



Crystal River Nuclear Plant  
Docket No. 50-302  
Operating License No. DPR-72

April 26, 2012  
3F0412-09

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

Subject: Crystal River Unit 3 – Response to Request for Additional Information to Support NRC Accident Dose Branch (AADB) Technical Review of the CR-3 Extended Power Uprate LAR (TAC No. ME6527)

- References:
1. CR-3 to NRC letter dated June 15, 2011, “Crystal River Unit 3 – License Amendment Request #309, Revision 0, Extended Power Uprate” (Accession No. ML112070659)
  2. NRC to CR-3 letter dated April 2, 2012, “Crystal River Unit 3 Nuclear Generating Plant – Request for Additional Information for Extended Power Uprate License Amendment Request (TAC No. ME6527)” (Accession No. ML120830028)

Dear Sir:

By letter dated June 15, 2011, Florida Power Corporation, doing business as Progress Energy Florida, Inc., requested a license amendment to increase the rated thermal power level of Crystal River Unit 3 (CR-3) from 2609 megawatts (MWt) to 3014 MWt (Reference 1). On April 2, 2012, the NRC provided a request for additional information (RAI) required to support the AADB technical review of the CR-3 Extended Power Uprate (EPU) License Amendment Request (LAR) (Reference 2).

The attachment, “Response to Request for Additional Information to Support NRC Accident Dose Branch Technical Review of the CR-3 EPU LAR,” provides the formal response to the RAI needed to support the AADB technical review of the CR-3 EPU LAR.

This correspondence contains no new regulatory commitments.

If you have any questions regarding this submittal, please contact Mr. Dan Westcott, Superintendent, Licensing and Regulatory Programs at (352) 563-4796.

Sincerely,



Jon A. Franke  
Vice President  
Crystal River Nuclear Plant

JAF/krw

Attachment: Response to Request for Additional Information to Support NRC Accident Dose Branch Technical Review of the CR-3 EPU LAR

xc: NRR Project Manager  
Regional Administrator, Region II  
Senior Resident Inspector  
State Contact

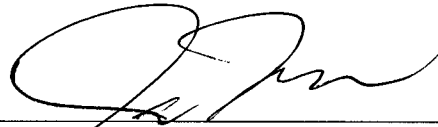
Progress Energy Florida, Inc.  
Crystal River Nuclear Plant  
15760 W. Powerline Street  
Crystal River, FL 34428

A001  
NRR

**STATE OF FLORIDA**

**COUNTY OF CITRUS**

Jon A. Franke states that he is the Vice President, Crystal River Nuclear Plant for Florida Power Corporation, doing business as Progress Energy Florida, Inc.; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.



Jon A. Franke  
Vice President  
Crystal River Nuclear Plant

The foregoing document was acknowledged before me this 26 day of April, 2012, by Jon A. Franke.



Signature of Notary Public  
State of Florida



(Print, type, or stamp Commissioned  
Name of Notary Public)

Personally Known  -OR- Produced Identification

**FLORIDA POWER CORPORATION**

**CRYSTAL RIVER UNIT 3**

**DOCKET NUMBER 50-302 /LICENSE NUMBER DPR-72**

**ATTACHMENT**

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION  
TO SUPPORT NRC ACCIDENT DOSE BRANCH TECHNICAL  
REVIEW OF THE CR-3 EPU LAR**

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION TO  
SUPPORT NRC ACCIDENT DOSE BRANCH TECHNICAL REVIEW OF  
THE CR-3 EPU LAR**

By letter dated June 15, 2011, Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc., requested a license amendment to increase the rated thermal power level of Crystal River Unit 3 (CR-3) from 2609 megawatts (MWt) to 3014 MWt. On April 2, 2012, the NRC provided a request for additional information (RAI) required to support the Accident Dose Branch (AADB) technical review of the CR-3 Extended Power Uprate (EPU) License Amendment Request (LAR). For tracking purposes, each item related to this RAI is uniquely identified as AADB X-Y, with X indicating the RAI set and Y indicating the sequential item number.

