August 16, 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 CONTAINMENT CLOSURE REQUIREMENTS DURING REFUELING OPERATIONS (TAC NO. MA4344)

Dear Mr. Cowan:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No.184 to Facility Operating License No. DPR-72 for Crystal River Unit 3 (CR-3). This amendment is in response to a Florida Power Company (FPC) request dated November 30, 1998. The FPC submittal requested approval for changes to the CR-3 Improved Technical Specifications to allow both doors of the containment personnel air lock to be open during fuel movement and adds a provision for an outage equipment hatch.

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:
L. 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. 184 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 16, 1999

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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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. 184
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 November 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

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. 184, 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 and shall be implemented within 30 days.

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: August 16, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 184

TO FACILITY OPERATING LICENSE NO. DPR-72

DOCKET NO. 50-302

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

Remove Page	Insert Page
3.9-4	3.9-4
B 3.9-9	B 3.9-9
B 3.9-10	B 3.9-10
B 3.9-11	B 3.9-11
B 3.9-12	B 3.9-12
B 3.9-13	B 3.9-13

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch or outage equipment hatch (OEH) installed and held in place by four bolts;

b. A minimum of one door in each air lock and the door in the OEH (if installed) closed, or capable of being closed by a designated individual readily available to close the open door; and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent. These penetrations may be open provided the total calculated flow rate out of the open penetration(s) is less than or equal to the equivalent flow rate through a 48 inch containment purge line penetration; or

2. capable of being closed by an OPERABLE containment purge or mini-purge valve.

APPLICABILITY: During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2 Suspend movement of irradiated fuel assemblies within containment.	Immediately

B 3.9 REFUELING OPERATIONS

B 3.9.3 Containment Penetrations

BASES

BACKGROUND

An accident which occurs during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment will have any released radioactivity limited from escaping to the environment. In MODE 6, the potential for containment pressurization as a result of an accident is not likely; therefore, the requirement to isolate the containment from the outside atmosphere is less stringent than those established for MODES 1 through 4. In order to make this distinction, the penetration requirements are referred to as "containment closure" rather than "containment OPERABILITY." Containment closure means that all potential escape paths for radioactivity are closed or capable of being closed.

The containment equipment hatch or outage equipment hatch (OEH) provides a means for moving large equipment and components into and out of containment. During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, the equipment hatch or OEH must be held in place by at least four bolts. The required number of bolts is based on dead weight and is acceptable due to the low likelihood of a pressurization event. Good engineering practice dictates that the bolts required by this LCO be approximately equally spaced. During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, containment closure is required; therefore, the door in the OEH (if installed) must always remain closed or be capable of being closed.

The containment air locks provide a means for personnel access during MODES 1, 2, 3, and 4 in accordance with LCO 3.6.2, "Containment Air Locks." Each air lock has a door at both ends. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is required. However, during periods of unit shutdown when containment OPERABILITY is not required, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent containment ingress and egress is necessary. During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, containment closure is required; therefore, the door interlock mechanism may remain disabled, but one air lock door must always remain closed or be capable of being closed.

(continued)

BASES

BACKGROUND (continued)

If the door in the OEH (if installed) or both doors in the containment air locks are open when containment closure is required, a designated individual must be readily available to close the door in the OEH and at least one door in each air lock. Operations personnel directly involved in refueling operations shall be aware of the identity of the designated individual(s). The designated individual(s) shall remain within sufficient proximity to the open doors to assist in evacuation of personnel inside containment and to close the open door(s) as soon as evacuation is completed.

The requirements on containment penetration closure ensure that a release of fission product radioactivity to the environment from the containment will be limited. The closure restrictions are sufficient to limit fission product radioactivity release from containment due to a fuel handling accident during refueling.

In MODE 6, it is necessary to periodically recirculate/ exchange RB atmosphere in order to minimize radiation uptake during the conduct of refueling operations. The 48 inch purge valves are normally used for this purpose, but the mini-purge valves may be relied upon as well. Both valve types are automatically isolated on a unit vent-high radiation signal (from RMA-1). So long as one valve in the flow path is OPERABLE, these lines may remain unisolated during the subject plant conditions.

The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated by a minimum of one isolation device. Isolation may be achieved by an automatic or manual isolation valve, blind flange, or equivalent. Equivalent isolation methods include use of a material (e.g., temporary sealant) that can provide a temporary, atmospheric pressure ventilation barrier for the other containment penetrations during fuel movements.

These penetrations may be open provided the total calculated flow rate out the open penetrations is less than or equal to the equivalent flow rate through a 48 inch containment purge line penetration. This allowance is consistent with the CR-3 fuel handling accident inside the reactor building. The licensing basis analysis assumed a puff release of radionuclides from the RB following the FHA event. No credit was taken for the RB purge filters. Limiting the flow rate out the open penetrations to a flow rate less than or equal to the flow rate through the RB purge system is reasonable and conservative, given the plant licensing basis. Offsite doses from this analysis were well within 10 CFR 100 limits. With the containment purge valves OPERABLE, no leakage value has to be assigned to these penetrations, and the entire

(continued)

BASES

BACKGROUND (continued)

50,000 cfm can be allocated to other penetrations providing direct access. With the containment purge valves inoperable, these valves are allowed to be open during the Applicability of this Specification, however; no additional penetrations are allowed to be un-isolated during this time.

