

July 7, 2005

MEMORANDUM TO: James E. Lyons, Director  
Division of Systems Safety and Analysis  
Office of Nuclear Reactor Regulation

FROM: Farouk Eltawila, Director */RA/*  
Division of Systems Analysis and Regulatory Effectiveness  
Office of Nuclear Regulatory Research

SUBJECT: TECHNICAL ASSISTANCE RELATED TO AUDITING VERMONT  
YANKEE CONTAINMENT ANALYSIS FOR EVALUATION OF NPSH

Pursuant to a request for technical assistance in performing computer calculations to support the review of the Vermont Yankee power uprate license amendment request, particularly, this request was to analyze the long-term containment response used for evaluating NPSH. Using the licensee's information from a letter dated August 12, 2004 and consultation with your cognizant staff member, R. Lobel, RES has performed NPSH audit calculations using the CONTAIN code. The following summarizes our effort.

Focusing on the key figure of merit, i.e., peak long-term suppression pool temperature, CONTAIN was used for modeling the Vermont Yankee Mark I design. Firstly, a two control volume model was constructed to represent the drywell and wetwell volumes. Due to the long execution times of this two-volume model and considering the possible need to perform code sensitivities (also recognizing that these were stable long-term transients which usually exhibit compensating factors), a consolidated one-volume model was constructed. Attached are the results of these calculations which are compared to the licensee's results. [Since we did not initially have all the heat exchanger characteristics to model a shell-tube design, a temperature drop option was used first and after we received more information to model the shell-tube heat exchanger, another CONTAIN one-volume case was performed.] All these code parameters/modeling variations made little difference and we show a good comparison with the licensee.

In summary, CONTAIN predicted results for Vermont Yankee are comparable to the licensee's calculations and the overall longterm transient response is consistent with other Mark I designs. And the input supplied by the licensee appeared reasonable.

J. Lyons

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We understand that this NPSH issue would likely be discussed in future public meetings on the licensee's power uprate request, thereby more code calculations may be needed. RES will accordingly be engaged. Please contact Allen Notafrancesco (415-6499) for any further discussion on this matter.

Attachment:

As stated

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