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December 14, 1976

Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Attention: Docketing and Service Section

Gentlemen:

Regulatory Guide 1.7, "Control of Combustible Gas Concentrations
in Containment Following a Loss-of-Coolant Accident," Revision 1
(September 1976)

In this letter we wish to comment on the above captioned regulatory guide.

Of the several mechanisms discussed for hydrogen gas production following a loss-of-coolant accident we are concerned here about the contribution from radiolytic decomposition of the emergency cooling solutions. On page 1.7-5 it is correctly pointed out that the rate of production of gases from radiolysis of coolant solutions depends on "(1) the amount and quality of radiation energy absorbed in the specific coolant solutions used and (2) the net yield of gases generated from the solutions due to the absorbed energy." As noted elsewhere in the guide, some of this coolant will be present in the form of steam, at least during early times in the post-LOCA evolution. Since it is known that the hydrogen yield (G-value) for steam is significantly larger than for the liquid by a factor of 10 to 30, we believe that consideration should be given to the effects of steam radiolysis. The G-value for steam has been reported to be in the range from 6 to 13.6 molecules/100 eV depending on the quality of the steam and the physical conditions. These values may be compared to the "conservative" value of 0.5 molecules/100 eV assumed in Table 1 of the guide. Although the precise values for steam are not well established and were not measured for the estimated conditions of a LOCA, the values are sufficiently large so as to pose a potential problem. At the very least an evaluation should be made of the magnitude of the contribution to the total hydrogen from steam radiolysis. To our knowledge no such evaluation has been made and it is apparent that the recommended G-value does not include allowance for steam.

We sincerely hope that these criticisms of the Regulatory Guide 1.7 will be given due consideration and will serve to improve the guide.

Sincerely yours,

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