Florida Power
CORPORATION

Walter S. Wilgus
Vice President
Nuclear Operations

May 9, 1988
3F0588-06

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

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

Dear Sir:

Florida Power Corporation's (FPC) letter dated November 16, 1987 (3F1187-18) committed not to operate Crystal River Unit 3 (CR-3) with a seawater (Ultimate Heat Sink) temperature greater that 85°F until technical justification of a higher temperature could be provided. This letter provides the justification for raising the Ultimate Heat Sink temperature limit for CR-3 to 92°F. FPC commits to operate CR-3 with a maximum seawater temperature of 92°F. If the seawater temperature exceeds 92°F, the action statement of Technical Specification 3.7.5 will be implemented.

FPC has worked with our architect-engineer, Gilbert Commonwealth, Inc. (G/C, Inc.) and other vendors to verify the operability of components cooled by the Nuclear Services Closed Cycle Cooling System (SW) and the Decay Heat Closed Cycle Cooling System (DC) both of which reject heat to the Nuclear Service and Decay Heat Seawater System (RW). Methods employed include system transient thermal analyses, flow balance testing, verification of component operability at SW system and DC system temperatures above 105°F, and an extensive search of the historical seawater temperature data, to demonstrate that when the seawater did exceed 85°F, sufficient margin still existed to assure that the system performed within equipment design limits.

The original design requirements of the SW system and the DC system limited the maximum allowable temperature to 105°F following an accident, based on a RW temperature of 85°F. To envelop the worst case RW temperature ever recorded at CR-3 (90.5°F) and to ensure that all required analyses would not have to be repeated in the future, FPC directed G/C, Inc. to assume a RW temperature of 95°F for all SW and DC systems thermal analyses.

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With the temperature of the RW system fixed, transient temperature profiles were developed for both the SW and the DC system as a function of time. These worst case analyses established peak temperatures of 110°F and 120°F for the SW and DC systems, respectively. FPC has received confirmation from all of its vendors who supplied equipment serviced by either the SW system or the DC system that their equipment meets all design requirements with the increased temperatures. Consequently, CR-3 has never operated in an unsafe condition.

FPC has reviewed ten (10) years of historical plant data on the intake canal water temperature to quantify the worst case RW temperature experienced to date. FPC measures and logs intake and discharge canal water temperature on an hourly basis to satisfy U.S. Environmental Protection Agency (EPA) requirements. The temperature recorded is an average of four (4) thermocouples located at the condenser water box inlet, each thermocouple is calibrated every six (6) months to an accuracy of $\pm$0.5°F. A review of this data showed the intake canal water temperature has averaged 85.9°F and 85.5°F during the months of July and August, respectively. Intake canal water temperature peaked at 90.5°F for only three (3) hours during the same ten year period.

To assure CR-3 would not have operated outside its design limits, a thermal analysis was performed to determine the maximum RW inlet temperature which could occur while maintaining the SW system at or below 105°F. This maximum RW temperature was determined to be 92.4°F. Since CR-3 has not experienced a RW temperature in excess of 90.5°F, the SW system will not operate outside its design limits. FPC is working with G/C, Inc. to determine the comparable RW temperature for the DC system. Since this temperature will be less than the 95°F RW limit used to establish the 120°F operability limit of the DC system certified by our suppliers, FPC considers it acceptable to operate CR-3 at a seawater temperature of less than, or equal to 92°F. The evaluation of the DC system will be completed by July 29, 1988 and FPC will advise the NRC of the results.

During the evaluation of equipment serviced by either the SW system or the DC system, FPC determined the performance of the control complex water chillers (CHHE-1A, 1B) is affected by SW cooling water temperature. Although the chillers will be capable of performing their safety function, the increased SW temperature may result in a phenomenon called "surge." As SW temperature rises, the load requirement on the chiller to maintain stable operation and to prevent "surge" increases. If the non-essential loads now supplied by the control complex water chillers were inadvertently isolated following a LOCA, the load on the chiller would not be sufficient for stable operation. To avoid this remote possibility, FPC will install a "hot-gas bypass" on the chillers. This device puts a false load on the chiller compressor to stabilize operation should building heat load fall below minimum required levels. FPC is working with our chiller supplier to establish equipment qualification and delivery schedules so that a qualified hot-gas bypass can be added to the chillers. We will advise the NRC by June 10, 1988 when the

hot-gas bypass hardware will be installed on the CR-3 control complex water chillers.

FPC is developing test procedures to verify the service water heat exchangers performance is within the assumptions used in the thermal analyses. Testing will be performed by July 18, 1988.

These actions complete those items discussed in the Confirmation of Action letter (NRC letter dated November 17, 1987) on these subjects.

Sincerely,

W. S. Wilgus, Vice President
Nuclear Operations

WSW/JWT/sdr

xc: Dr. J. Nelson Grace
Regional Administrator, Region II

Mr. T. F. Stetka
Senior Resident Inspector