August 31, 1998

Mr. John Paul Cowan, Vice President
Nuclear Operations (NA2E)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 - STAFF EVALUATION AND ISSUANCE OF AMENDMENT RE: REACTOR COOLANT PUMP FLYWHEEL INSPECTION REQUIREMENTS (TAC NO. MA2145)

Dear Mr. Cowan:

The Commission has issued the enclosed Amendment No. 170 to Facility Operating License No. DPR-72 for the Crystal River Unit 3. This amendment is in response to your request dated April 28, 1998, in which you proposed to revise Improved Technical Specification 5.6.2.8 to change the scope and frequency of volumetric and surface inspections for the reactor coolant pump flywheels. The amendment approves the requested change to reflect the frequency and scope of these inspections as specified in Topical Report WCAP-14535A. The staff noted that the quality of this submittal was good and required no additional information or clarification.

A copy of the related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:

Leonard A. Wiens, Senior Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosures: 1. Amendment No. 170 to DPR-72
2. Safety Evaluation

cc w/enclosures: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 31, 1998

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Florida Power Corporation
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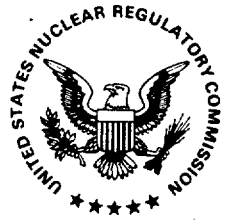

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FLORIDA POWER CORPORATION
CITY OF ALACHUA
CITY OF BUSHNELL
CITY OF GAINESVILLE
CITY OF KISSIMMEE
CITY OF LEESBURG
CITY OF NEW SMYRNA BEACH AND UTILITIES COMMISSION,
CITY OF NEW SMYRNA BEACH
CITY OF OCALA
ORLANDO UTILITIES COMMISSION AND CITY OF ORLANDO
SEMINOLE ELECTRIC COOPERATIVE, INC.
CITY OF TALLAHASSEE

DOCKET NO. 50-302

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 170
License No. DPR-72

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Florida Power Corporation, et al. (the licensees) dated April 28, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-72 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 170, are hereby incorporated in the license. Florida Power Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

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

Attachment: Changes to the Technical Specifications

Date of Issuance: August 31, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 170

FACILITY OPERATING LICENSE NO. DPR-72

DOCKET NO. 50-302

Revise the Appendix A Technical Specifications by removing the page identified below and inserting the enclosed page. The revised page is identified by the captioned amendment number and contains marginal lines indicating the area of change.

REMOVE	INSERT
5.0-11	5.0-11

5.6 Procedures, Programs and Manuals

5.6.2.6 Post Accident Sampling (continued)

c. Provisions for maintenance of sampling and analysis equipment.

5.6.2.7 Containment Tendon Surveillance Program

This program provides controls for monitoring any tendon degradation in concrete containments, including effectiveness of its corrosion protection medium, to ensure containment structural integrity. The program shall include baseline measurements prior to initial operations. The Containment Tendon Surveillance Program, inspection frequencies, and acceptance criteria shall be in accordance with Regulatory Guide 1.35, Revision 3, 1990.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Containment Tendon Surveillance Program inspection frequencies.

5.6.2.8 Inservice Inspection Program

This program provides controls for inservice inspection of ASME Code Class 1, 2, and 3 components, including applicable supports. The program shall include the following:

a. Provisions that inservice inspection of ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a;

b. The provisions of SR 3.0.2 are applicable to the frequencies for performing inservice inspection activities;

c. Inservice inspection of each reactor coolant pump flywheel shall be performed at least once every ten years. The inservice inspection shall be either an ultrasonic examination of the volume from the inner bore of the flywheel to the circle of one-half the outer radius or a surface examination for exposed surfaces of the disassembled flywheels. The recommendations delineated in Regulatory Guide 1.14, Positions 3, 4 and 5 of Section C.4.b shall apply.

d. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any TS.

(continued)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 170 TO FACILITY OPERATING LICENSE NO. DPR-72

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

1.0 INTRODUCTION

By letter dated April 28, 1998, Florida Power Corporation (the licensee) submitted for staff review its proposed Technical Specifications (TS) change for Crystal River Unit 3 regarding inspection requirements for the reactor coolant pump (RCP) flywheels. This submittal is related to the Westinghouse topical report, WCAP-14535A, "Topical Report on Reactor Coolant Pump Flywheel Inspection Elimination," which was approved on September 12, 1996 by the United States Nuclear Regulatory Commission (USNRC) with certain conditions. The licensee intended to change the RCP flywheels inspection intervals in accordance with the conclusion of the safety evaluation report (SER) on WCAP-14535A.

The function of RCP in the reactor coolant system (RCS) of a pressurized water reactor (PWR) plant is to maintain an adequate cooling flow rate by circulating a large volume of primary coolant water at high temperature and pressure through the RCS. A concern regarding overspeed of the RCP and its potential for failure led to the issuance of Regulatory Guide (RG) 1.14 in 1971. Since then, all licensees for PWR plants, with very few exceptions, have adopted the guidelines of RG 1.14 to conduct their RCP flywheel examinations. These requirements are normally specified in the individual plant's TS, as is the case for Crystal River 3.

