Docket No. 50-302 June 5, 1989

Mr. W. S. Wilgus
Vice President, Nuclear Operations
Florida Power Corporation
ATTN: Manager, Nuclear Operations
Licensing
P. O. Box 219-NA-2I
Crystal River, Florida 32629

Dear Mr. Wilgus:

SUBJECT: CRYSTAL RIVER UNIT 3 (CR-3) - EXEMPTION FROM REQUIREMENTS OF 10 CFR PART 50, APPENDIX A, GENERAL DESIGN CRITERION-4

The Commission has issued the enclosed exemption from the requirements of 10 CFR Part 50, Appendix A, General Design Criterion-4 (GDC-4). This exemption permits CR-3 to operate without conforming to the requirements of GDC-4 with respect to the environmental and dynamic effects of high energy line breaks (HELB) until the end of Refuel 7, currently scheduled for the spring of 1990.

This exemption is intended to apply to those modifications made from original plant construction to the present. Members of your staff have informed us that HELB considerations will be included in the design of any modifications to safety systems which are or will be in the design process prior to expiration of the exemption.

A copy of the exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,
/s/
Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects-I/II
Office of Nuclear Reactor Regulation

Enclosure: As stated

cc w/enclosure:
See next page

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[CR-3 EXEMPTION LTR] SEE PREVIOUS CONCURRENCE*

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Generating Plant

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of FLORIDA POWER CORPORATION, et al. (Crystal River Unit 3)	)	Docket No. 50-302

EXEMPTION

I.

Florida Power Corporation, et al. (FPC, the licensee) are the holders of Facility Operating License No. DPR-72, which authorizes operation of Crystal River Unit 3 (CR-3, the facility) at steady-state power levels not in excess of 2544 megawatts thermal. The license provides, among other things, that the facility is subject to all the rules, regulations, and orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facility is a pressurized water reactor (PWR) located at the licensee's site in Citrus County, Florida.

II.

10 CFR Part 50, Appendix A, General Design Criterion-4 (GDC-4) requires that structures, systems, and components important to safety be designed to accommodate the effects of postulated accidents. The structures, systems and components are required to be appropriately protected against dynamic effects, including missiles, pipe whipping, and discharging fluids that may result from equipment failures. At the time of licensing CR-3, the criteria employed by the licensee to analyze the effects of high energy line breaks (HELB) outside containment were consistent with the staff's position as contained in the AEC

letter dated December 22, 1972 from A. Giambusso. However, the licensee reported recently that modifications involving safety-related equipment outside containment installed since that time were made without adequate consideration of HELB criteria.

III.

The licensee promptly embarked on a comprehensive program to identify all break locations and safety-related systems and equipment which must function to mitigate the effects of HELB events to ensure safe shutdown of the plant, and to protect such equipment as necessary. FPC also performed an evaluation to show that continued operation of the facility while the identified deficiencies are being corrected does not constitute a threat to the health and safety of the public. The facility has been shut down for unrelated reasons during much of the time since identification of the HELB problem.

By letter dated December 16, 1988, as supplemented by letter dated May 24, 1989, the licensee requested a temporary exemption from the requirements of GDC-4 with respect to consideration of the environmental and dynamic effects of HELB. The licensee requested that the exemption remain in effect until all actions, including hardware modifications, have been completed. Because FPC's program may include areas accessible only during shutdown, this was originally expected to occur no later than restart from Refuel 8, then scheduled during the fall of 1991. The staff considered this proposed exemption period to be excessive, and continued discussions with the licensee indicated that elements of its proposed schedule could be completed earlier. In its letter of May 24, 1989, the licensee stated that completion in 1990 is anticipated. The first major schedule milestone, submittal of revised licensing and design basis criteria, was completed on March 31, 1989, on schedule. In addition, refueling outages have been delayed 6 months, so that the next refueling outages will start

approximately March 1990 (Refuel 7) and March 1992 (Refuel 8), rather than September 1989 and September 1991, as previously anticipated. The licensee has committed to review the program and schedules to determine what portion of the high energy piping can be protected during near-term plant operation in order to maximize full protection of safety systems at the earliest possible time. It is believed that actions to protect most, if not all, systems important to safety against the effects of HELB can be completed by the end of Refuel 7.

