

Florida Power

CORPORATION

Crystal River Unit 3
Docket No. 50-302

January 26, 1995
3F0195-05

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Subject: Technical Specification Change Request No. 201
Fuel Enrichment Increase

Dear Sir:

Florida Power Corporation (FPC) is submitting Technical Specification Change Request No. 201 requesting an increase in the allowable nominal fuel enrichment from 4.2 to 5.0 weight percent for reload fuel assemblies.

The purpose of limiting allowable fuel enrichment of assemblies stored in the dry racks is to assure sufficient safety margin exists to prevent inadvertent criticality. This is done by assuring a K_{eff} equal to or less than 0.95 is maintained. The analysis in Attachment 1 indicates that storage of 5.0 weight percent (maximum) enriched fuel in the dry (new fuel) storage racks will not cause K_{eff} to exceed 0.95. The analysis provided in Attachments 2 and 3 indicates that the storage of fuel greater than 4.5 weight percent up to 5.0 weight percent initial enriched fuel in storage pools A and B will not cause K_{eff} to exceed 0.95. Each analysis includes margins for uncertainty in reactivity calculations and in mechanical tolerances.

Attachment 3 contains proprietary information. FPC is therefore submitting an affidavit in accordance with 10 CFR 2.790, from B & W Fuel Company requesting Attachment 3, BAW-2209P, "Crystal River Unit 3 Spent Fuel Storage Pool B Criticality Analysis," dated October 1993 be withheld from public disclosure.

CRYSTAL RIVER ENERGY COMPLEX: 15760 W Power Line Street • Crystal River, Florida 34428-6708 • (904) 795-6486

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PDR ADDCK 05000302
PDR

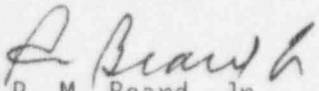
A Florida Progress Company

Change At Fuel w/out Prop APO!
N.C. PDR

U. S. Nuclear Regulatory Commission
3F0195-05
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Pursuant to 10 CFR 50.91(a)(1), FPC is providing our determination of significant hazards consideration which was performed using the standards in 10 CFR 50.92. Also included with this letter are the proposed replacement pages for Appendix A to CR-3's Technical Specifications. Bases pages are provided for information only.

Sincerely,


P. M. Beard, Jr.
Senior Vice President
Nuclear Operations

PMB/JBC

Attachments

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

IN THE MATTER)
)
FLORIDA POWER CORPORATION) DOCKET NO. 50-502

CERTIFICATE OF SERVICE

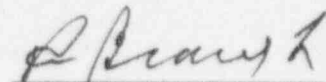
P. M. Beard, Jr. deposes and says that the following has been served on the Designated State Representative and Chief Executive of Citrus County, Florida, by deposit in the United States mail, addressed as follows:

Chairman,
Board of County Commissioners
of Citrus County
Citrus County Courthouse
Inverness, FL 34450

Administrator,
Radiological Health Services
Department of Health and
Rehabilitative Services
1323 Winewood Blvd.
Tallahassee, FL 32301

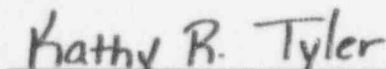
A copy of Technical Specification Change Request No. 201, Revision 0.

FLORIDA POWER CORPORATION



P.M. Beard, Jr.
Senior Vice President
Nuclear Operations

SWORN TO AND SUBSCRIBED BEFORE ME THIS 26th DAY OF JANUARY 1995.


Notary Public (print)


Notary Public (signature)

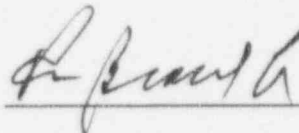
Notary Public, State of Florida at Large
My Commission Expires: May 11, 1998



KATHY R. TYLER
MY COMMISSION # CC371738 EXPIRES
May 11, 1998
BONDED THRU TROY FAIR INSURANCE, INC.

