

October 29, 1997

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

SUBJECT: CRYSTAL RIVER 3 - EXEMPTION FROM CERTAIN REQUIREMENTS OF 10 CFR 50,
APPENDIX R, FIRE PROTECTION PROGRAM FOR NUCLEAR POWER FACILITIES
(TAC NO. M95817)

Dear Mr. Anderson:

The Commission has issued the enclosed exemption from certain requirements of 10 CFR 50, Appendix R, Section III.G. in response to your request dated June 21, as supplemented November 22, 1996. This exemption allows the use of automatic fire detection and enhanced sprinkler protection in certain areas instead of fire barrier upgrades.

Please note that the enclosed exemption does not address your request relating to the requirements for battery powered lighting in areas for the operation of safe shutdown equipment.

A copy of this Exemption has been 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: Exemption

cc w/enclosure: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 29, 1997

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Sincerely,

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

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

Docket No. 50-302

Enclosure: Exemption

cc w/enclosure: See next page

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Florida Power Corporation

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
FLORIDA POWER CORPORATION) Docket No. 50-302
)
Crystal River Nuclear Generating)
Plant Unit 3)
)

EXEMPTION

I.

Florida Power Corporation (the licensee) is the holder of Facility Operating License No. DPR-72, which authorizes operation of the Crystal River Nuclear Generating Plant Unit 3 (CR3). The license provides, among other things, that the licensee is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

The facility is of a pressurized water reactor type and is located in Citrus County, Florida.

II.

In its letter dated June 21, as supplemented November 22, 1996, the licensee requested an exemption from the Commission's regulations.

Title 10 of the Code of Federal Regulations, Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," Criterion 3, "Fire Protection," specifies that "Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions." 10 CFR Part 50, Appendix R sets forth the fire protection features required to satisfy the general design Criterion 3 of the Commission's regulations. Pursuant to 10 CFR Part 50, Appendix R, Section III, Paragraph G, design

features shall be established that are capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown conditions is free of fire damage. Specifically, 10 CFR Part 50, Appendix R, Paragraph III.G.2.c requires (if Paragraphs III.G.2.a or b are not applicable) enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating; in addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

The current CR3 design includes Thermo-Lag fire barriers which do not provide the level of fire resistance required by NRC regulations. As part of its program for resolving Thermo-Lag issues, the licensee has determined that the Thermo-Lag material used as a fire barrier for the protection of certain safe shutdown cables located in certain elevations of the auxiliary and intermediate buildings does not qualify as 1-hour fire rated barriers. In lieu of upgrading the existing Thermo-Lag fire barriers to satisfy the 1-hour fire rating requirement, the licensee proposes to implement an enhanced automatic fire suppression system coverage for these specific fire zones. The licensee indicates that its proposed enhanced automatic fire suppression system coverage coupled with the existing Thermo-Lag barriers and other defense-in-depth features will ensure that one train of equipment necessary to achieve hot shutdown remains free of fire damage. An exemption from 10 CFR Part 50, Appendix R, Section III, Paragraph G.2.c., is required to allow the use of the existing Thermo-Lag material that has less than a 1-hour fire rating, for the specific cables and equipment located in certain elevations of the auxiliary and intermediate buildings. By letter dated June 21, as supplemented November 22, 1996, the licensee submitted the exemption request.

This exemption does not address the licensee's request relating to the requirements for battery powered lighting in areas for the operation of safe shutdown equipment.

III.

DISCUSSION

The exemption request is for the following fire zones: auxiliary building fire area AB-95-3B and G, AB-119-6A (elevations 95 and 119) and the intermediate building fire area IB-119-201A (elevation 119). Automatic sprinkler protection and automatic fire detection designed and installed in accordance with the applicable National Fire Protection Association (NFPA) codes and standards are provided in these fire zones. The licensee, in its response to the U.S. Nuclear Regulatory Commission (NRC) staff's request for additional information (RAI) dated September 24, 1996, identified no significant deviations from the applicable NFPA codes and standards that would adversely affect system performance. The licensee has proposed upgrading the existing automatic sprinkler protection in each of these zones to compensate for the existing Thermo-Lag fire barriers. The licensee has determined that the existing Thermo-Lag fire barriers, coupled with the enhanced sprinkler protection and administrative controls, provide an adequate level of fire protection. The staff's evaluation of the licensee's exemption request is discussed below.

