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NUCLEAR REG. COMM.  
ADVISORY COMMITTEE ON  
REACTOR SAFEGUARDS

MEMORANDUM FOR: R. Savio  
 FROM: I. Catton *I. Catton*  
 SUBJECT: ADVANCED REACTOR SAFETY RESEARCH

SIMMER as it is presently constituted is weak in a number of respects. Limitations are imposed by assuming a droplet field and associated assumptions regarding drop size and heat transfer. The droplet field is a mixture of UO<sub>2</sub> and steel drops and no segregation is allowed. The observed tight coupling of neutronics to heat transfer and fluid dynamics is not surprising but points out the need for putting the thermal hydraulics on a sound footing. SIMMER does not include thermal radiation as a heat transfer path. At this time, calculations of accident sequences can have little meaning and may even be counterproductive. The SIMMER code development does not seem to have evolved very much during the past several years. It may be that the desired goals cannot be achieved. In any event, much more attention needs to be paid to the physical processes being modeled and less to running the code. I see very little in the future plans for SIMMER that will make it better.

A number of excellent experimental programs are being conducted at SANDIA. The transition phase experimental program being based on behavior of 3 mm fuel pin deserves some justification. The small scale may change the course of events. The experiment where a coarse pre-dispersed mixture in sodium is pulsed will yield a great deal of information on FCIs. Further, in-pile bed dryout experiments are not needed.

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