



**Florida  
Power**  
CORPORATION

June 8, 1988  
3F0688-06

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

Subject: Crystal River Unit 3  
Docket No. 50-302  
Operating License No. DPR-72  
Regulatory Guide 1.97  
Neutron Flux Monitors

Dear Sir:

Enclosed is a report concerning the environmental qualification of neutron flux monitors installed to comply with Regulatory Guide 1.97, Revision 3. This report is provided voluntarily.

Should there be any questions, please contact this office.

Sincerely,

Rolf C. Widell, Director  
Nuclear Operations Site Support

DGG/dhd  
Enclosure

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

Mr. T.F. Stetka  
Senior Resident Inspector

A003  
111

VOLUNTARY REPORT  
ENVIRONMENTAL QUALIFICATION OF  
REGULATORY GUIDE 1.97 NEUTRON FLUX MONITORS

BACKGROUND

During the 1985 and 1987 refueling outages at Crystal River Unit 3, installation of additional Neutron Flux Monitors was completed. The monitors were installed to meet Regulatory Guide 1.97 requirements for instruments to monitor reactivity control functions following an accident. These monitors, supplied by Gamma-Metrics, were purchased and installed to meet the Type B, Category 1 requirements of Regulatory Guide 1.97. Completion of this Regulatory Guide 1.97 requirement was documented in Florida Power Corporation's letter to the NRC (letter number 3F0388-18) dated March 21, 1988.

By letter dated May 10, 1988, Gamma-Metrics informed Florida Power Corporation that the cable assemblies associated with the monitors may leak and cause the monitors to fail under design basis accident conditions. The monitors can not be considered to meet Regulatory Guide 1.97 Category 1 requirements if the possibility for their failure under accident conditions exists. This condition was documented by a Nonconforming Operations Report at Crystal River Unit 3 on May 20, 1988.

ANALYSIS

This condition does not significantly compromise plant safety and continued operation without assurance that the Regulatory Guide 1.97 neutron flux monitors will function following an accident is justified as follows.

These neutron flux monitors are installed only to provide means for verifying that reactivity control systems have functioned as expected (ie subcritical conditions have been reached). They perform no accident prevention or mitigation function. Therefore, failure of these monitors would not increase the probability of an accident occurring, or increase the consequences of an accident if it did occur.

There are alternate means available to determine whether subcritical conditions have been reached. Regulatory Guide 1.97 also lists Control Rod position and RCS soluble boron concentration as variables which provide information to indicate whether reactivity control functions are being accomplished. Control Rod position indication is available in the Control Room and RCS soluble boron concentration can be determined by analysis of RCS samples. Assurance that these variables accurately reflect

reactivity conditions is provided by conformance with Crystal River Unit 3 Technical Specification 3.1.1.1.1. This specification requires maintenance of a shutdown margin  $> 1.0\% \Delta k/k$ . Surveillance of the overall core reactivity balance associated with this specification is calculated at least once per 31 Effective Full Power Days of reactor core operation.

The power range monitors (NI-5, 6, 7, 8) originally installed in the plant were qualified for operation in a high pressure and temperature steam-air environment. Although the requirements that these instruments were qualified to may not meet the requirements of Regulatory Guide 1.97, they are high quality items and could be expected to operate following an accident. The outputs of these instruments cover the range 0% to 125% of full power. They could be used to provide backup indication that reactivity control has been achieved.

#### CORRECTIVE ACTIONS

No immediate corrective action is considered necessary. Florida Power Corporation will continue to monitor Gamma-Metrics progress toward resolution of this concern. Modifications to eliminate the possibility of the cable assemblies leaking under accident conditions will be made at an appropriate opportunity. The control room operators will be informed that these monitors may not be reliable under accident conditions and that alternate means for verifying reactivity control should be considered.