Auxiliary building hallway AB-95-3BA:

This zone is the main east/west corridor for this elevation of the auxiliary building. The corridor is approximately 9 feet wide and the ceiling is approximately 26 feet above the floor level. An open stairway at the east end of this fire zone leads up to elevation 119 of the auxiliary building (AB-

119-6A) and is open to adjacent fire zones at each end. The remainder of the zone is bounded by 3-hour fire walls on the north, east, and west. The ceiling and floor are also 3-hour fire rated barriers. The south wall is a non-fire rated concrete barrier with unsealed penetrations. The fire hazards in this zone include cables, electrical cabinets and an air conditioning unit. The safe shutdown circuits located in this zone are associated with the makeup system and battery charging. The unprotected redundant circuits are within 5 feet of the Thermo-Lag protected cables. The fire protection features provided for this zone include a wet pipe sprinkler system, hose station, and smoke detection. The licensee has performed an engineering evaluation that concluded that the Thermo-Lag fire barriers in this zone have an equivalent fire rating of 23 to 48 minutes.

Auxiliary building hallway AB-95-3G:

This is a north/south corridor providing access to the make-up pump cubicles. This zone is enclosed by non-fire rated concrete walls ranging from 24 to 36 inches thick. The floor and ceiling are 3-hour rated fire barriers. The fire hazards in this zone include cables and electrical cabinets. The safe shutdown circuits located in this zone are associated with the makeup system and battery charging. The unprotected redundant circuits are within 1 foot of the Thermo-Lag protected cables. The fire protection features provided for this zone include a wet pipe sprinkler system, hose station, and smoke detection. The licensee has performed an engineering evaluation that concluded that the Thermo-Lag fire barriers in this zone have an equivalent fire rating of 23 to 48 minutes.

Auxiliary building hallway AB-95-3G:

This zone is the main east/west corridor for this elevation of the auxiliary building. The corridor is approximately 9 feet wide and 40 feet high. An open stairway at the east end of this fire zone leads down to elevation 95 of the auxiliary building (AB-95-3B) and is open to adjacent fire zones at each end. The remainder of the zone is enclosed by 3-hour fire walls on the north, east and west side, a 3-hour fire rated floor and a 36-inch thick concrete non-fire rated ceiling and south wall. The fire hazards in this zone include cables and fan motors. The safe shutdown circuits located in this area are associated with the makeup system, heating ventilation and air conditioning (HVAC), instrumentation, battery charging and essential power supplies. The unprotected redundant circuits are greater than 20 feet from the Thermo-Lag protected cables; however, intervening combustibles are present. The fire protection features provided for this zone include a wet pipe sprinkler system, hose station, and smoke detection. The licensee has performed an engineering evaluation that concluded that the Thermo-Lag fire barriers in this zone have an equivalent fire rating of 23 to 39 minutes.

Intermediate building industrial cooler room IB-119-201A:

This zone connects the industrial room cooler to the auxiliary building and is located between the turbine building and the reactor building. The corridor is a narrow hallway with a ceiling approximately 26 feet high. This zone is separated from the turbine building by a 3-hour rated wall. The zone is also separated from the reactor building by a non-fire rated concrete wall approximately 42 inches thick. The east side of this zone is adjacent to fire zone IB-119-201B, separated by a "jailbar" door. The fire hazards in this zone include cables and electrical cabinets. The safe shutdown circuits

located in this zone are associated with instrumentation. The unprotected redundant circuits are within 3 feet of the Thermo-Lag protected cables. The fire protection features provided for this zone include a wet pipe sprinkler system, hose station, and smoke detection. The licensee has performed an engineering evaluation that concluded that the Thermo-Lag fire barriers in this zone have an equivalent fire rating of 22 to 36 minutes.

Intermediate building personnel hatch IB-119-201B:

This zone connects the industrial cooler room with the auxiliary building. The floor area is approximately 1100 square feet. The north, east and part of the south wall have a 3-hour fire rating. The remaining portion of the south wall is the reactor building non-fire rated concrete wall approximately 42 inches thick. The fire hazards in this zone are cables and protective clothing storage. The safe shutdown circuits located in this zone are associated with instrumentation. The unprotected redundant circuits are within 20 feet of the Thermo-Lag protected cables. The fire protection features provided for this zone include a wet pipe sprinkler system, hose station, and smoke detection. The licensee has performed an engineering evaluation that concluded that the Thermo-Lag fire barriers in this zone have an equivalent fire rating of 22 to 36 minutes.