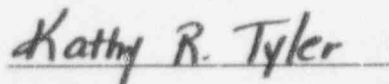
STATE OF FLORIDA
COUNTY OF CITRUS

P. M. Beard, Jr. states that he is the Senior Vice President, Nuclear Operations for Florida Power Corporation; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

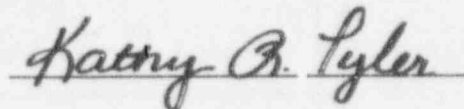


P. M. Beard, Jr.
Senior Vice President
Nuclear Operations

Subscribed and sworn to before me, a Notary Public in and for the State and County above named, this 26th day of January 1995.



Notary Public (print)



Notary Public (signature)

Notary Public, State of Florida at Large,

My Commission Expires: May 11, 1998



KATHY R. TYLER
MY COMMISSION # CC371738 EXPIRES
May 11, 1998
BONDED THRU TROY FAIR INSURANCE, INC.

FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
DOCKET NO. 50-302/LICENSE NO. DPR-72
REQUEST NO. 201
FUEL ENRICHMENT INCREASE

LICENSE DOCUMENT INVOLVED: Technical Specifications

PORTIONS: LCO 3.7.15
SR 3.7.15.1
Design Features 4.2.1 and 4.3

DESCRIPTION:

This submittal requests an increase in the allowable nominal fuel enrichment from 4.2 to 5.0 weight percent for reload fuel assemblies. Additionally, a typographical error in Specification 4.3.1.2.b has been corrected.

REASON:

Florida Power Corporation (FPC) will utilize up to 5.0 weight percent enriched fuel during Cycle 11. Our current fuel storage analysis and Technical Specifications reflect a 4.5 weight percent maximum initial enrichment for storage pool "A", provided that specified minimum assembly burnup limits are met, and a 4.5 weight percent enrichment for the dry fuel storage racks. Region 1 of B pool currently allows a uniform enrichment loading of up to 4.2% U-235 in all storage locations. Region 2 of B pool is currently limited to spent fuel with a maximum initial enrichment of 4.2% U-235. This change supports a fuel enrichment increase of up to 5.0 U-235 nominal enrichment in the dry storage racks and also in A and B pools, provided that specified minimum assembly burnup limits are met.

EVALUATION:

The purpose of limiting allowable fuel enrichment of assemblies stored in the dry racks is to assure sufficient safety margin exists to prevent inadvertent criticality. This is done by assuring a K_{eff} equal to or less than 0.95 is maintained. The analysis in Attachment 1 indicates that storage of 5.0 weight percent (maximum) enriched fuel in the dry (new fuel) storage racks will not cause K_{eff} to exceed 0.95. The racks are assumed to be loaded in three 6 x 3 arrays such that every fourth row in the 6 x 11 rack is vacant. The analysis includes margins for uncertainty in reactivity calculations and in mechanical tolerances.

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Request No. 201
Fuel Enrichment Increase

EVALUATION: (continued)

The purpose of limiting the combination of allowable fuel enrichment and burnup of assemblies stored in storage pools A and B is to assure sufficient safety margin exists to prevent inadvertent criticality. These limits assure a K_{eff} equal to or less than 0.95 is maintained. The analysis provided in Attachments 2 and 3 indicates that the storage of fuel greater than 4.5 weight percent up to 5.0 weight percent initial enriched fuel in storage pools A and B will not cause K_{eff} to exceed 0.95. Administrative controls shall be used to preclude storage of fuel assemblies having less than an acceptable combination of fuel enrichment and burnup. The analysis also includes margins for uncertainty in reactivity calculations and in mechanical tolerances.

