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Rick J. King
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November 4, 1996

U. S. Nuclear Regulatory Commission
Mail Station P1-37
Washington, DC 20555

Attention: Document Control Desk

Subject: River Bend Station
Docket No. 50-458
License No. NPF-47
Response to NRC Bulletin 96-03,
"Potential Plugging of ECCS Strainers
By Debris in Boiling Water Reactors"

File Nos.: G9.5, G9.33.1

RBF1-96-0415
RBG-43971

Gentlemen:

This submittal provides the River Bend Station (RBS) response to NRC Bulletin (NRCB) 96-03, "Potential Plugging of ECCS Strainers By Debris in Boiling Water Reactors." On May 6, 1996, the Nuclear Regulatory Commission issued the subject bulletin regarding an issue that could potentially degrade performance of the Emergency Core Cooling Systems in boiling water reactors. The bulletin required, within 180 days, a report indicating whether licensees intended to comply with the requested actions, including a description of planned actions, the schedule for implementation and proposed technical specifications (if appropriate). By this letter, River Bend Station (RBS) is providing the requested information in the attachment.

RBS has investigated a number of options for responding to the bulletin. In addition, Entergy and Cleveland Electric Illuminating Company (CEI) are working cooperatively to resolve the issues raised by NRCB 96-03 for the Perry Nuclear Power Plant, River Bend Station and Grand Gulf Nuclear Station. This cooperative effort included a detailed analysis of NRCB 96-03 options which ultimately resulted in selection of Option 1 - installation of a large capacity passive strainer design - as the preferred approach.

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As our design, analysis and testing proceeds, we would propose to meet with the NRC to share our results during mid December 1996. This information is being submitted under oath and affirmation in accordance with 10CFR50.54(f).

Should you have any questions or require additional information regarding this matter, please contact T. W. Gates at (504) 381-4866.

Sincerely,

RJK/mjr
attachment: Response to NRC Bulletin 96-03

cc: Mr. David L. Wigginton
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Department of Environmental Quality
Radiation Protection Division
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Attn: Administrator

BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-47

IN THE MATTER OF

ENTERGY GULF STATES, INC.

CAJUN ELECTRIC POWER COOPERATIVE AND

ENTERGY OPERATIONS, INC.

AFFIRMATION

I, Rick J. King, state that I am Director of Nuclear Safety and Regulatory Affairs of Entergy Operations, Inc., at River Bend Station; that on behalf of Entergy Operations, Inc., I am authorized by Entergy Operations, Inc. to sign and file with the Nuclear Regulatory Commission, this Response to NRC Bulletin 96-03, "Potential Plugging of ECCS Strainers By Debris in Boiling Water Reactors;" that I signed this request as Director- Nuclear Safety and Regulatory Affairs at River Bend Station of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information, and belief.

Rick J. King

STATE OF LOUISIANA
WEST FELICIANA PARISH

SUBSCRIBED AND SWORN TO before me, Notary Public, commissioned in the Parish of East Baton Rouge and qualified in and for the Parish and State above named, this 4th day of November 1995.

(SEAL)

Jane Russell
Notary Public

My Commission expires with life.

RESPONSE TO NRC BULLETIN 96-03, "POTENTIAL PLUGGING OF ECCS STRAINERS BY DEBRIS IN BOILING WATER REACTORS"

On May 6, 1996, the Nuclear Regulatory Commission (NRC) issued Bulletin 96-03, "Potential Plugging of Emergency Core Cooling Suction Strainers by Debris in Boiling Water Reactors." This bulletin requires boiling water reactor (BWR) licensees to take actions that will ensure the emergency core cooling systems (ECCS) retain their capability to perform their safety functions following a loss of coolant accident (LOCA).

Background

The efforts of River Bend Station (RBS) and the common effort with CEI and Grand Gulf Nuclear Station have resulted in the selection of Option 1 - installation of a large capacity passive strainer design - as the preferred approach to resolve the concerns expressed in NRCB 96-03. As discussed below, significant work remains to translate our intentions into a workable solution. It is important to note that the specific strainer design currently under consideration may not prove to be the optimum solution for this plant. Our ongoing analysis may lead to the selection of an alternate passive strainer design.

Design

The primary conceptual strainer design identified in the common Entergy-CEI approach employs a floor mounted passive ring strainer that circles the suppression pool. The large passive strainer is designed to achieve a very low approach velocity at the surface of the strainer, sufficient to minimize compaction of debris at the strainer surface, thereby allowing greater flow through the debris and the strainer.

Other designs under consideration are also large passive strainers which will replace those currently installed. These alternate designs, like the ring strainer, also achieve a low approach velocity at the surface of the strainer to minimize compaction of debris at the strainer surface.

The strainer designs are expected to be in accordance with Regulatory Guide 1.82, Revision 2, "Water Sources For Long-Term Recirculation Cooling Following A Loss-Of-Coolant Accident," as implemented using the BWROG Utility Resolution Guidance (URG) document. The use of the calculational methods provided in the URG is expected to be necessary to address the options identified in the RG and achieve an optimum solution. This guidance includes criteria and reference limits on a number of issues which may be required to successfully address the RG. Significant issues currently identified are the drywell debris sources, drywell debris transport and other debris sources.

