Florida Power
CORPORATION

October 10, 1979

File: 3-0-3-a-3

Mr. Robert W. Reid
Chief
Operating Reactors Branch #4
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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

Dear Mr. Reid:

Enclosed is Florida Power Corporation's response to informal questions A through E concerning the high density rack modification at CR #3 which were sent to us by Mr. Chris Nelson of your staff.

If you require any further discussion of these responses, please contact this office.

Very truly yours,

FLORIDA POWER CORPORATION

G. C. Moore
Assistant Vice President
Power Production

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STATE OF FLORIDA

COUNTY OF PINELLAS

G. C. Moore states that he is the Assistant Vice President, Power Production, of 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.

G. C. Moore

Subscribed and sworn to before me, a Notary Public in and for the State and County above named, this 10th day of October, 1979.

Catherine S. Cameron
Notary Public

Notary Public, State of Florida at Large,
My Commission Expires: August 8, 1983

CameronNotary 3(D12)

FPC RESPONSE TO INFORMAL NRC QUESTIONS
CONCERNING THE CR #3 HIGH DENSITY RACK MODIFICATION

Question A

The licensee did not provide the estimated manrem for each phase of the pool modification in his response to Question 1. We estimate, from the data given in response to Question 1, that the total manrem for the pool modification is about 250 manrem. This is an order of magnitude greater than we expected. Explain why the dose rates in Question 1 are so high and are different from the values given in Question 4.

Response to Question A

The SFP modification can be divided into four phases of operation which are:

Phase I - Decontamination of Pool A
Phase II - Rack Removal
Phase III - Rack Disposal
Phase IV - Installation of New High Density Racks

For each of the above phases, the number of people required for each phase, the length of each phase, the average dose rate and manrems exposure is provided below.

Phase I - Decontamination:

This phase will require 4 people, working 2 weeks to complete. The average dose rate in Pool A for this phase will be appoximately 25 mr/hr. Two of the 4 people would actually be working in the pool during the 2-week period and would only be in the pool approximately 40% of the time. The manrem exposure for this phase is:

2 people x 80 hrs. = 160 hrs. x 40% = 64 hrs.

64 hrs. x 25 mr/hr = 1.6 manrem

Phase II - Rack Removal:

This phase will require 7 people working 2 weeks to complete. The 7 people will consist of supervisory and Health Physics personnel, 1 crane operator and 2 people working in the pool. We estimate that these 2 workers will be in the pools working 20% of the 2-week period. The average dose rate for this phase is expected to be approximately 15 mr/hr. The manrem exposure for this phase is:

2 people x 80 hrs. = 160 hrs. x 20% = 32 hrs.

32 hrs. x 15 mr/hr = .48 manrem

Phase III - Rack Disposal:

If the racks are cut up at CR #3, it will require the 7 people as per Phase II and will require approximately 1 week. Two of the people would be exposed to the 10 mr/hr dose rate for approximately 60% of time during this phase. The manrem exposure for cutting up the racks would be:

2 x 40 hrs. = 80 hrs. x 60% = 48 hrs.

48 hrs. x 10 mr/hr = .48 manrem

If the racks are shipped offsite intact, it would require 7 people one week to perform this task. The 7 people would be comprised of supervisory personnel, 1 Health Physics Technician, 2 carpenters, 1 crane operator, and 1 rigger. Four of these seven people would be exposed to a 10 mr/hr dose rate for approximately 10% of the 1-week period. The manrem exposure for this task would be:

4 people x 40 hrs. = 160 hrs. x 10% - 16 hrs.

16 hrs. x 10 mr/hr = .16 mr/hr

Phase IV - Installation of New High Density Racks:

This phase will take 10 people working approximately 6 weeks to complete. Four of the 10 people will be exposed to an average dose rate of 15 mr/hr in the pool approximately 40% of this 6-week period. The manrem exposure for this phase is:

4 people x 40 hrs. x 6 wks. = 960 hrs. x 40% - 384 hrs.

384 hrs. x 15 mr/hr = 5.76 manrem

The total manrem exposure for the rack modification at CR #3 is expected to be approximately 8.48 manrem if the racks are cut up at CR #3 and 8.0 manrem if the racks are shipped offsite whole.

Question B

Discuss what you plan to do with the racks. Provide data used to make your decision. This concerns your response to Question 2.

Response to Question B

The old spent fuel racks at CR #3 will be turned over to Allied Nuclear and shipped whole to their facilities for further decontamination and scrapping (Option 3). This option was one of three that was reviewed by Florida Power Corporation. This option was chosen because it will extensively reduce the amount of low level waste requiring burial, it will minimize the manrem exposure to CR #3 personnel, it will reduce the length of Phase III, and it was comparable in cost to Option 2 and significantly less expensive than Option 1.

Response to Question B (Continued)

Option 1, which consisted of shipping the racks whole to Barnwell for burial, would require the burial of approximately 5292 ft^3 of low level waste and would cost $28,000 more than Option 3.

Option 2 consisted of cutting up the racks at CR #3 and shipping to Barnwell for burial. This option reduced the volume of low level material from 5292 ft^3 to 771 ft^3 but it also increased the length of Phase III and increased the manrem exposure to CR #3 personnel. Option 2 and Option 3 are comparable in cost.

Question C

Provide at what refueling the temperature may exceed 125°F and what is the longest time the temperature may exceed 125°F in Question 5.

Response to Question C

The 128°F and 125°F pool temperatures are calculated maximum pool temperatures that were identified in our submittal of the GAI Report No. 1949.

As these values are calculated maximum pool temperatures, the analysis conservatively did not take credit for heat loss through the concrete walls and bottom of the pool and the heat loss to the air above the pool. It should be noted that the design temperature of the spent fuel cooling system is 250°F, well in excess of the calculated operating temperatures.

The actual operating pool temperature of Pool A, with high density racks, is not expected to exceed the 125°F design value.

Question D

Discuss SPF leak collection system, SFP leak detection system and history of leaks from SFP.

Response to Question D

Leakage of the liner of the spent fuel pools at CR #3 is collected by a series of drain pipes located between the concrete and the liner plate. Each of these pipes culminates on Elevation 95' in the Auxiliary Building in the 3B and 3C makeup pump rooms. Each of these lines drain into a trough located in the makeup pump room. These pipes are always open and contain no valves. These lines are checked each shift in the makeup pump room to insure no leakage is occurring in the liner plate. Any leakage that should occur would drain from the trough located in the makeup pump room to the Auxiliary Building sump. The Auxiliary Building sump has a level alarm. The contents of the Auxiliary Building sump is transferred to the Miscellaneous Waste Storage Tank of the Radwaste System.

To date, there has been no leaks from the spent fuel pools at CR #3.

Question E

Discuss why the T.S. limit of 2750 lbs. should not be reduced to a valve closer to the weight of an assembly.

Response to Question E

The T.S. limit of 2750 lbs. is comprised of the following weight:

Fuel Assembly	-	1550 lbs.
Control Rod	-	125 lbs.
Fuel Handling Mast	-	1000 lbs.
Total		2625 lbs.

The 2750 lbs. includes an approximate 5% weight margin for operating flexibility.

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