



**Florida
Power**

CORPORATION
Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72

March 31, 1999
3F0399-12

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 Response to Request for Additional Information -
License Amendment Request #245 Related to Methodology Change for Boraflex
Degradation (TAC No. MA4148)

Reference: FPC to NRC letter, 3F1098-15, dated October 30, 1998, "License Amendment
Request #245, Revision 0, Revision to Licensing Basis - Methodology Change for
Boraflex Degradation"

Dear Sir:

In the referenced letter, Florida Power Corporation (FPC) submitted License Amendment Request (LAR) #245 which proposed a change to the methodology for the Crystal River Unit 3 (CR-3) Spent Fuel Pool B criticality analysis to accommodate degradation of the neutron absorber Boraflex. This letter provides a response to the NRC request for additional information discussed with the NRC Staff during a telephone conference on February 25, 1999. The requested additional information is provided in the attachment.

This letter establishes no new regulatory commitments. If you have any questions regarding this submittal, please contact Mr. Sid Powell, Manager, Nuclear Licensing at (352) 563-4883.

Sincerely,

D. L. Roderick, Director
Nuclear Engineering and Projects

DLR/dah
Attachment

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

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ATTACHMENT

Response to Request for Additional Information - License Amendment Request #245 Related to Methodology Change for Boraflex Degradation

The following is additional information regarding the determination of Boraflex degradation in the Spent Fuel Pool B Racks at Crystal River Unit 3 (CR-3). This information was requested and discussed with the NRC Staff during the telephone conference on February 25, 1999.

Testing of Boraflex Samples

Florida Power Corporation (FPC) uses a surveillance procedure for monitoring weight loss of Boraflex samples in the spent fuel pool. The most recent testing of samples was performed on samples removed in June 1998. The next surveillance samples are planned to be removed and weighed this year prior to new fuel receipt for Refueling Outage 11.

The measured weight loss of the samples removed in June 1998 varied from a low of 1.26 percent to a worst case of 4.68 percent. Neutron attenuation tests of the samples were performed by Holtec, Incorporated. These tests show that the samples have retained boron areal densities that exceed the minimum design values and neutron absorptions comparable to those of standard, unirradiated Boraflex samples. Based on the neutron attenuation tests, FPC concludes that weight loss consists of many constituents, mostly silica, and not entirely boron. However, current projections of Boraflex degradation, as discussed below, conservatively assume that the entire weight loss is attributed to loss of boron.

Projecting Boraflex Degradation

Boraflex degradation in the Spent Fuel Pool B Racks at CR-3 is projected using a calculated degradation rate based on the worst case weight loss of the tested samples. Boraflex degradation at any future point in time can be determined by extrapolation of the most recent sample results. Current worst case calculations project that the Boraflex in the Pool B racks will have degraded to the point of 20 percent loss of neutron absorption in the year 2019. Using the same degradation rate, the estimated current (March 1999) weight loss is 5.3 percent.

The degradation rate is determined by dividing the measured weight loss by the time since installation. The racks were originally installed on February 12, 1992, and samples were removed for testing on June 15, 1998. Therefore, the time since installation was 2315 days. The rate of degradation is calculated as follows:

$$\frac{\text{Percent Degradation}}{\text{Number of Days}} = \frac{4.68\%}{2315 \text{ days}} = 0.002022 \% / \text{day}$$

The new Holtec criticality analysis demonstrates margin to accommodate a 20 percent loss of neutron absorption. Based on the most recent calculated degradation rate, the period of time from June 1998 until 20 percent boron loss is reached is calculated as follows:

$$\frac{(20\% - 4.68\%)}{0.002022 \% / \text{day}} = 7576 \text{ days} = 20.7 \text{ years}$$

Therefore, based on current sample weight loss analysis, degradation to 20 percent will not be reached until 2019.