2.0 EVALUATION

In the SER to the Westinghouse Topical Report, WCAP-14535A, the staff stated that the evaluation methodology for RCP flywheels in WCAP-14535A is appropriate and the criteria are in accordance with the design criteria of RG 1.14 for a fatigue life of at least 10 years. In addition, the staff specified:

" (1) Licensees who plan to submit a plant-specific application of this topical report for flywheels made of SA 533 B material need to confirm that their flywheels are made of SA 533 B material. Further, licensees having Group-15 flywheels need to demonstrate that material properties of their A516 material is equivalent to SA 533 B material, and its reference temperature, RT_{NDT}, is less than 30°F.

"(2) Licensees who plan to submit a plant-specific application of this topical report for their flywheels not made of SA 533 B or A516 material need to either demonstrate that their flywheel material properties are bounded by those of SA 533 B material, or provide the minimum specified ultimate tensile stress, S_u; the fracture toughness, K_{Ic}; and the reference temperature, RT_{NDT}, for that material. For the latter, the licensees should employ these material properties, and use the methodology in the topical report, as extended in the two responses to the staff's request for additional information (RAI), to provide an assessment to justify a change in inspection schedule for their plants.

"(3) Licensees meeting either (1) or (2) above should either conduct a qualified in-place ultrasonic testing (UT) examination of the volume from the inner bore of the flywheel to the circle of one-half the outer radius or conduct a surface examination (MT and/or PT) of exposed surfaces defined by the volume of the disassembled flywheels once every 10 years. The staff considers this 10-year inspection requirement not burdensome when the flywheel inspection is conducted during scheduled ISI inspection or RCP motor maintenance. This would provide an appropriate level of defense in depth."

The licensee confirmed in its submittal that four flywheels for Crystal River 3 were Group 16 flywheels made of A516 material. The fifth is made of A508 material. Although Condition 1, above, specifies a requirement for Group 15 flywheels (made of A516 material also), the intention of Condition 1 was to also include Group 16 flywheels. The licensee provided the minimum yield strength, ultimate tensile strength, percent elongation, and chemistry composition for the four flywheels. The staff compared directly the fracture toughness of A516 material with that of an SA 533 B material. The data for A516 material from "Structural Alloys Handbook" by R. L. Brockenbrough indicate that K_{Ic} for A516 material is around 60 ksi(inch)^{½}, comparable to that from the American Society of Mechanical Engineers (ASME) K_{Ic} curve for RT_{NDT} = 60°F used in WCAP-14535A. Further, the allowable crack length for the Crystal River flywheels of A516 material is 0.7 inch. This exceeds the allowable crack length of 0.4 inch accepted by the staff in the SER for WCAP-14535A. As a result, the K_{Ic} for the flywheels of Crystal River 3 can be as low as 45 ksi(inch)^{½} (60 ksi(inch)^{½} times the square root of the ratio of 0.4 inch to 0.7 inch). The staff determined that this additional margin of 15 ksi(inch)^{½} in K_{Ic} is sufficient to account for the uncertainty caused by the relatively few K_{Ic} test data for A516 material. Hence, A516 material has adequate fracture toughness for this application.

For the fifth flywheel made of A508 material, since WCAP-14535A did not mention this material, the staff did not specify in the SER for WCAP-14535A any requirement for flywheels made of this material. Condition 2 cited above for flywheels not made of SA 533 B or A516 material was not intended to include flywheels made of A508 material. The licensee provided the minimum yield strength, ultimate tensile strength, percent elongation, and fracture toughness values at 70°F and -40°F for the fifth flywheel, and concluded that A508 material is as tough as SA 533 B material. The staff agrees with the licensee's conclusion because the ASME K_{Ic} curve is applicable to both SA 533 B and A508 materials as specified in Appendix A of the ASME Code.

3.0 SUMMARY

The NRC staff has reviewed the licensee's submittal. The staff has determined that the analysis and conclusions in the Westinghouse topical report WCAP-14535A is applicable to Crystal River 3. Hence, the staff accepts the licensee's proposed TS change, i.e., 10-year inspection intervals for RCP flywheels, to Paragraph 5.6.2.8, "Inservice Inspection Program" for Crystal River 3.

4.0 STATE CONSULTATION

Based upon written notice of the proposed amendment, the Florida State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATIONS

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding (63 FR 40555). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

Based on its evaluation, the staff concludes that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Simon Sheng

Dated: August 31, 1998

Mr. John Paul Cowan
Florida Power Corporation

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

Mr. Charles G. Pardee, 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
Framatome Technologies Inc.
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Mr. William A. Passetti, Chief
Department of Health
Bureau of Radiation Control
2020 Capital Circlel, SE, Bin #C21
Tallahassee, Florida 32399-1741

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
Inverness, Florida 34450-4245

Mr. Robert E. Grazio, Director
Nuclear Regulatory Affairs (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. Gregory H. Halnon
Director, Quality Programs (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, GA 30303-3415

Mr. Leonard D. Wert
U.S. Nuclear Regulatory Commission
61 Forsyth Street, SW., Suite 23T85
Atlanta, GA 30303-3415