

VOLUNTARY REPORT

ENVIRONMENTAL QUALIFICATION OF REGULATORY GUIDE 1.97 NEUTRON FLUX MONITORS REVISION 1

BACKGROUND

During the 1985 and 1987 refueling outages at Crystal River Unit 3, additional Neutron Flux Monitors were installed. 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 as environmentally qualified 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 cannot 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 to provide means for verifying that reactivity control systems have functioned as expected (i.e. 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 recognizes Control Rod position and RCS soluble boron concentration as variables which provide information to indicate whether reactivity control functions are being accomplished.

FSAR section 7.1.2.2 describes how the reactor protection system (RPS) automatically accomplishes the insertion of the control rods. Once the reactor protection system actuates the circuit breakers which energize the control rod drive system open. The trip signal from the RPS to these breakers remains until manually reset by an operator. The circuit breakers cannot be reclosed until the trip signal is reset. Once the circuit

breakers are closed and the control rods are re-energized, a complex set of manual control inputs is still necessary before any control rods can be withdrawn. Based upon the described events/actions, it can be seen that once the RPS is actuated, it is not credible to assume that control rods would be withdrawn except as part of a planned start-up.

The Post Accident Sampling System is used to take samples to assure boric acid concentration is maintained. This sampling can be performed under all FSAR postulated accident conditions.

Both the RPS, by automatically inserting the control rods and the Post Accident Sampling System, by providing boron concentration of the RCS, assure that reactivity conditions monitoring are provided.

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 are anticipated to be made during refuel VII. The control room operators will be informed that these monitors may not be reliable under accident conditions and that alternate means of verifying reactivity control should be considered.