Administrator
Department of Environmental Regulation
Power Plant Siting Section
State of Florida
2600 Blair Stone Road
Tallahassee, Florida 32301

Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, Florida 32304

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission, Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Mr. Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
Suite 220, 7910 Woodmont Avenue
Bethesda, Maryland 20814

Mr. Tom Stetka, Resident Inspector
U.S. Nuclear Regulatory Commission
Route #3, Box 717
Crystal River, Florida 32629

Nuclear Plant Manager
Florida Power Corporation
P. O. Box 219
Crystal River, Florida 32629

Bureau of Intergovernmental Relations
660 Apalachee Parkway
Tallahassee, Florida 32304

Ulray Clark, Administrator
Radiological Health Services
Department of Health and
Rehabilitative Services
1323 Winewood Blvd.
Tallahassee, Florida 32301

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

FLORIDA POWER CORPORATION
CITY OF ALACHUA
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 THE CITY OF ORLANDO
SEBRING UTILITIES COMMISSION
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. 72
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 licensees) dated February 24, 1984, 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 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, as revised through Amendment No. 72 , 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.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 8, 1984

ATTACHMENT TO LICENSE AMENDMENT NO. 72

FACILITY OPERATING LICENSE NO. DPR-72

DOCKET NO. 50-302

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed 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.

Pages
5-4
5-5

DESIGN PRESSURE AND TEMPERATURE

5.2.2 The reactor containment building is designed and shall be maintained for a maximum internal pressure of 55 psig and a temperature of 281°F.

5.3 REACTOR CORE

FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 177 fuel assemblies with each fuel assembly containing 208 fuel rods clad with Zircaloy - 4. Each fuel rod shall have a nominal active fuel length of 144 inches and contain a maximum total weight of 2253 grams uranium. The initial core loading shall have a maximum enrichment of 2.83 weight percent U-235. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 3.50 weight percent U-235.

CONTROL RODS

5.3.2 The reactor core shall contain 61 safety and regulating and 8 axial power shaping (ASPR) control rods. The safety and regulating control rods shall contain a nominal .134 inches of absorber material. The APSR's shall contain a nominal 36 inches of absorber material at their lower ends. The nominal values of absorber material shall be 80 percent silver, 15 percent indium and 5 percent cadmium. All control rods shall be clad with stainless steel tubing.

5.4 REACTOR COOLANT SYSTEM

DESIGN PRESSURE AND TEMPERATURE

5.4.1 The reactor coolant system is designed and shall be maintained:

a. In accordance with the code requirements specified in Section 4.1.2 of the FSAR, with allowance for normal degradation pursuant to applicable Surveillance Requirements.

b. For a pressure of 2500 psig, and

c. For a temperature of 650°F, except for the pressurizer and pressurizer surge line, which is 670°F.

VOLUME

5.4.2 The total water and steam volume of the reactor coolant system is 12,180 ± 200 cubic feet at a nominal T_{avg} of 525°F.

5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown on Figure 5.1-1.

5.6 FUEL STORAGE

CRITICALITY

5.6.1 The new fuel storage racks and spent fuel storage racks in pool "B" are designed and shall be maintained with a nominal 21-1/8 inch center-to-center distance between fuel assemblies placed in the storage racks. The high density spent fuel storage racks in pool "A" are designed and shall be maintained with a nominal 10.5 inch center-to-center distance between fuel assemblies placed in the storage racks. All of these rack designs ensure a keff equivalent to ≤0.95 with the storage pool filled with unborated water. The keff of ≤0.95 includes a conservative allowance of >1% Δk/k for uncertainties. In addition, fuel in the new and spent fuel storage racks shall have a U-235 loading of ≤46.14 grams of U-235 per axial centimeter of fuel assembly (≤an enrichment of 3.5 weight percent U-235).

DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 138 feet 4 inches.

CAPACITY

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1153 fuel assemblies and 6 failed fuel containers.

5.7 COMPONENT CYCLIC OR TRANSIENT LIMIT

5.7.1 The components identified in Table 5.7-1 are designed and shall be maintained within the cyclic or transient limit of Table 5.7-1.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 72 TO FACILITY OPERATING LICENSE NO. DPR-72

FLORIDA POWER CORPORATION, ET AL.

CRYSTAL RIVER UNIT NO. 3 NUCLEAR GENERATING PLANT

DOCKET NO. 50-302

INTRODUCTION

By letter dated February 24, 1984, the Florida Power Corporation (the licensee) made application to increase the permitted enrichment for fuel to be stored in the high denisty racks in pool "A" at the Crystal River Unit 3 facility. The original analyses for these racks had been performed under the assumption of 3.3 weight percent U-235 enrichment fuel assemblies. The present application would increase that value to 3.5 percent. The analysis for the fuel racks in pool "B" had originally been done for 3.5 weight percent U-235 enrichment fuel assemblies. In support of the application, the licensee submitted a report, "Criticality Safety Analysis of the Crystal River Spent Fuel Storage Rack", SS-152, prepared by Southern Science.

EVALUATION

The calculation was performed with the KENO-IV code with cross-section preparation by the AMPX code package. This is the most widely used calculation method and has been extensively verified against critical experiments. In particular, Southern Science has performed such verification. We conclude that the calculation method used is acceptable.

A nominal design case was calculated and the uncertainties to be applied to the nominal value of k-effective were investigated. The uncertainties were obtained by using diffusion theory to obtain the effect of small changes in the parameters of the nominal calculation. This is a common industry practice and is acceptable.

The uncertainties treated included those due to variations in boron loading in the absorber plates, absorber plate width variations, storage cell lattice pitch, stainless steel thickness, and fuel enrichment and density. The effect of these variations when combined at the 95/95 level is less than 0.01 in k-effective change. In addition, an uncertainty in the verification analysis and a statistical uncertainty in the nominal calculation (due to the use of the Monte-Carlo method) were added to the mechanical uncertainties to obtain a total uncertainty of 0.011 in the k-effective value. Adding this value to the nominal value results in a k-effective value of 0.946 including all uncertainties. This meets our acceptance criterion of 0.95 for this quantity and is acceptable.

The effect of eccentric positioning of fuel assemblies in the racks and loss of pool cooling with consequent increase in pool temperature has been analyzed. Both these abnormal conditions lead to a reduction in pool reactivity. The effect of dropping an assembly on top of the racks or beside the racks has been analyzed. In neither case can the assembly be closer than 6 inches to another assembly. An infinite array of assemblies having 6-inch face-to-face separation (without intervening poison) has a k_{eff} less than the nominal value for the racks. We conclude that credible accident configurations will not lead to reduction in pool margin to criticality.

On the basis of our review, which is described above, we conclude that fuel of the B&W 15x15 design having enrichment no greater than 3.5 weight percent U-235 may be safely stored in the high density racks in pool "A" at the Crystal River Unit 3 facility. We further conclude that the revised Technical Specifications 5.3.1 and 5.6.1 are acceptable.

ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. We have determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

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

Dated: November 8, 1984

Principal Contributors:
W. Brooks, H. Silver