

July 30, 2009

Mr. Dale E. Young, Vice President
Crystal River Nuclear Plant (NA1B)
ATTN: Supervisor, Licensing & Regulatory Programs
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Crystal River, FL 34428-6708

SUBJECT: AUDIT REPORT REGARDING THE LICENSE RENEWAL APPLICATION FOR
THE CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT (TAC NO.
ME0274)

Dear Mr. Young:

By letter dated December 16, 2008, Florida Power Corporation, submitted an application for review by the U.S. Nuclear Regulatory Commission (NRC) pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54) to renew the operating license for the Crystal River Unit 3 Nuclear Generating Plant (CR-3). On May 18, 2009, the NRC completed an audit of the CR-3 fluence calculations summarized in the license renewal application. The audit report is enclosed.

If you have any questions, please contact me at 301-415-3733 or by e-mail at robert.kuntz@nrc.gov.

/RA/

Robert F. Kuntz, Sr. Project Manager
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulations

Docket No. 50-302

Enclosure:
As stated

cc w/encl: See next page

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DATE	06/18/09	06/18/09	07/29/09	07/30/09

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Letter to D. Young from R. Kuntz, dated July 30, 2009

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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION - DIVISION OF LICENSE RENEWAL
AUDIT REPORT REGARDING THE LICENSE RENEWAL APPLICATION FOR
CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

Docket No: 50-302

License No: DPR-72

Licensee: Florida Power Corporation

Location of Audit: AREVA Offices
Bethesda, MD

Dates: May 18, 2009

NRC Staff: B. Parks, Reactor System Engineer, DSS

Licensee Staff: M. Heath, License Renewal Project Manager, Progress Energy
C. Mallner, Progress Energy
G. Elliot, AREVA
M. Miller, AREVA

Approved By: David J. Wrona, Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Introduction

By letter dated December 16, 2008, Florida Power Corporation, doing business as Progress Energy Florida, submitted a request for a renewed operating license for Crystal River Unit 3 Nuclear Generating Plant. Section 4.2 of the license renewal application discusses calculations performed to estimate the neutron fluence on the reactor vessel throughout the period of extended operation. The applicant stated that fluence calculations were performed using an NRC-approved methodology that is in adherence to the guidelines set forth in Regulatory Guide (RG) 1.190, "Calculational and Dosimetry Techniques for Determining Pressure Vessel Neutron Fluence."

The NRC staff audited the applicant's fluence calculations to verify that the calculations were performed as described.

ENCLOSURE

Regulatory Audit Bases

The NRC has promulgated regulations that govern the issuance of renewed operating licenses and renewed combined licenses for nuclear power plants licensed pursuant to Sections 103 or 104b of the Atomic Energy Act of 1954, as amended, and Title II of the Energy Reorganization Act of 1974. These regulations are contained in Part 54 of Title 10 of the *Code of Federal Regulations* (10 CFR 54). Specifically, 10 CFR 54.21(c) requires an evaluation of time-limited aging analyses (TLAAs) to be provided. 10 CFR 54.3 defines the TLAAs, and 10 CFR 54.21(c) further provides the requirements for the TLAAs.

Among the categories of applicable TLAAs, the applicant has identified reactor vessel neutron embrittlement as one such category. The neutron embrittlement analyses are supported by unit-specific fluence calculations, which are discussed in Section 4.2.1 of the license renewal application. The licensee states that the calculations are performed to be consistent with the guidance contained in RG 1.190.

RG 1.190 describes methods and assumptions acceptable to the NRC staff for determining the pressure vessel neutron fluence with respect to the General Design Criteria (GDC) contained in Appendix A to 10 CFR 50. By considering the applicable GDC, the NRC staff establishes that the neutron fluence calculation adequately supports the reactor vessel neutron embrittlement analyses, such that compliance with 10 CFR 54.21(c)(1) can be determined. In this case, the audit establishes that the licensee's neutron fluence calculations, which provide input to the neutron embrittlement-related, TLAAs, remain valid for the period of extended operation, thus demonstrating compliance with 10 CFR 54.21(c)(1)(i) as it pertains to the reactor vessel fluence calculation.

In consideration of the guidance set forth in RG 1.190, the following are applicable: GDC 14, "Reactor Coolant Pressure Boundary," GDC 30, "Quality of Reactor Coolant Pressure Boundary," and GDC 31, "Fracture Prevention of Reactor Coolant Pressure Boundary." GDC 14 requires the design, fabrication, erection, and testing of the reactor coolant pressure boundary so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture. GDC 30 requires, among other things, that components comprising the reactor coolant pressure boundary be designed, fabricated, erected, and tested to the highest quality standards practical. GDC 31, which pertains to the design of the reactor coolant pressure boundary, states that:

The reactor coolant pressure boundary shall be designed with sufficient margin to assure that when stressed under operating, maintenance, testing, and postulated accident conditions, (1) the boundary behaves in a nonbrittle manner and (2) the probability of rapidly propagating fracture is minimized. The design shall reflect consideration of service temperatures and other conditions of the boundary material under operating maintenance, testing and postulated accident conditions and the uncertainties in determining (1) material properties, (2) the effects of irradiation on material properties, (3) residual, steady state and transient stresses, and (4) size of flaws.

Regulatory Audit Scope

The scope of this audit activity was limited to an examination of the calculation notebook that documents the reactor vessel neutron fluence calculations performed to support the period of extended operation.

Summary of Regulatory Audit

The NRC staff reviewed AREVA proprietary document 86-9048187, "Crystal River 3 Analysis Report for License Renewal." The NRC staff did not identify any information contained in the document to suggest that the calculation was prepared inconsistent with the guidance in RG 1.190, or with the methodology described in BAW-2241(P), "Fluence Methodology and Uncertainties."

No open items or issues were identified during the audit.

The staff's review of Section 4.2, "Reactor Vessel Neutron Embrittlement," of the license renewal application will be documented in the staff's safety evaluation report.