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RECEIVED
ADVISORY COMMITTEE ON
REACTOR SAFEGUARDS U.S. N.R.C.

Dr. Milton Plesset
Chairman
ECCS Subcommittee, ACRS
Nuclear Regulatory Commission
Washington, D.C. 20555

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Dear Dr. Plesset:

This is a written consultant's report on the August 27 & 28 meeting of the ECCS Subcommittee, which concentrated on the LOFT and Semiscale experimental activities and computer code development at INEL. The report is not an attempt to summarize the meeting, but contains a few observations and opinions regarding the work and its pertinence to general needs in the area of nuclear reactor safety.

Remarks of Dr. L. S. Tong and Dr. Z. Rosztoczy

I was favorably impressed and applaud the emphasis given by both gentlemen to the need for more thought and analysis in interpreting the results of both the experimental and code-development programs, and in planning new programs. Dr. Tong urged that everyone involved use their brains more in trying to digest and distill information being accumulated; Dr. Rosztoczy urged NRC and EG&G to increase their analytical support ("analytical" in the sense of analyzing experiments and calculations, not merely in terms of increasing the number of computer runs). I believe this is very important, but will not be achieved by jawboning alone. I think that some definite changes in policy or research organization will be necessary before one sees a significant increase in the integrated thought or cohesive analysis that is sought, and that the ACRS should encourage this.

Presentations by the Staff of INEL:

General The quality of the presentations by the staff of INEL has always been impressive and was at this meeting also. The technical level of work is good, and the researchers seem cognizant of instrumentation and system limitations.

LOFT & Semiscale LOFT represents the largest single item in the NRC Research budget and is beginning to pay substantial dividends. Rearrangement of the scheduled experiments to emphasize small breaks and operational transients appears to be a sound policy. The prototypicality

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of Semiscale was questioned at the meeting, and the question raised as to whether it should be regarded as a "system" or as a "separate effects" facility. Its versatility and the speed with which new experiments can be scheduled for it make it attractive as a research facility, but the usefulness of the results must be questioned.

Semiscale is not large enough to be considered prototypical of any existing power reactor system, and doing so will only lead to problems. It is useful for examining some one-dimensional phenomena, and it is also useful for investigating the validity of scaling laws, but in this case also limited to one-dimensional behavior. I strongly question whether it should be expected to play an important role in studying basic system phenomena, as asserted in one of the slides shown by Gary Johnson, but agree that it is useful in code assessment and in examining the effects of scale.

Code Development Developments in this area were reported for codes RELAP 4-Mod 7, WRAP, TRAC-B, RELAP 5, and BEACON. For the most part, the work appeared to be sound with steady but unexceptional progress. In some areas, e.g., inter-phase mass transfer and non-equilibrium effects, I question the data base on which models are being constructed, but do not have specific information that would refute what is being done. I think it would be useful to the Committee to learn how sensitive the calculated results are to the precision of such models. In some cases the work gives the impression that a model is being introduced to eliminate numerical instabilities and not because of data that support a specific description of the physical phenomena.

Activity in Reaction to TMI-2 Toward the end of the two-day meeting I developed a strong impression that TMI-2 had generated a spate of "reactive" activity. Work undertaken during the event was necessary to try to mitigate harmful consequences. It was also probably necessary to find out whether system codes and experiments would confirm the general sequence of events that occurred in TMI. Additional post-mortem examinations, however, do not seem likely to provide much information that will be helpful in preventing future accidents of this type, even if it is understandable that researchers are anxious to show that experimental facilities and computer codes can reproduce the general course of the TMI-2 event. Perhaps such activities have now run their course except in reaction to requests by one of the investigative committees.

Sincerely yours,

Kermit L. Garlid

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Associate Dean

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