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Docket No. 50-302

Mr. Walter S. Wilgus
Vice President, Nuclear Operations
Florida Power Corporation
ATTN: Manager, Nuclear Licensing
& Fuel Management
Post Office Box 14042, M.A.C. H-2
St. Petersburg, Florida 33733

Dear Mr. Wilgus:

SUBJECT: INTERIM EXEMPTION FROM REACTOR VESSEL HEAD VENT REQUIREMENT OF 10 CFR 50.44 (c)(3)(iii)

By letter dated October 12, 1982, you requested an exemption to the 10 CFR 50.44(c)(3)(iii) requirement to install a vent on the Crystal River, Unit 3, reactor vessel head on the basis that this vent was unnecessary in light of other methods available to vent noncondensible gases from the vessel head area. Subsequent correspondence between the NRC staff and Florida Power Corporation established that such an exemption, if granted, would be interim in nature pending availability of actual integral system test data. The Commission has granted an interim exemption from this requirement as described in the enclosed Exemption.

A copy of the Exemption is being filed with the Office of the Federal Register for publication.

Sincerely,

ORIGINAL SIGNED BY

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Enclosure:
Exemption

cc w/enclosure:
See next page

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

July 21, 1983

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Docket No. 50-302

Docketing and Service Section
Office of the Secretary of the Commission

SUBJECT: CRYSTAL RIVER UNIT 3

Two signed originals of the Federal Register Notice identified below are enclosed for your transmittal to the Office of the Federal Register for publication. Additional conformed copies (6) of the Notice are enclosed for your use.

☐ Notice of Receipt of Application for Construction Permit(s) and Operating License(s).

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☐ Notice of Availability of Safety Evaluation Report.

☐ Notice of Issuance of Construction Permit(s).

☐ Notice of Issuance of Facility Operating License(s) or Amendment(s).

☒ Other: Interim Exemption from Reactor Vessel Head Vent Requirement of 10 CFR 50.44(c)(3)(iii).

Division of Licensing, ORB#4
Office of Nuclear Reactor Regulation

Enclosure:
As Stated

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NRC FORM 102 (1-76)

cc w/enclosure(s):
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Attorney General
Department of Legal Affairs
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Tallahassee, Florida 32304

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission, Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

EXEMPTION

I.

The Florida Power Corporation (the licensee) and eleven other co-owners hold Facility Operating License No. DPR-72, which authorizes the licensee to operate the Crystal River Unit No. 3 Nuclear Generating Plant (the facility) at steady-state power levels not in excess of 2544 megawatts thermal. This license provides, among other things, that it is subject to all rules, regulations and Orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect. The facility is a pressurized water reactor (PWR) located at the licensee's site in Citrus County, Florida.

II.

On December 2, 1981, the Commission published a revised Section 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors (46 FR 58484). Section 10 CFR 50.44(c)(3)(iii) of the regulation requires:

> "To provide improved operational capability to maintain adequate core cooling following an accident, by the end of the first scheduled outage beginning after July 1, 1982, and of sufficient duration to permit required modifications, each

light-water nuclear power reactor shall be provided with high point vents for the reactor coolant system, for the reactor vessel head, and for other systems required to maintain adequate core cooling if the accumulation of noncondensible gases would cause the loss of function of these systems."

The high point vent for the reactor vessel is the subject of this exemption.

By letter dated October 12, 1982, the licensee requested an exemption from the requirement of 10 CFR 50.44 for a reactor vessel head vent. The licensee, by letter dated January 11, 1980, committed to install in the facility high point vents at the top of the hot leg U-bends and at the top of the pressurizer. The installation of these vents will be completed prior to startup from the current refueling outage scheduled for July 1983. The licensee's exemption request stated that installing an additional vent in the reactor vessel head would not be necessary to prevent the loss of natural circulation.

III.

We have reviewed the licensee's exemption request and the bases for that request. Based on the information provided, we cannot conclude that noncondensible gases that evolve in the primary system can be safely vented by the hot leg high point vents alone. The primary reason for this conclusion is the lack of integral system test data which would demonstrate the feasibility of this approach.