APPLICABLE SAFETY ANALYSES

During CORE ALTERATIONS or movement of fuel assemblies within containment with irradiated fuel in containment, the most severe radiological consequences result from a fuel handling accident. The fuel handling accident is a postulated event that involves damage to irradiated fuel (Ref. 1). Fuel handling accidents include dropping a single irradiated fuel assembly and handling tool or a heavy object onto other irradiated fuel assemblies. The requirements of LCO 3.9.6, "Refueling Canal Water Level," the administrative limit on minimum decay time of 72 hours prior to the movement of irradiated fuel in the vessel, and this LCO ensure that the release of fission product radioactivity subsequent to a fuel handling accident results in doses that are within the requirements specified in 10 CFR 100.

Containment penetrations satisfy Criterion 3 of the NRC Policy Statement.

LCO

This LCO limits the consequences of a fuel handling accident in containment by limiting the potential escape paths for fission product radioactivity from containment. The LCO requires any penetration providing direct access from the containment atmosphere to the outside atmosphere to be closed or capable of being closed except for penetrations containing an OPERABLE purge or mini-purge valve. For the containment air locks and the OEH (if installed), both doors in the air locks and the door in the OEH may be open only under administrative controls. For the containment purge and mini-purge valves to be considered OPERABLE, these valves (penetrations) must be automatically isolable on a unit vent-high radiation isolation signal.

The definition of "direct access from the containment atmosphere to the outside atmosphere" is any path that would allow for transport of containment atmosphere to any atmosphere located outside the containment structure. This includes the Auxiliary Building. As a general rule, closed or pressurized systems do not constitute a direct path

(continued)

BASES

LCO (continued)

between the RB and outside environments. All permanent and temporary penetration closures should be evaluated to assess the possibility for a release path to the outside environment. For the purpose of determining what constitutes a "direct access" path, no failure mechanisms should be applied to create a scenario which results in a "direct access" path. For example, line breaks, valve failures, power losses or natural phenomenon should not be postulated as part of the evaluation process.

These penetrations may be open provided the total calculated flow rate out the open penetrations is less than or equal to the equivalent flow rate through a 48 inch containment purge line penetration.

APPLICABILITY

The containment penetration requirements are applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment because this is the period of highest risk potential for a fuel handling accident. In MODES 1, 2, 3, and 4, containment penetration requirements are addressed by LCO 3.6.1, "Containment." When CORE ALTERATIONS or movement of irradiated fuel assemblies within containment are not being conducted, the potential for a fuel handling accident does not exist. Therefore, under these conditions no requirements are placed on containment penetration status.

ACTIONS

A.1 and A.2

With the containment equipment hatch, OEH, air locks, or any containment penetration that provides direct access from the containment atmosphere to the outside atmosphere not in the required status, including failure to implement required administrative controls for open OEH and air lock doors and the containment purge or mini-purge valve penetrations not capable of automatic isolation when the penetrations are unisolated, the plant must be placed in a condition in which the isolation function is not

(continued)

BASES

ACTIONS

A.1 and A.2 (continued)

needed. This is accomplished by immediately suspending CORE ALTERATIONS and movement of irradiated fuel assemblies within containment. Performance of these actions shall not preclude moving a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position, and that administrative controls required for open OEH and air lock doors are being implemented.

The Surveillance is performed every 7 days during CORE ALTERATIONS or movement of irradiated fuel assemblies within the containment. The Surveillance interval is selected to be commensurate with the normal duration of time to complete fuel handling operations.

SR 3.9.3.2

This Surveillance demonstrates that each containment purge and mini-purge valve actuates to its isolation position on an actual or simulated high radiation signal. The 24 month Frequency is consistent with other similar instrumentation and valve testing requirements. The Surveillance ensures that the valves are capable of closing after a postulated fuel handling accident to limit a release of fission product radioactivity from the containment. SR 3.6.3.5 demonstrates that the isolation time of each valve is in accordance with the Inservice Testing Program requirements.

REFERENCES

1. FSAR, Section 14.2.2.3.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 184 TO FACILITY OPERATING LICENSE NO. DPR-72

CONTAINMENT CLOSURE REQUIREMENTS DURING REFUELING

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

1.0 INTRODUCTION

By letter dated November 30, 1998, the Florida Power Corporation (FPC or the licensee) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for changes to the Crystal River Unit 3 Improved Technical Specifications (ITS). The proposed amendment modifies the Crystal River Unit 3 Limiting Condition for Operation (LCO) 3.9.3 as follows: (1) TS LCO 3.9.3.a is revised to recognize the possible installation of the outage equipment hatch (OEH) instead of the normal equipment hatch during refueling outages; and (2) TS LCO 3.9.3.b is revised to require that at least one door in each personnel air lock and a single door in the OEH are closed, or capable of being closed, during refueling operations. If both doors of either air lock are open during refueling operations, a designated individual must be readily available to close at least one air lock door following the evacuation that would occur in the event of an accident. If the door in the OEH is open during refueling operations, a designated individual must be readily available to close the door in the OEH following the evacuation that would occur in the event of an accident.