License/Design Basis Change

Assuming the analytic and testing results are favorable, it may be necessary to change the licensing and design basis of the RBS facility to reflect the new strainer design. In addition, the NRC review of the URG may also identify other issues that may require a change to the licensing basis. RBS will evaluate the passive strainer design under 10 CFR 50.59. In the event that an unreviewed safety question is identified, NRC approval will be sought in accordance with 10 CFR 50.90.

One possible issue is the calculational methodology for determining appropriate combinations of seismic and hydrodynamic loads acting on the conceptual design as specified in GESSAR II. In order to correctly characterize the upward loads on the floor-mounted passive strainer, Entergy and CEI expect to apply acoustic theory - a methodology that has previously been used to analyze hydrodynamic loads produced in Mark II containments. Another issue is a change to the design basis peak suppression pool temperature to 185° F. This change is to increase the net positive suction head available for the ECCS pumps.

Technical Specifications

NRCB 96-03 suggests the addition of technical specification surveillance requirements for passive strainer designs and suppression pool cleanliness. Such requirements are not mandated for the current ECCS strainers, nor should they be considered for a new improved strainer design which is less susceptible to clogging than the existing strainers.[1] Strainer and suppression pool cleanliness should be, and will be, programmatically controlled similar to other preventive maintenance practices and inservice inspection activities. The current practices at RBS are identified in the responses to NRC Bulletin 95-02.

The NRCB 96-03 position on technical specifications constitutes a new staff position and is not covered by the compliance backfit discussion in NRCB 96-03. The addition of technical specification requirements for passive strainers deserves further review under 10CFR50.109.[2]

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1 We are concerned that the NRC not return to the practice which prompted the need for improved technical specifications. As noted in the supplementary information associated with the Commission's final policy statement on improved technical specifications:

"...[S]ince 1969, there has been a trend towards including in Technical Specifications not only those requirements derived from the analyses and evaluation included in the safety analysis report but also essentially all other Commission requirements governing the operation of nuclear power reactors... This has contributed to the volume of Technical Specifications and to the several-fold increase, since 1969, in the number of license amendment applications... It has diverted both staff and licensee attention from the more important requirements in these documents to the extent that it has resulted in an adverse but unquantifiable impact on safety."

2 NRCB 96-03 is characterized as a compliance backfit with respect to 10CFR50.46. Since 10CFR50.46 is silent with respect to Technical Specifications, this position does not extend to requiring new Technical Specifications for passive strainers. We believe a separate application of 10CFR50.109 is necessary to address this question.

Testing

In addition to more generic testing performed through the BWR Owners Group, CEI and Entergy have initiated a testing program to validate that the conceptual design for a large passive strainer will perform as intended. Tests are being conducted in a ¼ scale mockup of a Mark III containment at the Factory Mutual Research Corporation test center. Testing will address a range of issues associated with strainer performance, including variations in ECCS flow rates and quantities of simulated post-LOCA debris and other fouling agents. The primary data collected will relate to strainer performance including differential pressure across the strainer, debris bed thickness on the strainer and suppression pool velocity.

The alternate designs under consideration at RBS are also being tested to ensure acceptable ECCS performance. This testing is being performed at the EPRI test facility and will include test conditions which can be applied to RBS.

Schedule

RBS is making a good faith effort to meet the implementation schedule requested by NRCB 96-03 -- i.e., by the end of the first refueling outage starting after January 1, 1997. Our efforts expect to achieve the following milestones:

November, 1996	Complete testing of strainer designs under consideration.
December, 1996	1. BWROG-NRC meeting concerning the state of the URG review. 2. Complete the initial 10CFR50.59 evaluation to identify significant licensing basis issues. 3. Complete analysis of testing data. 4. Meeting with NRC concerning the state of the RBS passive strainer design selection. 5. NRC complete review of the BWROG URG. 5. Complete final design selection. 6. Release strainer for detailed design and fabrication.
September, 1997	Begin strainer installation during the RBS seventh refueling outage.
October/November, 1997	Complete strainer installation and issue final response to NRC.

This schedule is optimistic and predicated upon several key factors. Failure to satisfy the following conditions may result in extending the RBS strainer installation schedule:

- Favorable completion of testing supporting compliance with Regulatory Guide 1.82, Revision 2.

- Favorable completion of analyses (e.g., test evaluations) supporting compliance with Regulatory Guide 1.82, Revision 2 and other applicable regulatory requirements (e.g., hydrodynamic load analysis).

- Completion of NRC review and approval of the BWROG URG.

- Determination that no unreviewed safety question is associated with implementing the strainer design.

Should we determine that an unreviewed safety question exists, RBS will promptly prepare and submit a license amendment request for NRC review and approval. At that point, further design and fabrication activity will be reevaluated depending on the nature of the USQ. If a USQ is found, the NRC will be promptly informed of the effects on the design and installation schedule and what efforts RBS is taking to resolve the issues. Once NRC approval of the USQ is obtained, the schedule will be revised accordingly.