

November 19, 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  
PART 50, APPENDIX R, FIRE PROTECTION PROGRAM FOR NUCLEAR POWER  
FACILITIES (TAC NO. M99560)

Dear Mr. Anderson:

The Commission has issued the enclosed exemption from certain requirements of Section III.0 of Appendix R to Part 50 of Title 10 of the Code of Federal Regulations relating to the reactor coolant pump oil collection system, in response to your request dated September 5, 1997. Specifically, your request was related to the remote oil addition lines which were installed in 1985 without an oil collection system.

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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B. Boger

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

November 19, 1997

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Sincerely,

A handwritten signature in black ink, appearing to read "L. Raghavan", written over a horizontal line.

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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Atlanta, GA 30303-3415

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 September 5, 1997, 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 certain provisions of General Design Criterion 3 of the Commission's regulations. Pursuant to 10 CFR Part 50, Appendix R, Section III, Paragraph O, "Oil Collection System for Reactor Coolant Pump," reactor coolant pumps (RCPs) shall be equipped with an oil

collection system which "...shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems."

In 1985, CR3 added remote oil addition lines (ROALs) to the original RCP oil fill lines to eliminate the need to shutdown the reactor, and to reduce personnel radiation and heat stress exposure during periodic RCP oil additions. At that time, the licensee did not consider the ROALs to be a part of the RCP lube oil systems and as a result, did not provide a lube oil collection system to collect potential leakages. As part of its current Appendix R design review project, the licensee has now determined the ROALs to be a part of the RCP lube oil systems and therefore, would require a lube oil collection system.

The licensee states that the ROALs are of a rugged leak tight design. They are used only periodically using controlled plant procedures. In a hypothetical worst case spill, with ignition assumed, use of the ROALs does not impact post fire safe shutdown capability. As a result, the licensee believes that a lube oil collection system for the ROALs is not necessary to achieve the underlying purpose of the rule. Exemption from Appendix R, Paragraph O, requirements is required for the ROALs to have no lube oil collection system for collecting oil from potential leak sites.

### III.

#### DISCUSSION

The licensee requests an exemption from the technical requirements relating to an oil collection system for the ROALs associated with the RCPs.

CR3 design includes four RCP motors which are located inside the D-Ring area. This area is separated from other fire areas by concrete

barriers forming primary containment. Each group of two RCPs is separated from the other group by the reactor vessel and its concrete compartment. The walls of the reactor compartment are four feet thick concrete.

The RCP Motors have an upper oil reservoir for the thrust bearing containing 175 gallons of oil, and a lower bearing oil reservoir containing 15 gallons of oil. Both reservoirs are vented to the containment atmosphere to ensure that they would not be overpressurized during oil addition operations. The upper and lower oil reservoirs have oil fill lines at the motors which are contained by the RCP motor lube oil collection system. In 1985, ROALs were added to the original RCP oil fill lines to eliminate the need to shutdown the reactor, and to reduce personnel radiation and heat stress exposure during periodic RCP oil additions. The RCP lube oil collection system provides collection coverage for the original oil fill lines and the ROAL connection at the RCP motor. High and low oil level control room annunciators, and digital local level indications are provided for both upper and lower lube oil reservoirs.

The ROALs are constructed of 1/2" stainless steel tubing with 3000 psi pressure-rated swagelok unions. The ROALs transition to 1/2" stainless steel flexible metal hose (3000 psi rating) with compression type fittings at the D-Ring penetrations and attachment to each RCP motor reservoir. Connections to the original RCP lube oil fill line are above the maximum oil level of the upper and lower reservoirs. The operating pressure of the ROALs is 30 psig or less.

Inside the RCP D-Ring, the ROALs travel over or along a main steam line, steam generator insulation, and RCP casing before attaching to the original oil fill lines. The main steam line and the steam generator are

insulated with stainless steel encapsulated mineral wool. The RCP casing insulation is a non-absorbing mirror-type insulation. Outside the secondary shield wall, the ROALs do not travel over any hot main pipes or steam lines.

A portable oil metering pump skid, two portable tanks, and associated high pressure flexible hoses transport oil to containment during oil transfer operations. Connection of the pump discharges to the permanently mounted ROALs is via high pressure flexible hose with quick disconnect fittings. Each metering pump is provided with a relief valve located adjacent to the pump discharge and arranged to ensure that any oil discharge from the relief valve is captured and contained in a portable tank (suction supply). The oil supply tanks for each of the oil metering pumps meet the requirements of CR3's Administrative Instructions for the use of flammable or combustible liquids inside plant areas.

To minimize the potential for an oil fire due to a leak from the ROALs, the licensee proposes to implement several precautionary procedural actions during and following oil additions. They include requirements for monitoring oil transfers, communications between the control room and local operations personnel, walkdown and inspection of the ROALs and the areas around the oil pumping manifolds, and containment closeout inspection following refueling outages to assure the integrity of the ROALs.

## IV.

## EVALUATION

The Commission has completed its evaluation of the licensee's application.

