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Received 06/10/83

June 6, 1983

Mr. Jankowski  
U.S. Nuclear Regulatory Commission  
RES/ASTPO  
Washington, DC 20555

Dear Mr. Jankowski:

At the last meeting of the Peer Review Group for the accident source term program, it was proposed that tellurium be released at the same rate as iodine for high rates of Zircaloy oxidation. Partial justification for this thesis was data from TMI-2 as presented in a paper handed out at the meeting. As I stated for the record, it is my opinion that the tellurium data reported from TMI is inconsistent and inconclusive. If this data is to be used as a basis for tellurium releases, the original counting sheets should be reviewed to determine the accuracy of the reported results.

As I understand, you presently are attempting to do this. I am including a brief discussion of the tellurium measurements that I am aware of and the questions raised in my mind from the reported results.

I would appreciate being kept informed of your investigation.

Sincerely yours,

C. D. Thomas, Jr.

C. D. Thomas, Jr.  
Radiological Engineering Group

CDT/lmm

Attachments

Marion, please send a copy to D. Powers (SHE)  
and R. Wichner (ORNL).  
In addition copies to MS, WP, LC  
Thanks,  
MT

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PDR FOIA  
ALVAREZ85-110 PDR

Some Comments on Reported Tellurium  
Measurements at TMI-II

Reactor Coolant Sample #1

This sample was taken at 1600 on March 29, 1979 and analyzed by Bettis Atomic Power Laboratory (BAPL) and Babcox and Wilcox (B&W). B&W did not report Tellurium in the sample. BAPL reported only  $^{132}\text{Te}$  at 0.086% of the total core inventory (compared to 8.41% for  $^{131}\text{I}$ ).<sup>(1)</sup> It is suggested that this analysis be reviewed to determine if the presence of  $^{132}\text{Te}$  is in fact correct. In particular, should other nuclides of Tellurium have been detected (probably a strong function of the time the sample was counted). In addition, again depending on the time the sample was counted, was a possible interference from  $^{138}\text{Cs}$  considered?

Reactor Coolant Sample #2

This sample was taken at 0730 April 10, 1979 and was analyzed by BAPL, B&W, ORNL and Savannah River Laboratory (SRL).<sup>(2)</sup> With the exception of BAPL, the results are not generally available. Of interest in the BAPL results is that only  $^{132}\text{Te}$  and  $^{103}\text{Ru}$  showed fractions of core inventory less than the first RCS sample. The results of these sample analysis should be reviewed to substantiate the  $^{132}\text{Te}$  and examine the possibility of other Te's present. In particular, should  $^{129}\text{Te}$  and  $^{129m}\text{Te}$  be detected?

Sump

The sump was sampled on August 20, 1979 and analyzed by ORNL.<sup>(3)</sup> The solution shows  $^{129}\text{Te}$  present but not  $^{129m}\text{Te}$ . The solids show  $^{129m}\text{Te}$  present but not  $^{129}\text{Te}$ . The reason for this and the absence of  $^{127m}\text{Te}$  and  $^{127}\text{Te}$  are not clear.

Another sump sample was taken by B&W sometime later but never reported.

A sample taken and analyzed by EG&G in May 1981 reported no Te in the sump solution or solids. Should their AA technique have detected Te?

Containment Air

The containment atmosphere was sampled during the period April 29, 1980 to May 2, 1980 and analyzed by EG&G.<sup>(4)</sup> The reported  $^{129m}\text{Te}$  concentration is questionable as is evident from the footnote in Table 14. Should not  $^{129}\text{Te}$ ,  $^{127}\text{Te}$  and  $^{125m}\text{Te}$  also have been detected?

Penetration Seal Plate

This sample, taken August 28, 1979, was analyzed by ORNL.<sup>(3)</sup>  $^{125m}\text{Te}$ ,  $^{127m}\text{Te}$  and  $^{129m}\text{Te}$  were measured. The ratios do not appear correct, and the absence of  $^{129}\text{Te}$  and  $^{127}\text{Te}$  is not understood.

# References

1. C. A. Pelletier, C. D. Thomas, Jr., R. I. Ritzman, F. Tooper, Iodine 131 Behavior During the TMI-2 Accident, EPRI Nuclear Safety Analysis Center Report NSAC-30, November 1981.
2. W. N. Bishop, D. A. Nitti, N. P. Jacob, J. A. Daniel, Fission Product Release from the Fuel Following the TMI-2 Accident.
3. Letter R. E. Brookshank to Dr. Ben Rusche, September 12, 1979.
4. J. K. Hartwell, J. W. Mandlor, S. W. Duce, B. G. Motes, Characterization of the Three Mile Island Unit-2 Reactor Building Atmosphere prior to the Reactor Building Purge, GEND-005, May 1981.