The facility is expected to have the capability of venting noncondensible gas through the hot leg vents before natural circulation could be lost. However, if gas were trapped in the head, the procedure by which the gas could be vented through the hot leg vents by the operator during any required depressurization could be difficult. It is our understanding that the head venting capability via the hot leg vents has not been analyzed with a computer code capable of treating noncondensible gases in contact with steam-water mixtures, nor has any acceptable analysis been verified against integral systems data applicable to the Babcock and Wilcox (B&W) primary system configuration. As such, we do not have sufficient assurance from the licensee that venting noncondensible gases in the reactor vessel head via the hot leg high point vents can be safely and successfully accomplished. The ability of the operator to safely accomplish head venting via the hot legs has not been demonstrated, either with a simulator, a test facility, or a verified analysis code. The consequences of excessive depressurization and resultant natural circulation interruption during the venting process have not been examined. The staff believes that the ability of the operator to safely and successfully vent nonconsensible gas trapped in the vessel head with hot leg vents and in the absence of vessel head vents should be demonstrated by either (1) committing to conduct experiments in an appropriate integral system test facility to verify analysis methods and venting procedures, or (2) demonstrating with a simulator the operators' ability to safely and successfully perform head venting via the hot legs. The simulator must be shown to be capable of properly simulating the

phenomena of interest also by verification against appropriate integral system test data. Such test data could be obtained as part of the test program required to verify small break Loss of Coolant Accident methodology in Item II.K.3.30 of NUREG-0737.

By letter dated April 29, 1983, the licensee committed to participate in the B&W Owners Group Integral System Test program to demonstrate the efficacy of their proposed method of noncondensible gas removal from the reactor vessel head. The licensee has also agreed to submit their evaluation of the test results to verify analytical methods and operating procedures by April 1987. The licensee further committed to have the hot leg vents installed and declared operable, have procedures in place and operators trained for using these vents to vent noncondensible gases trapped in the reactor head prior to startup from the current refueling outage (expected in mid-July 1983).

Our present judgment is that the sequence of events necessary to lead to a degraded core condition which might involve the need to remove noncondensible gas from the vessel head region is of sufficient low probability that it is unlikely to occur during the interim period needed to obtain the necessary experimental data. Therefore, an interim exemption until the test results are received and reviewed should be granted.

IV.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, an exemption is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest.

The requested exemption from the requirements of 10 CFR 50.44(c)(3)(iii) pertaining to the installation of a reactor vessel head vent is hereby granted, modified and conditioned as follows:

The date July 1, 1982, from which the installation schedule for the reactor vessel head vent is established, is extended to December 31, 1985, which means that the head vents must be installed by the end of the first scheduled outage of sufficient duration after that date to permit the required modification. This exemption is based upon the Commission's expectation that sufficient actual test data will be available by mid-1985 to permit the licensee to make a decision and plan accordingly even though the Integral System Test Report may not have been issued in final form. The licensee shall conduct or participate in the B&W Owners Group Integral Test System Test Program to demonstrate the efficacy of their proposed method for noncondensible gas removal from the reactor vessel head and submit their evaluation of the test results to the NRC. It is recognized by the Commission that this testing is expected to confirm that the hot leg high point vents are sufficient to remove any noncondensible gases trapped in the reactor vessel head and that a head vent is not necessary for this purpose.

Prior to startup from the current refueling outage (startup scheduled for July 1983), the hot leg vents shall be operable and the licensee shall have procedures in place and operators trained for using the hot leg vents to vent noncondensible gases trapped in the reactor head.

The Commission has determined that the granting of this exemption will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4), an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Darrell G. Eisenhut, Director
Division of Licensing

Dated at Bethesda, Maryland,
this 21st day of July 1983.

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

July 21, 1983

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Division of Licensing, ORB#4
Office of Nuclear Reactor Regulation

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