The reactor lube oil collection system is required to prevent a major fire from occurring inside the reactor containment as a result of a lube oil leak from the RCPs. The ROALs are a low pressure system. The 3000 psi minimum design pressure of the ROALs is significantly higher than the 30 psig line operating pressures. All piping components associated with the suction and discharge of the portable oil transfer pump skid are appropriately rated for the service conditions. The hose connections are flexible hoses and therefore, are not subjected to mechanical vibration and thermal stresses.

Oil leakage from the ROALs is not expected to occur during oil transfer operations. The ROALs are used only periodically and operated using controlled procedures and processes. The controlled oil addition process includes determining the amount of oil to be added, performing a walk down before oil addition to check for leakage, and local and control room monitoring of the oil addition process. Following the addition of the proper amount of oil, the ROAL is drained either by gravity or by reversing the pump suction and discharge connections and pumping down the line. The upper and lower reservoirs contain only limited quantities of oil, 175 and 10 gallons, respectively. Based on the maximum oil addition allowed by procedures, the maximum potential oil spill will be only 12 gallons.

During power operation, damage to the ROALs would not occur because the reactor building access and work activities are limited during this time. Further, following refueling outages, containment close-out



procedures require visual inspections to assure the integrity of the ROALs.

Inside the D-ring, the ROALs travel over or along hot components that are insulated with a non-absorbing material or encased mineral wool. The surface temperatures of the insulation are below the ignition temperature of the oil, such that the insulation would not be a potential ignition source. The construction of this insulation makes it less likely for potential leaking oil to soak the encased mineral wool. Any potential oil leak in this area would be reasonably expected to travel down the insulation to the floor. Further, there are spot-type heat detectors located in this general area which can provide early warning to the control room in the event of a fire.

Outside the secondary shield wall, the ROALs do not travel over any hot main coolant pipes or steam lines and any potential leak in this area would pool on the floor and have no opportunity for ignition.

The ROALs are routed through two fire areas in the reactor building (RB), elevations 95 and 119 feet, designated as RB-95-300 and RB-119-302. The licensee has administrative controls that are designed to control the type, amount, use and location of combustibles. Proper control of combustibles minimizes the possibility of starting, spreading, or contributing to a fire. The probability for a fire hazard in this area is minimal because of separation of redundant components, the surrounding concrete structure, minimal or no intervening combustibles in the area, high ROAL design pressure and low operating pressure, and the short duration and infrequency of oil addition operations. However, the licensee has evaluated a worst case lube oil fire for these fire areas that contain ROALs and concluded that it is bounded by the CR3's existing Fire Hazards Analysis and Appendix R fire study.

In 1985, when the ROALs were originally installed, they were functionally leak tested with no visible leakage detected. During the last 12 years of performance there has been no indication of any leakage from the ROALs.

Fire detection and manual fire suppression equipment is available in the vicinity of the lube oil fill lines. In the event of a fire, it is expected that a detector will alarm while the fire is in its incipient stages. Operators would then take appropriate action to mitigate the consequences of the fire. This provides further assurance that a worst-case postulated fire would not damage safe shutdown equipment.

Based on the design features of the ROALs and associated lube oil collection systems, and the licensee's proposed compensatory actions, there is reasonable assurance that the RCP lube oil system will not lead to a major fire hazard. In addition, based on the present level of fire protection provided for the RCPs, if a fire were to occur in the area, there is reasonable assurance that the fire will be detected and mitigated. Therefore, the staff finds the ROALs without an oil collection system acceptable.

The underlying purpose of 10 CFR Part 50, Appendix R, Section III.O, is to ensure that lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems would be collected and not become a fire hazard such that "the capability to achieve and maintain safe shutdown conditions during and after any postulated fire in the plant" will be ensured. On the basis of its review and evaluation of the licensee's exemption request, the staff concludes that the addition of an oil collection system for the ROALs is not necessary to achieve the underlying purpose of the rule. Therefore,

an exemption from the requirement for providing a lube oil collection system for the RCP Motor ROALs is acceptable.

## V.

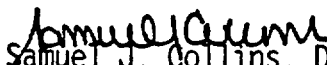
For the foregoing reasons, the NRC staff has concluded that pursuant to 10 CFR 50.12(a) an exemption permitting the licensee's proposed use of ROALs without an oil collection system is authorized by law, will not present an undue risk to public health and safety and is consistent with the common defense 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 Part 50, Appendix R, Section III.0, is not necessary in order to achieve the underlying purpose of this regulation.

Accordingly, the Commission hereby grants an exemption from the technical requirements of 10 CFR Part 50, Appendix R, Section III.0 to the extent that the ROALs need not be provided with an oil collection system.

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 59752).

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 19th day of November 1997

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V.

For the foregoing reasons, the NRC staff has concluded that pursuant to 10 CFR 50.12(a) an exemption permitting the licensee's proposed use of ROALs without an oil collection system 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 Part 50, Appendix R, Section III.0, is not necessary in order to achieve the underlying purpose of this regulation.

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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 **19th** day of **November** 1997

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