

May 7, 1990

Docket No. 50-029

Mr. George Papanic, Jr.
Senior Project Engineer - Licensing
Yankee Atomic Electric Company
580 Main Street
Bolton, Massachusetts 01740-1398

Dear Mr. Papanic:

SUBJECT: YANKEE ROWE REACTOR VESSEL INTEGRITY (TAC 71570)

As we discussed with Dr. Kadak on May 4, 1990, attached is a list of issues which we would like you to address at our May 9, 1990 meeting on reactor vessel integrity. We recognize that these issues have been transmitted to you with short notice prior to the scheduled meeting. If you find that you need additional time for preparation, please contact me and we will reschedule the meeting for the earliest practical date.

Sincerely,

Original signed by
Richard H. Wessman, Director
Project Directorate I-3
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosure:
Request for Information

cc w/enclosure:
See next page

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| NAME | : MRushbrook | : PSears:mw | : RWessman | : JRichardson | : | : |
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Mr. George Papanic, Jr.

Yankee Rowe

cc:

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ENCLOSURE

REQUEST FOR INFORMATION

- 1) Discuss installation of surveillance capsules in the reactor at accelerated (high flux) positions and at low flux positions.
- 2) Discuss removal of the shield tank or other plant structural changes necessary for UT inspection of the beltline.
- 3) Provide fabrication history (welding and heat treatment) and inspection (both preservice and inservice) results for beltline materials and for other vessel materials that were fabricated in the same manner as the beltline materials.
- 4) Discuss the fabrication history (cross-rolling and heat treatment) of beltline plates. Based on the fabrication history, what is the Charpy Upper Shelf Energy (USE) in the transverse direction for the beltline plates, unirradiated, in 1990 and in 2000?
- 5) Identify the heats numbers for the weld wire used to fabricate each beltline weld?

Are the heats of wire used to fabricate the Yankee Rowe reactor vessel beltline welds the same as the Belgium Reactor Unit 3 (BR-3) welds? Based on the heats of wire used, what are the amounts of copper, nickel and phosphorus in each beltline weld? What is the Charpy USE for each beltline weld, unirradiated, in 1990 and in 2000?

- 6) In NRL Report 6616, it is reported that the Yankee Rowe cold leg temperature was 495°F during cycle II, 500°F during cycle III and 505°F during cycle IV. In addition Yankee Rowe produced power during coastdown. At these reactor operating temperatures, the amount of neutron irradiation embrittlement could be greater than predicted by RG 1.99, Rev.2 and the PTS rule, 50.61.

What is the average cold leg temperature (excluding coastdown) during each core cycle?

Does Yankee Rowe still operate with coastdown periods where the cold leg temperature is less than 500°F? When did coastdown operation stop?

What is the accumulated neutron fluence during these coastdown periods?

- 7) Based on BR-3 data in a report by A. Fabry dated October 22, 1983, the increase in reference temperature and decrease in Charpy USE is greater at 500°F than at 550°F operating temperatures. Since RG 1.99, Rev. 2 is applicable to plants with nominal irradiation temperatures of 550°F and Yankee Rowe operates below 525°F what is the predicted reference temperature and the Charpy USE for the circumferential beltline weld in 1990 and 2000? Provide all data which supports these values.
- 8) Based on the Yankee Rowe surveillance data, the increase in reference temperature for the beltline plates could be greater than the values predicted following the tables in RG 1.99, Rev. 2. Based on its surveillance data, what is the predicted reference temperature for each plate in 1990 and 2000? If there is other data available that Yankee Rowe is relying upon to predict the reference temperature of each plate in the beltline, provide it. Based on this data, what is the reference temperature for each beltline plate in 1990 and 2000?
- 9) Section V.C. in Appendix G, 10 CFR 50 identifies three requirements which must be satisfied to continue operation of a reactor vessel when its Charpy USE falls below 50 ft-lb. Discuss how Yankee Rowe plans to satisfy each of these requirements for the weld metal and plates that are predicted to have Charpy USE less than 50 ft-lb.
- 10) Discuss the need for, benefit and feasibility of performing an anneal at 650°F or 850°F.