

June 14, 1999

Mr. John Paul Cowan
Vice President, Nuclear Operations
Florida Power Corporation
ATTN: Manager, Nuclear Licensing (NA1B)
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 - ISSUANCE OF AMENDMENT REGARDING BASIS
FOR REACTOR COOLANT SYSTEM LEAKAGE DETECTION
INSTRUMENTATION (TAC NO. MA3755)

Dear Mr. Cowan:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 179 to Facility Operating License No. DPR-72 for Crystal River Unit 3 (CR-3). By letter dated September 30, 1998, Florida Power Corporation submitted proposed changes to the licensing bases for CR-3. The proposal reflects the capability of the CR-3 gaseous radioactivity monitor to detect a 1 gallon per minute leak in approximately 14 hours rather than the previously stated 1 hour.

A copy of the related Safety Evaluation is also 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, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosures: 1. Amendment No. 179 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

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Sincerely,

A handwritten signature in black ink, appearing to read "L A Wiens".

Leonard A. Wiens, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-302

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2. Safety Evaluation

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Mr. John Paul Cowan
Florida Power Corporation

CRYSTAL RIVER UNIT NO. 3

cc:

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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

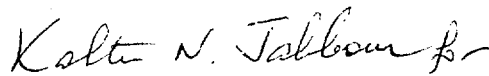
Amendment No. **179**
License No. DPR-72

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Florida Power Corporation, et al. (the licensees), dated September 30, 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

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- 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, changes to the updated Final Safety Analysis Report (FSAR) and associated Technical Specification Bases, to state that the gaseous radioactivity monitor would require approximately 14 hours to detect a 1 gallon per minute leak from the reactor coolant system, as set forth in the application for amendment by Florida Power Corporation dated September 30, 1998, are authorized. The licensee shall submit the revised description authorized by this amendment with the next update of the FSAR and Technical Specification Bases in accordance with 10 CFR 50.71(e).
 3. This license amendment is effective as of its date of issuance and shall be implemented as specified in (2) above.

FOR THE NUCLEAR REGULATORY COMMISSION



Sheri R. Peterson, Chief, Section 2
Project Directorate II
Division of Project Licensing Management
Office of Nuclear Reactor Regulation

Date of Issuance: **June 14, 1999**

ATTACHMENT TO LICENSE AMENDMENT NO. 179

TO FACILITY OPERATING LICENSE NO. DPR-72

DOCKET NO. 50-302

Replace the following page of the Appendix "A" Technical Specifications with the enclosed page. The revised page is identified by amendment number and contains a vertical line indicating the area of change.

Remove Page

B 3.4-65

Insert Page

B 3.4-65

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.14 RCS Leakage Detection Instrumentation

BASES

BACKGROUND

10 CFR 50, Appendix A, GDC 30, (Ref. 1) requires means be provided for detecting and, to the extent practical, identifying the location of the source of RCS LEAKAGE. Regulatory Guide 1.45 (Ref. 2) describes acceptable methods for selecting leakage detection systems.

Leakage detection systems must have the capability to detect reactor coolant pressure boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure. Thus, an early indication or warning signal is necessary to permit proper evaluation of all unidentified LEAKAGE.

The containment sump collects unidentified LEAKAGE and is instrumented to alarm on increasing level and has the capability to detect a leakage rate of 1 gpm in less than 1 hour. This sensitivity is acceptable for detecting increases in unidentified LEAKAGE.

The reactor coolant contains radioactivity that, when released to the containment, can be detected by radiation monitoring instrumentation. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. Instrument sensitivities of 10^{-9} $\mu\text{Ci}/\text{cc}$ radioactivity for particulate monitoring and of 10^{-6} $\mu\text{Ci}/\text{cc}$ radioactivity for gaseous monitoring are adequate for these leakage detection systems. The particulate monitoring channel is capable of detecting a change in RCS leak rate of 1 gpm within one hour based on activity levels assumed in the environmental report (0.1% failed fuel). The predominant nuclide of detection for the particulate channel is Rb-88. The gaseous channel requires significantly more time to detect the same change in RCS leak rate (approximately 14 hours). This is due to the relatively long half-life of its predominant nuclide of detection, Xe-133.

Other installed instrumentation such as RB pressure and Containment Cooling Fan condensate flow also indicate leakage into containment. These are potentially valuable

(continued)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. DPR-72

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

1.0 INTRODUCTION

By letter dated September 30, 1998 (Reference 1), Florida Power Corporation (FPC), the licensee, requested a license amendment change for Crystal River Unit 3. The license amendment would correct the description of the reactor coolant system (RCS) leakage detection capability of the reactor building atmosphere gaseous radioactivity monitor in the Improved Technical Specification (ITS) Bases and the Final Safety Analysis Report (FSAR). The current description states that the gaseous radioactivity monitor can detect 1 gpm in 1 hour. According to the licensee event reports (LERs) (References 2 and 3), FPC personnel discovered that the gaseous radioactivity monitor was not capable of detecting a 1 gpm RCS leak within 1 hour but rather 1 gpm in 14 hours. Therefore, the proposed change would state that the Crystal River Unit 3 gaseous radioactivity monitor can detect a 1 gpm RCS leak in approximately 14 hours.

