MEMO

CT-1315

To: M. S. Plesset, ACRS

From: T. Y. Wu

Subject: ACRS/ECCS Subcommittee Meeting October 22-23, 1980,
         Idaho Falls

The meeting was timely to review the recent results of the Semiscale and LOFT tests on transient system responses to small break LOCAs. A topic that has emerged to attract more attention is the effect of main coolant pumps on and pumps off operations subsequent to a SBLOCA and in this connection the desired criterion for mitigating hazards to the nuclear reactor safety. These test programs are of great value to NRC regulatory needs for data upon which to evaluate ECCS models.

The pros and cons of pumps-on-or-pumps-off operations during SBLOCA were very excellently deliberated by Brian Sheron with special reference to reactor safety and recovery. The problem seems to be very complicated as it requires clarification of various physical effects such as the break size, break orientation, local flow stratification and degree of subcooling, degradation of pumps in prolonged working with a two-phase flow, etc.; and this may not have exhausted the list. To this list marking a lack of our understanding, I would like to add two more aspects. First, it should be of importance to investigate the long-duration transient behavior of the local break flow in respect to changes in stratification, phase separation, void fraction, rarefaction propagation and discharge rate while under a continuous (local) depressurization. Results from such a study are necessary for code improvement. The other point, as reflected on the scarceness of data on pump performance in two-phase flow regimes, is to stress the need of conducting more long-duration pump performance tests with two-phase flows to supplement the Semiscale pump tests and EPRI 1/3-scale pump test results. The long-duration performance data are necessary for code improvement in predicting long-duration transients (should the RCP's be allowed running) and for making judgement on pump trip in order to insure restart of the RCP's.

My overall impression of the Semiscale test program is that it is well planned and well conducted. I am in favor of seeing the Semiscale facility used primarily for code assessment. It would be a great success if the result of so using Semiscale data can help ascertain the weak parts of a code pinpointed to the relevant physical factors (mentioned above) so that they can be more accurately modeled.