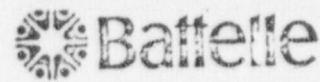


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August 21, 1978

Dr. A. Bates
Advisory Committee on Reactor Safeguards
Nuclear Regulatory Commission
1717 H Street
Washington, D. C. 20555

CT-1035
PD R 10/6/78

Dear Dr. Bates:

FLUID DYNAMICS AND ECCS SUBCOMMITTEE MEETINGS
IDAHO FALLS, AUGUST 14 & 15, 1978

The following are several comments that I would like to offer to the ECCS and FHDE Subcommittees on selected topics considered during the August 14 and 15 meetings:

LOFT

The present LOFT schedule calling for only three tests per year was described as based on potential problems anticipated during the decontamination and reloading. Based on numerous observations of similar procedures on other reactor system, it appears to me that this schedule may be somewhat over conservative. I suspect that unless disastrous consequences occur in one or more tests, it will be possible to accelerate the schedule substantially. Perhaps, some of the time made available by accelerating the schedule can be used constructively for implementing the acquisition of additional important data on structural response of the LOFT system.

During Mr. Naff's presentation of the L1 test series, the anomalous mechanical behavior of the core and vessel in comparison to prediction was dismissed because "...LOFT was not meant to take structural data". This is unfortunate since LOFT could have provided a useful tool for developing and assessing hydrodynamic/structural codes that describe fluid/structural interactions and the overall mechanical response of reactor systems to the LOCA event. If the time and wherewithall was available because of an accelerated schedule; I would recommend that strong consideration be given to providing at least sufficient instrumentation (i.e. load cells, strain gages, ΔP cells) as may be required to resolve the anomalous data observed in Series L1 and perhaps to provide some additional data on vessel hold down forces, piping deflections, etc. such as may be useful to structural dynamicists.

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SEMISCALE

I concur with Drs. Isbin's and Plesset's concerns regarding the incapability of the Semiscale downcomer to simulate the non-axisymmetric behavior observed in Creare and B-CL tests. The semiscale facility is strongly one-dimensional and cannot be relied upon to provide any typical information on two or three dimensional effects expected in the downcomer, core, lower and upper plenum regions. The results of Semiscale may be extremely useful in assessing the one-dimensional aspects of one-dimensional codes such as RELAP. However, the results should be amply qualified to discourage the formation of erroneous conclusions by those not thoroughly familiar with the shortcomings of the facility's modeling.

TWO-PHASE FLOW INSTRUMENTATION

The development of two-phase flow instrumentation is an extremely important task if maximum benefit is to be obtained from the currently planned experimental program in the U. S., Japan and Germany. The results of this program to date appear to be excellent, yet much remains to be done. The availability of larger facilities for development and calibration of the types of instrumentation required for the 2D/3D program is somewhat limited. Strengthening the program in this area may result in enhanced technological returns through greater accuracy, sensitivity and reliability of 2D/3D instrumentation.

PBF

I am somewhat concerned by the DNB results of the PCM-1 tests described by Mr. Maynard. These results indicated that DNB was experienced at surface heat fluxes approximately 12 percent lower than predicted by the W-3 and B&W-2 correlations. These correlations are based on data from electrically heated fuel pin models, whereas the PBF data is, of course, obtained with real fuel pins. There has been concern in the past that the atypical thermal diffusivity of electrically heated pins may distort their CHF behavior, and these PBF data may be interpreted to confirm this concern. If true, the operating levels of existing and planned reactors may need to be re-evaluated. However, it is more likely that these lower CHF values result from errors in the lengthy procedure used in determining the power levels in the PBF pins.

I obtained the impression from the presentation that INEL had little inclination to resolve this apparent discrepancy. However, I believe that it is of the greatest importance that the reason for the discrepancy be identified to enable the reaffirmation of the applicability of the existing CHF data base.

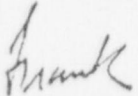
RELAP 4 AND 5

I am concerned with the rapid advancing complexity and extreme detail being incorporated into the RELAP codes. From personal experience in supervising a group of individuals using an earlier version (i.e. MODV), I have observed that it takes very highly trained and extensively experienced personnel to successfully use RELAP. I personally would find it easier to accept the results of a simpler, easier to use code that produces demonstrably conservative results than a sophisticated, long running code that must be figuratively tricked and conjured to make it work.

Furthermore, I would like to question the justification of adding this complexity to the RELAP code which is only a one-dimensional code and subject to errors inherent to its inability to describe the important three-dimensional phenomena present in the downcomer, core and upper plenum. Such detail and complexity cannot eliminate the basic shortcomings of a one-dimensional code, but will only serve to lull on-lookers into a sense of security with demonstration of intellectual cunning and computerized magic.

I feel that code development time might be better used if an attempt was made to eliminate the shortcomings of the one-dimensional approach in regions where multidimensional effects are important. I do not claim to be a computer code expert, but it seems to me that the general approach being used in the BEACON code to incorporate both one and two dimensional regions into one code may have some advantage if applied to a code like RELAP. I suggest that this be given some consideration.

Sincerely,



Dr. F. R. Zaloudek
Staff Engineer
Special Projects

FRZ:fo