2.0 EVALUATION

On July 30, 1997, FPC personnel discovered that the RM-A6 particulate and gaseous radioactivity monitor's sensitivity was configured to iodine detection mode only and was incapable of detecting particulate radioactivity. On November 25, 1997, FPC personnel also determined that the gaseous radioactivity monitor was not capable of detecting a 1 gpm RCS leak in 1 hour. The Crystal River Unit 3 ITS 3.4.14 requires that the reactor building sump level and reactor building atmosphere radiation monitoring (particulate or gaseous) leakage detection systems be operable in modes 1, 2, 3, and 4. According to the licensee's LERs, a new RM-A6 particulate monitor has been installed. In addition, the RM-A6 gaseous radioactivity monitor has been entered into the Operation Equipment Out of Service log to ensure compliance with ITS 3.4.14.

In its license amendment submittal, the licensee stated that both the reactor building sump level and the particulate radioactivity monitor leakage detection systems are capable of detecting a 1 gpm leak within 1 hour. This assumes that the RCS radioactivity is equivalent to 0.1 percent failed fuel, as discussed in the Environmental Report (Reference 4) for the particulate radioactivity monitor. The staff notes that normal RCS radioactivity levels are below 0.1 percent failed fuel. Based on this information, the staff concludes that ITS 3.4.14 is being met at Crystal River Unit 3.

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ENCLOSURE 2

In its submittal, the licensee proposed to change the ITS Bases B 3.4.14 and FSAR Section 4.2.3.8 to more accurately describe the capability of the gaseous radioactivity monitor. The proposed wording is as follows:

The particulate monitoring channel is capable of detecting a change in RCS leak rate of 1 gpm within 1 hour, based on activity levels assumed in the Environmental Report (0.1% failed fuel). The predominant nuclide of detection for the particulate channel is Rb-188. The gaseous channel requires significantly more time to detect the same change in RCS leak rate (approximately 14 hours). This is due to the relatively long half-life of its predominant nuclide of detection, Xe-133.

To support its request, the licensee described other diverse methods of leak detection available at Crystal River Unit 3. These include makeup tank level, cooler condensate flow from each reactor building cooling unit (RBCU), reactor building pressure, and RCS inventory balance. The licensee stated that makeup tank level is displayed and recorded in the control room. The licensee has calculated that a decrease of 1.9 inches per hour of makeup tank level is equivalent to 1 gpm of RCS leakage. The RBCU condensate flow is also monitored and alarmed in the control room. The licensee stated that the RBCU condensate flow switches have a setpoint of 1133 cc/min (0.3 gpm) and will provide indication of increasing humidity in the reactor building. The current alarm response procedures at Crystal River Unit 3 list RCS leakage inside containment as a potential cause of high condensate flow alarms.

Regulatory Guide (RG) 1.45 (Reference 5) provides the staff's position on reactor coolant pressure boundary leakage detection systems. In particular, regulatory positions 3 and 5, below, are applicable to the FPC request.

3. At least three separate detection methods should be employed and two of these methods should be (1) sump level and flow monitoring and (2) airborne particulate radioactivity monitoring. The third method may be selected from the following:

- a. Monitoring of condensate flow rate from air coolers,
- b. Monitoring of airborne gaseous radioactivity.

Humidity, temperature, or pressure monitoring of the containment atmosphere should be considered as alarms or indirect indication of leakage to the containment.

5. The sensitivity and response time of each leakage detection system in regulatory position 3 above employed for unidentified leakage should be adequate to detect a leakage rate, or its equivalent, of 1 gpm in less than 1 hour.

In addition, RG 1.45 states that it is acceptable to use the values in the plant environmental report in analyzing the sensitivity of airborne particulate or gaseous radioactivity leak detection system. Based on the discussion above, the staff concludes that Crystal River Unit 3 has met the intent of RG 1.45. Regulatory position 3 is met by compliance with ITS 3.4.14 and monitoring the condensate flow from the RBCUs. Regulatory position 5 is met as long as the RCS activity is equivalent to 0.1 percent failed fuel. Additionally, the staff believes that changing the description of the gaseous radioactivity monitor's capabilities to the "as-is"

RCS activity is equivalent to 0.1 percent failed fuel. Additionally, the staff believes that changing the description of the gaseous radioactivity monitor's capabilities to the "as-is" condition of detecting 1 gpm of RCS leakage in 14 hours is acceptable based on the diverse methods of leak detection that are available.

3.0 STATE CONSULTATION

Based upon a letter dated March 8, 1991, from Mary E. Clark of the State of Florida, Department of Health and Rehabilitative Services, to Deborah A. Miller, Licensing Assistant, U.S. NRC, the State of Florida does not desire notification of issuance of license amendments.

4.0 ENVIRONMENTAL CONSIDERATIONS

The amendment changes requirements 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 amendments involve 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 64116). 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.

5.0 CONCLUSIONS

The staff has reviewed FPC's submittal and supporting documentation. The staff has concluded that Crystal River Unit 3 has met the intent of RG 1.45 and ITS 3.4.14. Therefore, the staff finds that the proposed change in the description of the gaseous radioactivity monitor's capabilities in the ITS Bases 3.4.14 and FSAR is acceptable. 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: K. Kavanagh

Date: June 14, 1999

6.0 REFERENCES

1. Terry, J.H., Florida Power Corporation, to USNRC, "License Amendment Request #238, Revision to Licensing Basis for Reactor Coolant System Leakage Detection Instrumentation," September 30, 1998.
2. Rencheck, M.W., Florida Power Corporation, to USNRC, "Licensee Event Report (LER) 50-302/97-042-00," December 17, 1997.
3. Baumstark, J. S., Florida Power Corporation, to USNRC, "Licensee Event Report (LER) 50-302/97-042-01," June 15, 1998.
4. Rodgers, J. T., Florida Power Corporation, to USNRC, "Crystal River Unit 3 Environmental Report," January 4, 1972. US Atomic Energy Commission Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.