Docket No. 50-271

MAY 02 1989

Mr. R. W. Capstick
Licensing Engineer
Vermont Yankee Nuclear Power
Corporation
580 Main Street
Bolton, Massachusetts 01740-1398

Dear Mr. Capstick:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - FROSSTEY-2 FUEL PERFORMANCE CODE (TAC NO.68216)

Re: Vermont Yankee Nuclear Power Station

We are reviewing your use of the Frosstey Computer Code for LOCA analysis as described in your letter dated December 16, 1987. We find that we need additional information as described in the enclosed request for additional information to complete our review. We request that you provide a response to the enclosed request within 60 days of receipt of this letter.

The reporting and/or record keeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

/S/

Morton B. Fairtile, Project Manager
Project Directorate I-3
Division of Reactor Projects I/II

Enclosure:
As stated

cc w/enclosure:
See next page

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[VER.YANK.REQUEST ADD.INFO.]

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OFC	:PDI-3	:PDI-3	:DIR/PDI-3	:	:	:	:
NAME	:MRushbrook	:MFairtile:mw	:RWessman	:	:	:	:
DATE	:5/1/89	:5/2/89	:5/2/89	:	:	:	:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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Sincerely,

Morton B. Fairtile

Morton B. Fairtile, Project Manager
Project Directorate I-3
Division of Reactor Projects I/II

Enclosure:
As stated

cc w/enclosure:
See next page

Mr. R. W. Capstick
Vermont Yankee Nuclear Power Corporation

Vermont Yankee Nuclear Power Station

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Administrative Judge
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U.S. Nuclear Regulatory Commission
Washington, DC 20555

Adjudicatory File (2)
Atomic Safety and Licensing Board
Panel Docket
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

QUESTIONS FOR VERMONT YANKEE LOCA ANALYSIS METHOD: FROSSTEY FUEL PERFORMANCE CODE (FROSSTEY2)

1. Please provide examples of FROSSTEY2 licensing calculations for LOCA initialization, end-of-life rod pressures, fuel-to-cladding gap conductance, fuel centerline melt, and cladding strain. Also, provide sufficient input and output information to allow independent audit calculations with an NRC audit code. For example, the LOCA output should include predicted centerline and volume average temperatures of the peak node, cladding oxide thickness and rod average fission gas release versus rod average burnup; the internal rod pressure calculation should include predicted centerline temperatures of peak node, cladding oxide thickness, rod average fission gas release, and internal rod pressures versus rod average burnup. A discussion should also be provided along with each example licensing calculation describing how the input and code application methodology provide assurances that each of these analyses are conservative and bounding for a particular core reload. Please quantify these conservatisms where it is possible to do so.

2. What impact does the lower assumed fuel conductivity and subsequent increase in fuel relocation in FROSSTEY2 have on LOCA and other licensing analyses? If there is a decrease in calculated volume average temperature for LOCA (and thus lower peak cladding temperatures for LOCA), then 1) supporting data for this assumed decrease in fuel thermal conductivity needs to be presented, and 2) the uncertainties in this data accounted for in the licensing analyses. Therefore, the impact of the thermal conductivity decrease on licensing analyses needs to be addressed, and, where appropriate, uncertainties accounted for to assure that these licensing analyses are conservative and bounding.

3. Please provide the relationship used to correct the as-measured thermocouple data for decalibration.

4. Examination of the FROSSTEY2 predictions of fission gas release data in Figures B.5 and B.9 indicates that the code underpredicts fission gas release above measured percent release values of approximately 12%.

This underprediction is most noticeable on the transient (power ramped) fission gas release data where 27 of 29 data are underpredicted; however, the steady-state fission gas release data from pressurized rods is also underpredicted. This nonconservatism on fission gas release can effect rod pressures, gap conductances, and fuel temperatures when a fuel rod has a release value greater than 12%. Please discuss how this lack of conservatism will be addressed in the application of FROSSTEY2 licensing analyses in order to assure that these analyses are conservative and bounding. Also, provide the measured release values for the fission gas release data in Table B.6.