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10 CFR 50.54(f)

Serial: PE&RAS-05-008  
March 4, 2005

United States Nuclear Regulatory Commission  
ATTENTION: Document Control Desk  
Washington, DC 20555-0001

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1  
DOCKET NO. 50-400 / LICENSE NO. NPF-63

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261 / LICENSE NO. DPR-23

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT  
DOCKET NO. 50-302 / LICENSE NO. DPR-72

**RESPONSE TO NRC GENERIC LETTER 2004-02, "POTENTIAL IMPACT OF DEBRIS  
BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS  
ACCIDENTS AT PRESSURIZED-WATER REACTORS"**

REFERENCE: Letter from Suzanne C. Black, Director, Division of Safety Systems Analysis, Office of Nuclear Reactor Regulation, "Pressurized Water Reactor Containment Sump Evaluation Methodology," dated December 6, 2004.

Ladies and Gentlemen:

On September 13, 2004, the NRC issued Generic Letter 2004-02, "Potential Impact Of Debris Blockage On Emergency Recirculation During Design Basis Accidents At Pressurized-Water Reactors." The generic letter requested licensees to submit information regarding their planned actions and schedule to complete a mechanistic evaluation of the potential for the adverse effects of post-accident debris blockage and operation with debris-laden fluids to impede or prevent the recirculation functions of the Emergency Core Cooling System (ECCS) and Containment Spray System (CSS) following all postulated accidents for which the recirculation of these systems is required. This information was requested to be submitted within ninety (90) days of the issuance of the safety evaluation referenced above.

In accordance with the Code of Federal Regulations, Title 10, Part 50.54(f), Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc. (PEC), and Florida Power Corporation, now doing business as Progress Energy Florida, Inc. (PEF), are providing the requested information for the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2; the Shearon Harris Nuclear Power Plant (SHNPP), Unit No. 1; and the Crystal River Unit No. 3 Nuclear Generating Plant (CR3) in Enclosure 1.

No new Regulatory Commitment is contained in this submittal.

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Please refer any questions regarding this submittal to Mr. Tony Groblewski at (919) 546-4579.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on MARCH 4, 2005  
(date)

Sincerely,



C. S. Hinnant  
Senior Vice President and  
Chief Nuclear Officer

KMH  
Enclosure

c: U.S. NRC Region II  
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C. P. Patel, Project Manager SHNPP and HBRSEP, NRR (Electronic Copy Only)  
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CR3 Resident Inspector  
SHNPP Resident Inspector  
HBRSEP Resident Inspector

Regarding the Emergency Core Cooling System (ECCS) and Containment Spray System (CSS), Generic Letter 2004-02 states:

All addressees are requested to provide the following information:

1. Within 90 days of the date of the safety evaluation report providing the guidance for performing the requested evaluation, addressees are requested to provide information regarding their planned actions and schedule to complete the requested evaluation. The information should include the following:
  - (a) A description of the methodology that is used or will be used to analyze the susceptibility of the ECCS and CSS recirculation functions for your reactor to the adverse effects identified in this generic letter of post-accident debris blockage and operation with debris-laden fluids identified in this generic letter. Provide the completion date of the analysis that will be performed.
  - (b) A statement of whether you plan to perform a containment walkdown surveillance in support of the analysis of the susceptibility of the ECCS and CSS recirculation functions to the adverse effects of debris blockage identified in this generic letter. Provide justification if no containment walkdown surveillance will be performed. If a containment walkdown surveillance will be performed, state the planned methodology to be used and the planned completion date.

The following responses to Generic Letter 2004-02 are being submitted to the NRC by the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2; the Shearon Harris Nuclear Power Plant (SHNPP), Unit No. 1; and the Crystal River Unit No. 3 Nuclear Generating Plant (CR3).

