Florida Power
CORPORATION

April 30, 1986
3F0486-15

Mr. John F. Stolz, Director
PWR Project Directorate #6
Division of PWR Licensing B
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
NUREG-0737, Item II.E.1.2
Inadvertent Emergency Feedwater Actuations

Dear Sir:

Florida Power Corporation (FPC) installed the Emergency Feedwater Initiation and Control (EFIC) System in accordance with NUREG-0737, Item II.E.1.2. Since the installation of this system, several inadvertent EFIC actuations have occurred due to OTSG low level spiking events.

FPC is proceeding in the development of a design modification to limit the number of emergency feedwater (EFW) actuations due to OTSG low level spiking events. The spiking event is created by a pressure pulse wave which travels through the main steam lines to the OTSG's whenever the turbine trips or main steam isolation valves (MSIV) are closed. This pressure pulse causes the emergency feedwater initiation and control (EFIC) transmitters SP-025-LT through SP-032-LT to instantaneously sense a pressure differential change which momentarily simulates a change in OTSG level. This type of occurrence has been experienced and observed at both Toledo Edison's Davis-Besse and Arkansas Power and Light's ANO Unit 1. The design modification in progress proposes to alter the EFIC logic circuit to permit installation of a time delay relay. The time delay relay allows the input signal from the low level bistable to the EFW initiate module to be momentarily delayed to avoid actuation of emergency feedwater on this sensed pressure pulse. The time delay relay selected for this modification is a contact coil type manufactured by Logitek, Inc. and is identified as a

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D.C. voltage monitor Type VDD-22-J.XX/19-2.00/0.250-28. The voltage monitoring component has been designed and tested to military specification requirements and proven for military application. The monitoring component has not been subjected to IEEE type testing and qualified for nuclear application. The manufacturer has subjected the component to shock and vibration tests, but these tests did not demonstrate that the relay contacts were monitored for contact "chatter" during the test. Since the operational capability of the monitor during vibrational testing is not known, consideration must be given to incorrect operation of the component during a seismic event. It can be postulated that two incorrect operations could result during the event as follows:

1. The VDD monitoring device could not energize and change relay state.

2. The output contacts could intermittently open or bounce.

The first incorrect operation would not initiate EFW if called upon due to low OTSG level. The second incorrect operation could result in initiation of EFW when not required. These would only occur during the seismic event. After the event, qualification testing has shown the relays would function properly.

The time delay relay modification effects only the steam generator low level initiation function. One can postulate that functional failure of the timing relay due to a seismic event would cause EFIC not to initiate should a true steam generator low level occur during a seismic event. Steam generator low level is just one input parameter to the system. EFIC can still initiate EFW on loss of all four reactor coolant pumps or loss of both main feedwater pumps. The system can also be initiated manually by the operator. The design criteria for the plant does not take credit for survival of the turbine building during a seismic event, including those portions of the main feedwater system located in the turbine building. This means the emergency feedwater system would be initiated due to the loss of main feedwater independent of the steam generator level. The effect of incorrect operation of the timing relay would be negligible. The overall risk to plant safety associated with the possible failure of the timing relay during a seismic event is insignificant compared to the undesirable results of emergency feedwater actuations presently experienced because of low level spiking.

It should be noted that the component has been subjected to vibrational test programs in excesses of our requirement and demonstrated to function after these tests, but just not proven for our nuclear requirements per IEEE 323 and IEEE 344.

The installation of this time delay relay is not being considered a permanent solution to the spiking problem, but as an interim fix. The design modification is being proposed as a temporary modification to limit

the number of challenges to a sensitive safety system. This temporary modification permits FPC to evaluate proposed long term solutions and allow CR-3 to operate safely without subjecting it to unnecessary transient events.

This temporary modification is scheduled for installation during the present reactor coolant pump outage. FPC plans to have a permanent design scheme available for our next scheduled refueling outage (Refuel VI). Since January of this year, FPC has been participating with the other EFIC owners in developing a common design to be shared by each owner.

Although the proposed device is not completely qualified for the EFIC system, FPC considers the small risk acceptable compared to the undesirable operational results of additional inadvertent EFIC actuations.

Please review this modification expeditiously in order to permit installation of the time delay relays during the present outage.

Per 10 CFR 170, attached is FPC application fee for one hundred fifty dollars (check #0429-039).

Sincerely,

Rolf C. Widell

Rolf C. Widell
Manager, Nuclear Operations
Licensing and Fuel Management

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