Sholly Evaluation:

1. This amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

An increase in fuel enrichment will not by itself affect the mixture of fission product nuclides. A change in fuel cycle design which makes use of an increased enrichment may result in fuel burnup consisting of a somewhat different mixture of nuclides. The effect in this instance is insignificant because:

- a. The isotopic mixture of the irradiated assembly is relatively insensitive to the assembly's initial enrichment.
 - b. Most accident doses are such a small fraction of 10 CFR 100 limits, a large margin exists before any change becomes significant.
 - c. The change in Pu content which would result from an increase in burnup would produce more of some fission product nuclides and less of other nuclides. Small increases in some doses are offset by reductions in other doses. The radiological consequences of accidents are not significantly changed.
2. This amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

As indicated in the attached analyses, an unplanned criticality event will not occur as K_{eff} will not exceed 0.95 with the maximum allowable enriched fuel in Pool A and Pool B, and flooded with unborated water, or the dry storage racks immersed in a water mist of 7.5% moderator density. Criticality is possible for mist environment only if the higher enriched fuel occupies all of the locations in the dry storage racks including those which are required to be vacant.

3. This amendment will not involve a significant reduction in a margin of safety.

While the increased enrichment in Pool A, Pool B, and the dry storage racks may lessen the margin to criticality, this reduction is not significant because the overall safety margin is within NRC criteria of $K_{eff} \leq 0.95$ (NRC Standard Review Plan, Section 9.1.2.)

Therefore, this amendment request satisfies the criteria specified in 10 CFR 50.92 for amendments which do not involve a significant hazards consideration.

Environmental Assessment:

Technical Specification Change Request No. 201 proposes to revise the provisions in the Technical Specifications relating to fuel enrichment. This proposed revision would permit the use of fuel enrichment with Uranium 235 in excess of 4 weight percent and up to 5.0 weight percent. It is expected that the fuel will be irradiated to levels above 33 gigawatt days per metric ton (GWD/MT) but not to exceed 60 GWD/MT. This change is necessary to utilize higher enrichment fuel to provide the flexibility of extending fuel irradiation which permits operation with longer fuel cycles. The principal alternative to this request would be to continue to utilize 4.2 and 4.5 weight percent fuel. However, this would result in reduced operational flexibility and would not reduce the environmental impact of plant operation.

Florida Power Corporation (FPC) has evaluated the potential impact of this change on the radiological assessment of design basis accidents (DBAs) which were previously analyzed for Crystal River Unit 3. As a result, the only DBAs which could be affected by the use of extended burnup fuel would be the fuel handling accident. It is estimated¹ that I-131 fuel gap activity in the peak fuel rod with 60 GWD/MT burnup could be as high as 12%. This value is 20% higher than the value assumed in Regulatory Guide 1.25, (Assumptions used for Evaluating the consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors), Revision 0, March 23, 1972. All other fuel rod gap release activity values are lower than the values assumed in Regulatory Guide 1.25. As a result, a comparison of the thyroid doses resulting from the postulated fuel handling accident are presented below:

Dose Type	Cycle 10	Design Basis	Extended Fuel Burnup
Thyroid Exclusion Boundary	50.06 Rem	40.6 Rem	48.7 Rem

This comparison shows that the thyroid doses which result from the fuel handling accident remain well within the 300 Rem thyroid exposure value set forth in 10 CFR Part 100 and that the small calculated increase is not significant.

Therefore, FPC proposes this change will not adversely affect plant safety. The proposed change has no adverse effect on the probability of an accident. The increased burnup may change the mix of fission products that might be released in the event of an accident but such small changes would result in doses still well within the values set forth in 10 CFR Part 100. No changes are being made in the types or amounts of any radiological effluents that may be released offsite. Additionally, this change does not affect the allowable individual or cumulative occupational exposure.

¹NUREG 5009, "Assessment of the Use of Extended Burnup in Light Water Power Reactors"

Environmental Assessment (continued)

The proposed change to Technical Specifications involves structures, systems, and components located within the restricted area as defined in 10 CFR Part 20. The changes do not affect nonradiological plant effluents and have no other environmental impact.

Therefore, FPC concludes that there is no significant radiological or nonradiological environmental impacts with the proposed change to the Crystal River Unit 3 Technical Specifications.