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Dear Mike:

There was significant new work presented at your BMI-2104 review meeting two weeks ago in Washington, D.C. Of particular note were the ice condenser model presented by A. K. Postma; the cesium and tellurium considerations, the high pressure aerosol generation work and the deposition velocity explanation, all discussed by D. A. Powers; and the preliminary computer code verification/validation studies reviewed by T. S. Kress. All these works represent significant advances in areas of potential importance to the estimation of light water reactor accident source terms.

Although there has been much progress toward improved source terms, there are still some potentially important problems which continue to be underaddressed. Four problems which were not pointed out at the BMI-2104 review meetings, yet which should be considered, are the following:

1. The omission of boron carbide from the initial BWR core inventory seems questionable for at least two reasons. First, there is the potential for a rather large contribution by boron carbide to the aerosol mass [due to oxidation of the control rod materials to relatively volatile species such as boron oxides (R. Sallach, SNL)]. This could drastically alter the total aerosol mass estimated to be formed in the coolant system and thus affect the predicted transport of many radionuclides. Second, there is the potential for substantial reaction of the boron oxides with other species. Such reactions could significantly alter the chemical (and physical) forms of some radionuclides, for example, the boron oxides might react with cesium iodide to form cesium borates and thus to "liberate" iodine (Sallach).

2. The neglect of differences in the in-vessel composition of corium due to accident sequence dependences does not seem reasonable. For example, for a Mark I BWR, it seems unlikely that the melt for a relatively rapid sequence such as AE would have the same mass of structural

materials incorporated into the melt as a relatively slow sequence such as TW. As in the case of boron carbide, this could affect the estimated aerosol mass and thus the predicted behavior of many species.

3. The treatment of the reactor building fire protection system in the overall source term effort seems unbalanced. It is not obvious why the fire protection system is considered only for the Mark I BWR plant and not for the other plants. (For example, why isn't that system considered for the PWRs in sequences in which the containment spray system fails?) In addition, for the Mark I, the draft tends to overstate the importance of the fire protection system with respect to fission product mitigation. [At least for Browns Ferry (a Mark I BWR), performance of the fire protection system during many scenarios would pro[illegible] not be optimal and in some cases could adversely affect the r[illegible] environment, for example, by flooding needed pumps.]

4. [illegible] procedures for estimating source terms for both e[illegible]d equipment qualification is not justified unless those p[illegible] are realistic. However, the procedures being used are not realistic. Because they tend to default on the conversative side with respect to estimating radioactive releases to the environment (as a result of their historical development), their use for equipment qualification is questionable.

As usual, I am looking forward to receiving the materials for the next source term review meeting. It is exciting to see all the progress which is being made.

Sincerely,

S. J. Niemczyk

SJN:bcd

cc: T. S. Kress
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