

March 16, 2004

MEMORANDUM TO: Michael Tschiltz, Chief  
Probabilistic Safety Assessment Branch  
Division of Systems Safety and Analysis  
Office of Nuclear Reactor Regulation

FROM: Jack Rosenthal, Chief /RA/  
Safety Margins and Systems Analysis Branch  
Division of Systems Analysis and Regulatory Effectiveness  
Office of Nuclear Regulatory Research

SUBJECT: TECHNICAL ASSISTANCE RELATING TO A RIVER BEND  
CONTAINMENT SUBCOMPARTMENT LICENSE AMENDMENT

As part of our containment analysis activities, your staff requested technical assistance with the review of a River Bend license amendment request. This license amendment request is based on a proposed change of the method for performing subcompartment analysis by using the GOTHIC code. In the limiting subcompartment case (i.e., a RWCU 8 inch break in the filter/demineralizer room), there was a significant reduction in the break room pressure which required a more in-depth review of the GOTHIC code. RES performed this targeted review and draft assessments with preliminary findings were sent to your cognizant staff member, R. Lobel for review.

During the course of this review, we were informed that River Bend intends to withdraw the use of the GOTHIC code drop liquid conversion model which closes out this issue for RES since this model was the principal basis for the NRR request for RES review. However based on the unique characteristics of the River Bend mass and energy release profile and the small vent area exiting the filter/demineralizer room, it was shown that the relevant SRP guidance of 100% blowdown entrainment is not always conservative. Using the CONTAIN code with various parametric sensitivities, we found that the calculated River Bend filter/demineralizer room differential pressure exceeds the design limit during this postulated break, particularly because there is a protracted period of choked flow at the vent path of the room. The blowdown room vent area is an important design parameter because it is the passive means by which pressure build-up is mitigated. We compared filter/demineralizer rooms of other Mark III containments, e.g., Perry and Grand Gulf, and it was shown that these vent areas are greater than 30 times greater than River Bend, and thereby room pressurization is not a problem.

In a telecon on March 11, 2004 with the River Bend licensee, it was learned that concrete plugs are used to gain access to the filter/demineralizer room as compared to an open access doorway used by the other Mark III plants. This explains the limited vent area at River Bend. The licensee also stated that they had done a sensitivity study, and they have confirmed our higher calculated pressures. Furthermore, the licensee intends to use the most conservative approach using GOTHIC. Moreover, the licensee intends to demonstrate that the room is structurally capable to withstand the higher pressure response.

Attached is a technical evaluation of this activity and it will provide useful insight for future reviews. The core of the attached evaluation was performed by Jack Tills (our expert subcontractor) with A. Notafrancesco, RES providing technical guidance and oversight. Also, we are appreciative of comments provided by R. Lobel and they were incorporated; and as requested, this evaluation is placed in the public domain. Please contact Allen Notafrancesco (415-6499) for any further discussion on this matter.

Attachment: As stated

cc w/o att.:

S. Black, NRR

R. Dennig, NRR

E. Throm, NRR

R. Lobel, NRR

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