**Response to Request 1(a)**

Susceptibility of the ECCS and CSS recirculation functions to the adverse effects of post-accident debris blockage and operation with debris-laden fluids is currently being analyzed by methods intended to conform to NEI Guidance Report 04-07, "Pressurized Water Reactor Sump Performance Evaluation Methodology," Volume 1 - "Pressurized Water Reactor Sump Performance Evaluation Methodology," and Volume 2 - "Safety Evaluation by the Office of NRR Related to NRC Generic Letter 2004-02, Revision 0, December 6, 2004" (referred to as the "NRC methodology" in the balance of this letter). The debris transport portion of the baseline methodology will be refined by computational fluid dynamics modeling, if necessary to decrease predicted debris transport. Based on the analysis work completed to date, the following exceptions to the NRC methodology have been identified:

1. The Zone of Influence (ZOI) for qualified epoxy coatings has been established as a sphere with a radius of four times the pipe break diameter. This radius is less than the radius of ten pipe break diameters recommended in Section 3.4.2.1 of the NRC methodology. However, planned industry testing is expected to support the four diameter ZOI. The schedule date for addressing this exception is September 1, 2005.
2. Unqualified epoxy coatings outside the ZOI are assumed to fail as chips, with a characteristic size dependent on coating thickness. Section 3.4.3.6 of the NRC Methodology recommends that unqualified epoxy coatings outside the ZOI fail as particulates with a diameter of 10 microns. However, the 10 micron size is associated with erosion of coatings due to high pressure jet impingement inside the ZOI. Coatings outside the ZOI are not exposed to jet impingement, and therefore the predominant failure mechanism is not erosion.
3. CR3 has two quality levels of qualified epoxy coatings. Service Level I coatings are defined as coatings applied to areas within containment where failure in a post-LOCA environment could have a detrimental effect on plant safety. These areas are defined as those where sump pool fluid velocity and turbulence that could be experienced during post-LOCA recovery are adequate to transport failed coatings to the sump and contribute to blockage of the sump strainer (reference Florida Power Corporation to NRC letter 3F1198-02, dated November 6, 1998, Response to Generic letter 98-04, "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System after a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment").

3. (continued)

Service Level II coatings are defined as coatings applied to areas outside the Service Level I areas, where transport of failed coatings to the sump during post-LOCA recirculation is unlikely. Service Level II coating products are Design Basis Accident (DBA) qualified and applied with the same work processes and documentation controls as Service Level I coatings, with an exception that verification and inspection activities may be performed by a qualified coatings verifier instead of a Quality Control Inspector. CR3 treats both Service Levels as qualified coatings for the purpose of post-LOCA debris generation, transport, and sump strainer impact considerations.

Service Level I and II coatings outside the ZOI that are degraded are assumed to fail as chips. The transport of failed coating chips is a function of location within the sump pool, pool turbulence, and pool velocity.

Other exceptions to the NRC methodology may be identified as analyses are further developed.

The current schedules for completing analyses to address susceptibility of ECCS and CSS recirculation functions to the effects of post-accident debris blockage and operation with debris-laden fluids, except for downstream effects, are as follows:

The schedule date for completion of these analyses at CR3; SHNPP, Unit No. 1; and HBRSEP, Unit No. 2 is September 1, 2005.

The schedule date for identifying downstream components potentially susceptible to blockage or wear due to operation with debris-laden fluid is September 1, 2005 for CR3; SHNPP, Unit No. 1; and HBRSEP, Unit No. 2. At CR3, the schedule date for analyzing the components susceptible to the downstream effects of post-accident debris blockage and operation with debris-laden fluids is September 1, 2005. For SHNPP, Unit No. 1 and HBRSEP, Unit. No. 2 the schedule date for analyzing the components susceptible to the downstream effects of post-accident debris blockage and operation with debris-laden fluids is November 7, 2006.

Revisions to analyses after the scheduled completion dates reported above may be necessary to address issues that are still unresolved. For example, the method used to account for potential chemical effects may need to be adjusted based on conclusions from the ongoing integrated chemical effects testing.

These analyses contain assumptions about latent debris quantification and characterization. The schedule dates for confirming these assumptions is:

CR3	Completed September 21, 2004
HBRSEP, Unit No. 2	Complete by December 1, 2005
SHNPP, Unit No. 1	Complete by June 30, 2006

**Response to Request 1(b)**

Containment walkdown surveillances have been performed to identify potential accident debris sources. These walkdown surveillances were performed in general agreement with the guidance provided in NEI 02-01, Revision 1, "Condition Assessment Guidelines: Debris Sources Inside PWR Containments, September 2002." These walkdowns were completed as follows:

CR3	Completed during RFO-13 (Fall 2003)
SHNPP, Unit No. 1	Completed during RFO-11 (Spring 2003)
HBRSEP, Unit No. 2	Initiated during RFO-21 (Fall 2002); Completed during RFO-22 (Spring 2004)