

ALB

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TO: A. Bates

FROM: Ivan Catton

SUBJECT: Comments on 24 April 1980 Ad Hoc Site Meeting on Natural Circulation

Natural circulation cooling and under some circumstances reflux cooling of the core are essential to a safe conclusion of a number of transients. Understanding the phenomena is important if no full scale tests will be run. The meeting went a long way in helping us understand the natural circulation mode of cooling. Some questions or comments did come up during the meeting that deserve comments. They are found in the following paragraphs.

BSR

1. Semiscale and LOFT have begun, or are planning, to run transients that include natural circulation. The planned Sequoyah and North Anna tests combined with the Semiscale and LOFT tests present an unique opportunity for code assessment. It does not appear as if the NRC research staff has taken as much advantage of this opportunity as they might. In particular, someone should make sure that the instrumentation at Sequoyah and North Anna are adequate for meaningful comparisons to be made with Semiscale and LOFT.

2. I don't believe one needs to run integral tests to answer questions about the effect of non-condensable gases on reflux cooling of the core. The new FLECHT program could address this question by perturbing its program plan. Semiscale plans could be modified to give an early indication of whether or not a problem exists. There are probably other facilities available as well. LOFT tests with non-condensibles can then be carried out on an unhurried timetable.

3. The LOFT small break experiment analysis was not as complete as it might have been. The person making the presentation was not aware of the need to have a stratified flow model to account for steam and water counter flow in the horizontal section of the hot 6 g. His use of homogeneous flow in the horizontal pipe makes his results suspect.

4. Semiscale can make significant contributions to our understanding of many important phenomena. I think they should be encouraged to solve the heat loss problem on a priority one basis.

5. Professor H. Karwat of the Technical University of Munich has hypothesized that the first rapid rise in pressure noted during the third hour of the TMI-2 accident was due to hydrogen blocking the condensation process in the steam generator. He believes that hydrogen production due to a zirc-steam reaction was unlikely because clad temperatures were not high enough. His hypothesis about radiolysis leading to large amounts of hydrogen do not seem too credible. The remainder of his arguments do, however, seem to be important enough to deserve some attention. Where did the hydrogen come from?

6. The LOFT instrumentation group seems to be isolated and tends to be unimaginative. A suggestion by Prof. Acosta, bleed water over the window, would allow the Storz lense to be used. Even without it, 200 hours of operation before replacement is not unreasonable when the cost per test is taken into consideration.

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