**AADB Requests for Additional Information**

**1. (AADB 1-1)**

In supplemental letter dated June 14, 2001 (ADAMS Accession No. ML011700661), for CR-3 alternative source term submittal, page 4 in Appendix B, the NRC was provided the radiological dose results for the CR-3 steam generator tube rupture (SGTR) design basis accident (DBA) using standard review plan (SRP) assumptions. Please provide the SGTR DBA dose results using SRP assumptions to demonstrate that CR-3 will continue to be in compliance with the limits of Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.67 with the proposed power uprate.

***Response:***

A radiological analysis of a SGTR accident from EPU conditions was performed consistent with the criteria of Section 15.0.1, "Radiological Consequence Analyses Using Alternative Source Terms," of the SRP. A summary of the associated SGTR thermal-hydraulic analysis was provided in a letter to the NRC Staff dated October 11, 2011 (Reference 1), and includes analysis input assumptions, methods, and thermal-hydraulic results. As noted in the October 11, 2012 letter (Reference 1), FPC continues to consider the existing CR-3 SGTR analysis, which assumes offsite power is available and no single failure, as the CR-3 current licensing and design basis. The total effective dose equivalent (TEDE) results following a SGTR accident at EPU conditions considering the SRP criteria are:

<b>Dose Receptor</b>	<b>TEDE Results (rem)</b>	<b>TEDE Limit (rem)</b>	<b>Percent of Regulatory Limit (%)</b>
<b>Concurrent Iodine Spike Initially at 0.25 µCi/gm Dose Equivalent Iodine-131</b>			
Exclusion Area Boundary	2.23	2.5	89
Low Population Zone	0.25	2.5	10
Main Control Room	0.45	5.0	9.0
<b>Pre-accident Iodine Spike at 15 µCi/gm Dose Equivalent Iodine-131</b>			
Exclusion Area Boundary	2.32	25	9.3
Low Population Zone	0.26	25	1.0

<b>Dose Receptor</b>	<b>TEDE Results (rem)</b>	<b>TEDE Limit (rem)</b>	<b>Percent of Regulatory Limit (%)</b>
Main Control Room	0.51	5.0	10

As indicated, CR-3 continues to meet the acceptance criteria of 10 CFR 50.67(b)(2) following a SGTR accident at EPU conditions.

## **2. (AADB 1-2)**

In Table 2.9.2-18, in Attachment 5 of the June 15, 2011, original submittal, item 13 states that the time to isolate letdown break will be decreasing from 19.5 minutes to 478 seconds (approximately 8 minutes). Please provide additional information for the basis of the isolation time decrease and also discuss whether this timeframe continues to assume manual actions. Also, please provide the total primary side mass release over the 478 seconds time period.

### ***Response:***

As indicated in Section 14.2.2.6, "Makeup System Letdown Line Failure Accident," of the CR-3 Final Safety Analysis Report, the letdown line rupture (LLR) accident analysis assumes operators manually isolate the letdown line 10 minutes following the Reactor Coolant System (RCS) hot leg reaching saturation conditions; 19.5 minutes (1170 seconds). The updated LLR accident analysis considering EPU conditions removes unnecessary conservatism by crediting the existing automatic letdown isolation on an RCS low pressure condition resulting in event termination 60 seconds following receipt of the Engineered Safeguards Actuation System RCS low pressure signal for a total event duration of 478 seconds (approximately 8 minutes). The letdown line break flow of 116.4 lbm/sec is assumed for the duration of the event and is based on a maximum break flow. The total calculated RCS mass release following an LLR accident at EPU conditions is 5.56 E4 pounds.

### **Reference**

1. FPC to NRC letter dated October 11, 2011, "Crystal River Unit 3 – Response to Request for Additional Information to Support NRC Reactor Systems Branch Acceptance Review of the CR-3 Extended Power Uprate LAR (TAC No. ME6527)." (Accession No. ML11286A092)