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Document Control Desk
US Nuclear Regulatory Commission
Washington, DC 20555

Dear Sirs:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Reactor Pressure Vessel Integrity

We have received a letter from Burns & Roe (B&R) dated January 7, 1987, a copy of which you should have received, discussing the QAD - Study TMI-2 Under Vessel Dose Rates. We informally discussed this analysis with the B&R representative to the Technical Assistance and Advisory Group (TAAG) before the TAAG meeting at TMI-2 on January 13, 1987. Based on that discussion, B&R has revised its conclusions (January 16, 1987, B&R letter, attached). We are forwarding this information and associated technical documentation prepared by the TMI-2 Project to Babcock & Wilcox (B&W), the reactor-designer, for review and comment based upon their extensive previous analysis of the integrity of the lower head region. Earlier B&W evaluations of reactor vessel integrity concluded that the lower head had retained its integrity during and since the accident. B&W analysis of the thermal transient during the accident, which resulted in fuel slumping into the lower head and the potential for damage to the lower head, concluded that no loss of integrity had occurred. GPU Nuclear's preliminary evaluation of the B&R calculations indicate they do not support a conclusion that there was a loss of lower head integrity.

We plan to perform a gamma spectrometer survey of the cavity under the reactor pressure vessel as recommended by B&R as part of the fuel accountability effort on a "non-interfering basis" with defueling.

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We will inform you of the final results of the B&W evaluation when they are received; we are requesting a timely response. In the interim, we identify no basis to doubt the integrity of the lower head and we shall proceed accordingly with the ongoing reactor vessel defueling activities.

Sincerely,

F. R. Standerfer
Director, TMI-2

FRS/eml

Attachment

cc: Regional Administrator - Office of I&E, Dr. T. E. Murley
Director - TMI-2 Cleanup Project Directorate, Dr. W. D. Travers
President - Burns and Roe Company - W. R. Cobean, Jr.

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Warren R. Cobean Jr.
President

Subject: W.O. 3770-06
Technical Assistance and Advisory Group
TMI-2 Recovery Program
Under Vessel Dose Rates

References: 1) Letter from W.H.Hamilton to F.R.Standerfer, "Under Vessel Examination", Oct. 17, 1986
2) Letter from W.R.Cobean,Jr. to F.R.Standerfer, "QAD-Study TMI-2 Under Vessel Dose Rates", Jan. 7, 1987
3) Letter from W.H.Hamilton to F.R.Standerfer, "Inspection of the Underneath Side of the TMI-2 Reactor Vessel", Aug. 29, 1986

Attachment: Summary of Conclusions

January 16, 1987

Mr. Franklin R. Standerfer
Director, TMI-2
GPU Nuclear Corporation
Post Office Box 480
Middletown, PA 17057

Dear Frank:

On January 13, Mr. C. W. Hess met with members of your staff to discuss the analysis sent to you with Reference 1). They also discussed the new analysis sent to you with Reference 2). The results of that discussion are summarized in the attachment.

Despite areas of disagreement, there was agreement on several points. The primary point of agreement is that the existing ion chamber data is inadequate to totally resolve the issue of whether or not there is ex-vessel fuel in the cavity. As a result, they agreed that the best course of action is to perform the gamma spectrometer survey of the cavity, currently being planned as part of the fuel accountability effort. It was agreed this measurement should be planned to be performed when the water has been pumped out of the basement, exposing whatever is on the floor. Prior to performing this, or some other definitive measurement, no compelling evidence exists to confirm or disprove the presence of fuel beneath the reactor vessel, or the related issue of integrity of all of the incore guide tubes.

I would like to emphasize that the condition of the lower head penetrations is not a new issue. It was addressed earlier by TAAG in Reference 3). Although Reference 3) recommends one particular type of inspection, the need for the inspection, not the method, is what I believe to be important. Other than performing confirmatory measurements, no other action seems warranted at this time based on these analytical results. The uncertainties inherent in such calculations and the existing measurements make them inadequate by themselves to determine the condition of the vessel.

If there are any questions or comments with regard to this matter, please feel free to contact Mr. C. W. Hess or me.

Very truly yours,

Warren R. Cobean, Jr.

WRC:cs
Attach.

cc: TAAG Members
W. D. Travers, NRC
W. Bixby, DOE
E. Kintner, GPUN
R. Schwartz, EG&G
R. Lambert, EPRI

Attachment

Summary of Conclusions

Three calculations have been performed recently to model the dose rates in the cavity beneath the reactor vessel. A meeting January 13 at TMI-2 brought together the participants to discuss the results of the calculations.

The areas of agreement are as follows:

1. The fuel debris in the lower vessel head is not the major radiological source in the cavity. The shielding provided by the pressure vessel reduces the dose rate contribution from the fuel debris inside the lower head to 200/300 mR/hr.

2. The calibration of the ion chamber in water is inappropriate for this application. The dose rates in the water are too low to be credible. Assuming that the Cs concentration in the water is similar to the water samples taken elsewhere in the basement, the dose rates should be 2-4 R/hr., not 400 mR/hr.

3. The under vessel dose rate measurements are limited in range. Large quantities of fuel debris would be undetectable on the floor a few feet away. Hence, the dose rate measurements only yield information from a small fraction of the reactor vessel cavity.

4. The under vessel dose rates data are inconclusive. Different models based on reasonable assumptions can predict the measured dose rates within the accuracy of the measurements. Therefore, the differences in the models cannot be resolved by further analysis.

5. A different measurement is required to confirm the condition beneath the reactor vessel. The existing ion chamber data is inconclusive. A method that would resolve this issue is a gamma spectrometer measurement of the reactor vessel cavity via the embedded HVAC ducts.