

INTERIM REPORT

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Division of Reactor Safety Research

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Prepared for
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Washington, D.C. 20555

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July 20, 1979

Mr. Mel Silberberg, Chief
Experimental Fast Reactor Safety
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Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mel:

Program Title/Activity Identification

Aerosol Measurements and Modeling for Fast Reactor Safety

Current Progress and Technical Highlights

Major efforts during June concerned the completion and submission for initial review of the "HAARM-3 Code Verification Procedure", analysis and report preparation on the topic of aerosol resuspension, preparation of the procedures to be used in comparing the CRAB, QUICK, and HAARM-3 codes, and continuation of the experimental work on measurement of mixed aerosol properties. In addition, a review meeting was held at the NRC on June 7 to discuss the status of work on this project.

The code comparison effort is to employ an expected range of aerosol properties and accident conditions to permit selection of values for dimensionless groups used in the CRAB and QUICK codes. The use of dimensionless groups will allow for fewer computer runs while still permitting a wide range of conditions to be investigated. The intent of the comparison is to identify limits in range of applicability for the HAARM-3 code as imposed by its assumption of a lognormal particle size distribution and to scope the regions of operability for the CRAB and QUICK codes.

The experimental studies gave a practical verification of the feasibility of using a fluorometric technique for analyzing UO_2 mass at the low mass levels encountered in the spiral centrifuge deposits. The resolution of particle sizes in the centrifuge was less than satisfactory; however, this was the result of inadvertent use of different density gases for carrier and aerosol streams and has been corrected. Creation of mixed Na and UO_2 aerosols was proven satisfactory for the case of alternate evaporation of the two components.

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Work on drawings and minor corrections to the report on "HAARM-3 Code Verification Procedure" proceeded satisfactorily and a draft report for wider review is expected to be mailed in early July.

Anticipated Accomplishments for July

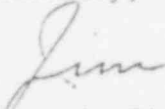
During July the comparisons among the CRAB, QUICK and HAARM-3 computer codes is expected to be completed and efforts on a multiple zone code employing an advanced code begun. Measurements of UO₂-Na aerosols will be continuing. The aerosol resuspension analyses and report will be completed as will the corrected "HAARM-3 Code Verification Procedure".

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The estimated and actual cumulative costs are shown in Figure 1.

Sincerely,



James A. Gieseke, Research Leader
Physico-Chemical Systems, Atmospheric
Science & Aerosol Technology Section

JAG:ld

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