FPC indicated that allowing these doors to be open during core alterations or the movement of irradiated fuel inside containment is expected to reduce costs associated with reactor refueling or other activities. The licensee also states that the ability to open these doors under administrative controls will assist in the maintenance of cleanliness and housekeeping, and will provide a safer work environment inside containment.

2.0 EVALUATION

2.1 LCO 3.9.3.a, Outage Equipment Hatch

The OEH is designed to replace the normal equipment hatch during refueling outages. The OEH provides equivalent closure of the containment during refueling mode activities, compared to that provided by the equipment hatch, except that the OEH is not equivalent as a pressure-retaining device. However, pressurization events are unlikely during refueling mode activities. Therefore, without differential pressure providing a driving force to push radioactive material past the OEH, the OEH will provide adequate containment closure when properly installed during refueling mode activities.

Thus, we find that the OEH provides an appropriate level of protection against release of radioactive material during a fuel handling accident. Consequently, we find that proposed LCO 3.9.3.a is acceptable.

2.2 LCO 3.9.3.b, Doors Open During Fuel Movement

The licensee proposes to allow both doors in the air lock to remain open during fuel movement. Also, the personnel door in the OEH would be allowed to remain open during fuel movement. Numerous plants have been granted this TS change for their air locks in the last few years. The allowance to have the air lock doors open during fuel movement has been based on (1) dose calculations of a fuel handling accident which indicate acceptable radiological consequences and (2) commitments from the licensee to implement administrative procedures that ensure that the open air lock can and will be promptly closed following containment evacuation in the event of a refueling accident (even though the containment fission product control function may not be required to meet acceptable dose consequences).

2.2.1 Dose Calculations

In support for the proposed Improved Technical Specification change, the licensee has evaluated the radiological consequences of fuel handling accidents. In performing this analysis the licensee concluded that the proposed change did not affect any of the assumptions or inputs previously used to analyze the fuel handling accident. The licensee was able to make the above conclusion since the fuel handling accident analysis did not take credit for filtering of the released radioactive material or containment closure.

The staff reviewed the licensee's conclusion and performed a confirmatory calculation to check whether or not the proposed changes will affect the radiological consequences to the control room operators and to the public.

The staff's calculation confirmed that the thyroid doses at the Exclusion Area Boundary (EAB), Low Population Zone (LPZ), and control room from the fuel handling accident meets the acceptance criteria. The parameters which the staff utilized in its assessment are presented in Table 1. The staff calculated a dose of 39.67 rem thyroid at the EAB ,and 3.5 rem thyroid at the LPZ. The acceptance criteria at the EAB and LPZ for this accident are contained in Standard Review Plan (SRP) Section 15.7.4 of NUREG-0800 (75 rem thyroid dose; 25% of 10 CFR Part 100 guideline of 300 rem). The staff calculated the resulting dose to the control room operator to be 9.033 rem thyroid. The acceptance criterion for the control room operator is 30 rem thyroid (SRP Section 6.4 of NUREG-0800). The staff agrees with the licensee, that the proposed change will not affect any of the assumptions used to analyze the fuel handling accident. Therefore, the proposed change is acceptable.

2.2.2 Administrative Procedures

The licensee has included the appropriate administrative procedures in the proposed ITS for the air lock doors and the OEH door. The staff finds these administrative controls adequate to ensure closure of the containment openings when required.

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 (64 FR 4156). 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 CONCLUSION

Based on its review of the licensee's proposal concerning containment closure requirements during refueling operations, the staff has determined that the proposed changes will provide an adequate level of protection against release of radioactive material during a fuel handling accident and therefore are 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 Contributors: J. Pulsipher, NRR
R. Tadesse, NRR

Date: August 16, 1999

Table 1

ASSUMPTIONS USED FOR CALCULATING RADIOLOGICAL CONSEQUENCES

Parameters	Quantity
Power Level (Mwt)	2620
Number of Fuel Rods Damaged	208
Total Number of Fuel Rods	36816
Shutdown Time, Hours	72
Power Peaking Factor	1.8
Receptor Point Variables	
Atmosphere Relative Concentration, X/Q (sec/M^3)	
Exclusion Area Boundary 0-2 hours	1.60E-4
Low Population Zone, duration	1.40E-4
Control Room	
Control Room Volume, cubic feet	364922
Recirculation Flow, ft^3/min	37800
Control Room Infiltration, cfm	524
Recirculation Filter Delay, minutes	30
Recirculation Filtration, %	95
Atmosphere Relative Concentration, X/Q (sec/M^3)	
0 - 8 hours	9.OOE-4
8.24 hours	5.31 E-4
24 - 96 hours	2.07E-4
96-720 hours	5.94E-5

Note: Dose conversion factors from ICRP-30 were utilized for all calculations.

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Florida Power Corporation

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