There is reasonable assurance that the proposed exemption will present no undue risk to public health and safety because:

-- The likelihood of an HELB not previously analyzed and protected against in an area which could affect redundant safety systems required to mitigate that break is low. The licensee has reviewed the piping system stress analyses and has determined that the postulated terminal end break locations are not highly stressed and that breaks at these locations are low probability events. In addition, the contribution of seismic loads to the potential for HELBs appears to be overstated because of the location of the facility in a seismically inactive area. Further, although new components (primarily potential targets) have been added, they are generally in areas where other principal safety system components are located which were analyzed as targets during original plant licensing, and therefore many potential HELB interactions with the new components are likely to have been adequately treated by features of the original design. With regard to the main feedwater system, the licensee's program in response to Bulletin 87-01, Thinning of Pipe Walls in Nuclear Power Plants, reduces the probability of an HELB in this

system. Also, the auxiliary steam line in the Auxiliary Building has been closed until permanent resolution of the HELB problem, leaving relatively few potential break locations in the Auxiliary Building.

-- Due to imposition of other criteria, such as electrical separation and 10 CFR Part 50, Appendix R, Fire Protection, there is a reduced likelihood that one HELB can cause loss of safety function by impacting multiple trains of safety equipment. Additional confidence in the survivability of equipment required for reactor coolant system inventory control and the ability to shut down safely exists due to the previously postulated loss of the makeup function in each of 11 fire zones used during the 10 CFR Part 50, Appendix R review. Safe shutdown was demonstrated in each case, and since the effects of pipe breaks are more localized than those caused by a fire, the Appendix R analyses probably bound the HELB accident. The licensee also concluded that none of the identified breaks would prevent the makeup system from performing its inventory control function. Decay heat can be removed using either the emergency feedwater (EFW) system or high pressure injection (HPI) system. FPC has determined that no HELB event in the Intermediate Building can affect HPI, and that no HELB in the Auxiliary Building will affect EFW. Therefore, in the unlikely event of an HELB, removal of decay heat could be accomplished. Additionally, since most plant modifications adding HELB targets were associated with the addition of automatic capability, the original manual capability to initiate safety functions should, in general, remain protected against an HELB. Finally, plant procedures and

operator training regarding identification of leaks and compensatory measures in the event of an HELB will help in avoiding HELBs and if one should occur, in mitigating its effects.

This case involves special circumstances as set forth in 10 CFR 50.12(a)(v). This exemption "would provide only temporary relief from the applicable regulations" (GDC-4). The exemption is requested for a specific time period, after which the facility would be in conformance with the requirements of GDC-4. Therefore, the proposed exemption would provide only temporary relief until the licensee can permanently resolve identified deficiencies.

Since identification of the problem to the NRC, FPC has made good faith efforts to assure complete and expedited conformance to GDC-4. The licensee mounted a significant effort to identify all possible HELB targets. A complete program was defined to resolve the problem and the first important milestone has been completed. This action, preparation of pipe rupture analysis criteria, represents a significant effort to define HELB criteria to improve plant safety and reduce personnel exposure. The commitment to early protection of the maximum amount of safety equipment, as discussed above, is further evidence of FPC's good faith efforts.

IV.

Based on the above, and on review of the licensee's submittals to date, the NRC staff concludes that: (1) the probability of an HELB which could affect public health and safety is low, and (2) in the event of an HELB, it is likely that no loss of safety function would occur and that the facility could be safely shut down. Therefore, the NRC staff finds the proposed exemption (with revised expiration date) from certain requirements of GDC-4 to Appendix A of 10 CFR Part 50 to be acceptable.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, this exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission further determines that special circumstances, as provided in 10 CFR 50.12(a)(2)(v), are present justifying the exemption, namely that the exemption would provide only temporary relief from the applicable regulation and that FPC has made good faith effort to comply with the regulation.

Therefore, the Commission hereby approves the following exemption: The facility may operate without conforming to the requirements of GDC-4 with respect to the environmental and dynamic effects of HELB. This exemption shall expire by the end of Refuel 7, currently scheduled to begin in March 1990.

Pursuant to 10 CFR 51.32, the Commission has determined that granting this exemption will have no significant effect on the quality of the human environment (June 5, 1989, 54 FR 24057).

For further details with respect to this action, see the licensee's request dated December 16, 1988 and its submittal dated March 31, 1989, which are available for public inspection at the Commission's Public Document Room, 2120 L Street, N.W., Washington, D. C. and at the Crystal River Public Library, 668 N.W. First Avenue, Crystal River, Florida 32629.

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Director
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 5th day of June 1989.