

July 26, 2001

MEMORANDUM TO: Richard P. Correia, Acting Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

FROM: Timothy G. Colburn, Senior Project Manager, Section 1 **/RAI/**  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION (RAI) FAXED TO THE  
LICENSEE RE: TMI-1 LICENSING ACTION REACTOR VESSEL HEAD  
REPAIR RELIEF REQUESTS (TAC NO. MB2323)

The technical review staff e-mailed the attached questions to me, which have been faxed to the licensee regarding the staff's review of the licensee's application dated July 2, 2001. These questions were discussed with the licensee on July 16, 2001, in order to determine whether the information had been previously placed on the docket. Questions 6, 7, and 8 under the heading "Other Questions" on RR-01-16 have been determined to be unnecessary and will not be responded to by the licensee. The licensee will respond to the remaining questions. The licensee has agreed with the staff's initial assessment of the proprietary information as documented in questions 1 and 2 under the heading "RR-01-15," and the second question under the heading "TMI QUESTIONS," and will modify its submittal accordingly. This memo documents the questions discussed with the licensee. The licensee's response will repeat the questions.

Docket No. 50-289

Attachment: RAI

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NAME	TColburn	MO'Brien	RCorreia
DATE	7/24/01	7/24/01	7/24/01

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Three Mile Island, Unit 1  
Requesting Clarification on RR-01-15 and RR-01-16

RR-01-15:

On page 2 of 2, the first line, the proprietary portion should stop at the period and not include the beginning of the next sentence.

On page 2 of 2, the last two lines of the third paragraph, the proprietary portion should not include the phrase "hardship ... RV head."

On page 2 of 2, the proposed alternative provision should include a statement on the inspections that will be performed on the area surrounding the repair.

Other Questions on RR-01-15

1. In Figure 1 or some other representation, show the material identification (stainless steel, carbon steel, Inconel 690 etc.), dimensions of the vessel wall thickness, and dimensions of the proposed repair weld.
2. Figure 1 shows that after boring out the CRDM, there is an exposed carbon steel (assumed material) surface. Will this surface be exposed during operation? If so, explain why it is acceptable to operate with an exposed carbon steel surface.
3. Using a cross section view of the weld, HAZ, and adjacent area, show the UT center beam trace for the different transducers. Identify the transducers, sizes, and frequencies. Provide a pictorial of the volume that each transducer will cover. Estimate the UT coverage for weld and HAZ. Estimate the volumetric coverage with respect to Code requirements. Expand the discussion on the difficulties preventing the Code-required, volumetric coverage.
4. Show the surfaces in Figure 1 that will be examined with PT after welding. Estimate the surface examined area coverage with respect to Code requirements. Expand on the discussion on the difficulties preventing Code-required surface coverage.

RR-01-16:

On page 4 of 4 first paragraph, the proposed alternative is identified as a hardship (10 CFR 50.55a(a)(3)(ii)). The justification supports an acceptable level of quality and safety (10 CFR 50.55a(a)(3)(i)). The staff will be reviewing the request according to 10 CFR 50.55a(a)(3)(i).

On page 4 of 4 second paragraph, in lieu of eliminating the 48-hour hold time, state the post weld hold time and temperature(s) that will be used. Estimate the cool down time to reach ambient temperature. Identify a maximum ambient temperature.

Other Questions on RR-01-16

1. Provide the supporting data for industry experience associated with the lower hydrogen cracking limit of 5ml of Hydrogen/100grams of weld material.

ATTACHMENT

2. The source of hydrogen in a weldment comes from shielding gases, flux, or surface contamination. Discuss the purity and flow rate and containment considerations of the shielding gas over the weld puddle and after solidification. Discuss any hydrogen measurements performed during the mock-up demonstration or procedure qualifications. Discuss surface cleanliness (moisture, cutting oils, any other contaminants) in the area of repair/preheat.
3. Discuss the as welded or post weld heat treatment microstructure of the weld and HAZ. The discussion should include the presence of martensite and hardness measurements, if any.
4. Discuss post weld heat treatment hold temperatures and times, cool down times to ambient temperature, and time before actually starting NDE examinations.
5. Discuss the effects, if any, that the composition of the base metal has on hydrogen cracking.
6. For this (or similar) base material and weld practice, discuss situations and conditions that resulted in hydrogen cracking.
7. Provide a discussion on hydrogen cracking (or the absence of it) in austenitic material (stainless steels and Inconel).
8. The staff is reviewing the submittal on its own merit for the specific application at Three Mile Island, Unit 1. The review is independent of Code Case N-432-1.

#### TMI QUESTIONS

This repair allows the carbon steel (i.e., low alloy steel) of the reactor pressure vessel (RPV) head to contact the boric acid water of the reactor coolant. How do you propose to prevent or evaluate the impact of boric acid corrosion of the RPV head material for the remaining life of the vessel?

Number "3" on page 2 of 3 of the document "Eliminate Monitoring of Interpass Temperature", is shown as proprietary. This statement should not be proprietary since the temper bead technique is not proprietary, nor is staggering or moving weld beads over.

There are some questions on the interpass temperature calculation that was submitted. Look at it carefully to make sure that all units and their equations and their variables are correct. If you round numbers, be sure to explain this clearly. Please have someone available to discuss this calculation who is knowledgeable with it.