IV.

EVALUATION

A fire on the 95 or 119 elevations of the auxiliary building could cause the loss of the redundant divisions of the makeup system, HVAC, instrumentation, battery charging or essential power supplies. A fire on the 119 elevation of the intermediate building could cause the loss of redundant

divisions of instrumentation needed to achieve and maintain safe shutdown following a fire.

The licensee has committed to upgrade the existing sprinkler protection on elevations 95 and 119 of the auxiliary building and on elevation 119 of the intermediate building in the vicinity of the Thermo-Lag fire barriers that are the subject of this exemption request. The additional sprinkler protection, coupled with the existing automatic detection and suppression, and manual fire suppression capability provided in these fire zones, would provide reasonable assurance that an exposure fire from in situ or transient combustible materials in the vicinity of the Thermo-Lag fire barriers will not challenge the barriers, such that damage to redundant divisions of systems and instrumentation needed to achieve and maintain safe shutdown following a fire will not occur. Due to variations in the important parameters of the installed Thermo-Lag barriers from the tested barriers, and deviations in the conduct of the industry-sponsored fire endurance tests from the guidance provided in Supplement 1 to Generic Letter 86-10, the equivalent fire resistance rating of the Thermo-Lag fire barriers at Crystal River Unit 3, that are the subject of this exemption request, is indeterminate. However, based on data obtained from industry-sponsored fire test programs, the staff estimates that the existing Thermo-Lag barriers would provide a minimum of 20 minutes of fire resistance. The licensee has committed to maintain the Thermo-Lag fire barriers that are the subject of this request in place. Automatic wet pipe sprinkler protection that is designed, installed and maintained in accordance with NFPA 13, "Installation of Sprinkler Systems," have historically demonstrated a high reliability in controlling fires during the incipient stage, thereby limiting fire damage and propagation until

extinguishment can be achieved through manual actions. The licensee has stated that an upgrade of the existing Thermo-Lag fire barriers to achieve literal compliance with the regulation is not feasible due to the locations of the raceways; however, the protection provided by the existing Thermo-Lag and supplemented with fire suppression capability by the additional sprinkler heads would protect one train of safe shutdown cables and satisfy the underlying purpose of the rule. On the basis of its review and evaluation of the technical information provided in the licensee's exemption request and the licensee's response to the request for additional information, the NRC staff concludes that the licensee's proposed alternative means of protection coupling the existing barriers with enhanced suppression capability provides a level of safety equivalent to that prescribed by the regulation.

IV

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security and (2) when special circumstances are present. Special circumstances are present whenever, according to 10 CFR 50.12(a)(2)(ii), "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule."

The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G, Fire Protection of Safe Shutdown Capability, is to ensure the capability to achieve and maintain safe shutdown conditions during and after any postulated fire in the plant. The staff has concluded that the licensee's proposed

alternative means of protection, as described in its request for exemption from the technical requirements of Section III.G.2.c for auxiliary building fire area AB-95-3B and G, AB-119-6A (elevations 95 and 119) and the intermediate building fire area IB-119-201A (elevation 119), would provide reasonable assurance that a level of safety equivalent to that specified by the regulation would be met. Therefore, application of the one hour barrier requirement under the above circumstances is not necessary to achieve the underlying purpose of the rule.

V.

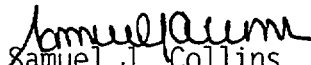
In consideration of the foregoing, the NRC staff has concluded that the licensee's proposed use of an enhanced automatic fire suppression system coverage for these specific areas in lieu of upgrading the existing Thermo-Lag fire barriers to satisfy the 1-hour fire rating requirement, is authorized by law, will not present an undue risk to public health and safety and is consistent with the common defense and security. The NRC staff has determined that there are special circumstances present, as specified in 10 CFR 50.12(a)(2)(ii), in that application of 10 CFR 50, Appendix R, Section III G.2.c, is not necessary in order to achieve the underlying purpose of this regulation.

Accordingly, the Commission hereby grants, pursuant to 10 CFR 50.12(a), the requested exemption. The granting of this exemption is contingent upon (1) the installation of the enhanced fire suppression capability as described in the licensee's request, and (2) maintaining in place the existing fire barriers that are the subject of this exemption.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (62 FR 56207).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 29th day of October 1997

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FOR THE NUCLEAR REGULATORY COMMISSION

**Original signed by
Samuel J. Collins**

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 29th day of October 1997

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