

Mr. Roy A. Anderson  
Senior Vice President,  
Nuclear Operations  
Florida Power Corporation  
ATTN: Manager, Nuclear Licensing  
Crystal River Energy Complex (SA2A)  
15760 W Power Line Street  
Crystal River, Florida 34428-6708

May 21, 1997

SUBJECT: CRYSTAL RIVER 3 - ENVIRONMENTAL ASSESSMENT OF REQUEST FOR EXEMPTION  
FROM CERTAIN REQUIREMENTS OF 10 CFR 50.60, ACCEPTANCE CRITERIA FOR  
FRACTURE PREVENTION FOR LIGHTWATER NUCLEAR POWER REACTORS FOR NORMAL  
OPERATION (TAC NO. M98380)

Dear Mr. Anderson:

Enclosed is a copy of an "Environmental Assessment and Finding of No  
Significant Impact" for your information. This assessment relates to your  
letter dated April 7, 1997, which requested an exemption from certain  
requirements of 10 CFR 50.60 relating to low temperature overpressure  
protection. The proposed exemption would permit using the safety margins  
recommended in the American Society of Mechanical Engineers Boiler and  
Pressure Vessel Code Case N-514, "Low Temperature Overpressure Protection," in  
lieu of the safety margins required by 10 CFR Part 50, Appendix G.

This notice is being forwarded to the Office of the Federal Register for  
publication.

Sincerely,

Original signed by

L. Raghavan, Project Manager  
Project Directorate II-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosure: Environmental Assessment

cc w/enclosure: See next page

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Mr. Roy A. Anderson  
Florida Power Corporation

**CRYSTAL RIVER UNIT NO. 3  
GENERATING PLANT**

cc:

Mr. R. Alexander Glenn  
Corporate Counsel  
Florida Power Corporation  
MAC-A5A  
P.O. Box 14042  
St. Petersburg, Florida 33733-4042

Mr. Bruce J. Hickie, Director  
Nuclear Plant Operations (NA2C)  
Florida Power Corporation  
Crystal River Energy Complex  
15760 W. Power Line Street  
Crystal River, Florida 34428-6708

Mr. Robert B. Borsum  
B&W Nuclear Technologies  
1700 Rockville Pike, Suite 525  
Rockville, Maryland 20852

Mr. Bill Passetti  
Office of Radiation Control  
Department of Health and  
Rehabilitative Services  
1317 Winewood Blvd.  
Tallahassee, Florida 32399-0700

Attorney General  
Department of Legal Affairs  
The Capitol  
Tallahassee, Florida 32304

Mr. Joe Myers, Director  
Division of Emergency Preparedness  
Department of Community Affairs  
2740 Centerview Drive  
Tallahassee, Florida 32399-2100

Chairman  
Board of County Commissioners  
Citrus County  
110 North Apopka Avenue  
Iverson, Florida 34450-4245

Mr. David Kunsemiller, Director  
Nuclear Operations Site Support  
(SA2A)  
Florida Power Corporation  
Crystal River Energy Complex  
15760 W. Power Line Street  
Crystal River, Florida 34428-6708

Senior Resident Inspector  
Crystal River Unit 3  
U.S. Nuclear Regulatory Commission  
6745 N. Tallahassee Road  
Crystal River, Florida 34428

Mr. John P. Cowan  
Vice President, Nuclear Production  
(SA2C)  
Florida Power Corporation  
Crystal River Energy Complex  
15760 W. Power Line Street  
Crystal River, Florida 34428-6708

Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
61 Forsyth Street, SW., Suite 23T85  
Atlanta, Georgia 30303-3415

Mr. Kerry Landis  
U.S. Nuclear Regulatory Commission  
61 Forsyth Street, SW., Suite 23T85  
Atlanta, Georgia 30303-3415

Mr. Heinz Muller (5 copies)  
Environmental Protection Agency  
Environmental Review Coordinator  
345 Courtland Street, NE  
Atlanta, Georgia 30365

UNITED STATES NUCLEAR REGULATORY COMMISSION

FLORIDA POWER CORPORATION

DOCKET NO. 50-302

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U. S. Nuclear Regulatory Commission (the Commission) is considering issuance of an exemption from certain requirements of its regulations to Facility Operating License No. DPR-72 issued to Florida Power Corporation, (the licensee), for operation of the Crystal River Unit 3 Nuclear Generating Plant (CR3) located in Citrus County, Florida.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action:

The proposed action is in accordance with the licensee's application dated April 7, 1997 for exemption from certain requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Lightwater Nuclear Power Reactors for Normal Operation" which would allow the licensee to utilize the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Case N-514, "Low Temperature Overpressure Protection," to determine its low temperature overpressure protection (LTOP) setpoints. The licensee requests an exemption from certain requirements of 10 CFR 50.60, to allow application of an alternate methodology to determine the LTOP setpoints for CR3. The proposed alternate methodology is consistent with guidelines developed by the ASME Working Group to define pressure limits during LTOP events that avoid certain unnecessary operational restrictions, provide adequate margins against failure of the reactor pressure vessel, and reduce the potential for unnecessary activation of pressure-relieving devices used for LTOP. These guidelines have been incorporated into Code Case N-514,

"Low Temperature Overpressure Protection," which has been approved by the ASME Code Committee. The content of Code Case N-514 has been incorporated into Appendix G of Section XI of the ASME Code and published in the 1993 Addenda to Section XI. However, 10 CFR 50.55a, "Codes and Standards," and Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability" have not been updated to reflect the acceptability of Code Case N-514.

The philosophy used to develop Code Case N-514 guidelines is to ensure that the LTOP limits are still below the pressure/temperature (P/T) limits for normal operation but allow the pressure that may occur with activation of pressure-relieving devices to exceed the P/T limits, provided acceptable margins are maintained during these events. This philosophy protects the pressure vessel from LTOP events and still maintains the Technical Specifications P/T limits applicable for normal heatup and cooldown in accordance with 10 CFR Part 50, Appendix G, and Sections III and XI of the ASME Code.

The Need for the Proposed Action:

Pursuant to 10 CFR 50.60, all lightwater nuclear power reactors must meet the fracture toughness requirements for the reactor coolant pressure boundary as set forth in 10 CFR Part 50, Appendix G, which defines P/T limits during any condition of normal operation including anticipated operational occurrences and system hydrostatic tests, to which the pressure boundary may be subjected over its service lifetime. It is specified in 10 CFR 50.60(b) that alternatives to the described requirements in 10 CFR Part 50, Appendix G, may be used when an exemption is granted by the Commission pursuant to 10 CFR 50.12.

To prevent transients that would produce excursions exceeding the 10 CFR Part 50, Appendix G, P/T limits while the reactor is operating at low temperatures, the licensee installed an LTOP system. The LTOP system includes a pressure-relieving device in the form of a power-operated relief valve (PORV). The PORV is set at a pressure below the LTOP enabling temperature that would prevent the pressure in the reactor vessel from exceeding the P/T limits of 10 CFR Part 50, Appendix G. To prevent the PORV from lifting as a result of normal operating pressure surges (e.g., reactor coolant pump starting or stopping) with the reactor coolant system in a water solid condition, the operating pressure must be maintained below the PORV setpoint. The licensee indicates that its LTOP PORV setpoint based on the 10 CFR Part 50, Appendix G, would restrict the P/T operating window and could potentially result in undesired actuation of the PORV during normal heatup and cooldown operation. The operating window is restricted by the difference between the P/T limit curves and the reactor coolant pump net positive suction head curve. Therefore, the licensee proposed to use the safety margins developed in an alternate methodology in lieu of the safety margins required by 10 CFR Part 50, Appendix G for determining the allowable pressure, and the PORV setpoint for LTOP events. The alternate methodology is consistent with ASME Code Case N-514. The content of Code Case N-514 was incorporated into Appendix G of Section XI of the ASME Code and published in the 1993 Addenda to Section XI.

An exemption from 10 CFR 50.60 is required to use the alternate methodology for calculating the maximum allowable pressure for LTOP considerations. By application dated April 7, 1997, the licensee requested an

exemption from 10 CFR 50.60 to allow it to utilize the alternate methodology of Code Case N-514 for computing its LTOP setpoints.

Environmental Impacts of the Proposed Action:

Appendix G of the ASME Code requires that the P/T limits be calculated (a) using a safety factor of 2 on the principal membrane (pressure) stresses, (b) assuming a flaw at the surface with a depth of one-quarter (1/4) of the vessel wall thickness and a length of 6 times its depth, and (c) using a conservative fracture toughness curve that is based on the lower bound of static, dynamic, and crack arrest fracture toughness tests on material similar to the CR3 reactor vessel material.

In determining the PORV setpoint for LTOP events, the licensee proposed the use of safety margins based on an alternate methodology consistent with the proposed ASME Code Case N-514, which allows determination of the setpoint for LTOP events such that the maximum pressure in the vessel will not exceed 110 percent of the P/T limits of the existing ASME Appendix G. All other factors, including assumed flaw size and fracture toughness, will be consistent with the 10 CFR 50.60, Appendix G. Although this methodology would reduce the safety factor on pressure, the margins with respect to toughness are acceptable for LTOP transients. Thus, applying Code Case N-514 will satisfy the underlying purpose of 10 CFR 50.60 for fracture toughness requirements. Further, by relieving the operational restrictions, the potential for undesirable lifting of the PORV would be reduced, thereby improving plant safety.

The change will not increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released offsite, and there is no significant increase in the allowable

individual or cumulative occupational radiation exposure. Accordingly, the Commission concludes that there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological impacts, the proposed action does involve features located entirely within the restricted area as defined in 10 CFR Part 20. It does not affect nonradiological plant effluents and has no other environmental impact. Accordingly, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed action.

Alternative to the Proposed Action:

As an alternative to the proposed action, the staff considered denial of the proposed action. Denial of the application would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action did not involve the use of any resources not previously considered in the Final Environmental Statements related to operation of CR3, dated May 1973.

Agencies and Persons Consulted:

In accordance with its stated policy, on May 12, 1997 the staff consulted with the Florida State Official, Mr. Bill Passetti of the Florida Department of Health and Rehabilitative Services, regarding the environmental impact of the proposed action. The State official had no comments.

FINDING OF NO SIGNIFICANT IMPACT

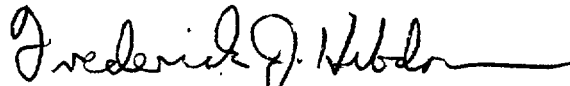
The Commission has determined not to prepare an environmental impact statement for the proposed exemption. Based upon the foregoing environmental

assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the request for exemption dated April 7, 1997 which is available for public inspection at the Commission's Public Document Room, 2120 L Street, NW., Washington, DC and at the local public document room located at Coastal Region Library, 8619 W. Crystal Street, Crystal River, Florida 32629.

Dated at Rockville, Maryland, this 21 day of May 1997.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in dark ink, appearing to read "Frederick J. Hebdon", with a long horizontal flourish extending to the right.

Frederick J. Hebdon, Director  
Project Directorate II-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation