

PDR

LETTER REPORT

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Washington, D.C. 20555

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LETTER REPORT



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July 2, 1981

Mr. Steve Bernstein
U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Transportation and Materials Risk Branch
Standards Section
Mail Stop NL 5650
Washington, DC 20555

Dear Steve:

ACCIDENT AEROSOL CHARACTERIZATION-JUNE MONTHLY REPORT

Through May 31, 69.2% or \$347.5K of the available operating funds have been spent.

PROJECT MANAGEMENT

FY-81 operating expenditures through May 31, 1981 were \$347.5K, which is 69.2% of the available \$502K. The corresponding working period (October 1-May 31) was 66% of the available time in FY-81. The expenditures from April 27-May 31 were \$55.6K.

Operating expenses were high during May due to activities of the whole team preparing for the June 2-4 RRG meeting.

The Schedule of Deliverables is attached and discussed below where appropriate.

TASK A. LITERATURE REVIEW, PROGRAM PLANNING, HANDBOOK INPUT

A first draft of the literature search document "Accident Generated Particulate Materials and Their Characterization: A Review of Background Information" was submitted this month.

For the Accident Analysis Handbook (AAH), the following drafts were submitted in May: Sections 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7, and part of 4.1.5.1.

The first work on Simple Sample Fire Problem was prepared for presentation at the RRG meeting.

Mr. Steve Bernstein

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TASK B. AEROSOL GENERATION EXPERIMENTS

PRAC experiments continued in May. Three runs with 100 g TiO₂ at 50, 250, and 500 psig resulted in 8, 21, and 29 weight percent airborne respectively. Comparable PARE experiments yielded 4, 18, and 24 weight percent airborne.

"Experimental Plans: Experiments to Measure Aerosols Generated by Pressurized DUO Powder Releases" outlining the next experimental matrix was drafted. This program should begin sometime near the end of June when the PRAC releases are completed.

The paper based on free fall spills that was presented by Sue Sutter at the American Industrial Hygiene Conference in Portland was well received. James Johnson, Lawrence Livermore Laboratory, is performing related experimental work and suggested that our programs could both benefit from cooperative information exchange.

TASK C. FIRE GENERATED PARTICULATE TESTS

An early version draft of the literature review "Characteristics of Combustion Products" was submitted for review. However, significant new data obtained in March and April have yet to be incorporated into this document. We anticipate a July finishing date for this next version.

The data for the literature review has been summarized for presentation at the June 2-4 RRG meeting. Here we will show the best data available that give energy, and combustion product (including particulate) information during combustion. We will point out the areas where data is lacking and suggest an experimental plan for filling the missing gaps. This experimental plan will involve significant subcontracting to another organization.

Jofu Mishima, Martin Chan and I observed an experimental burn at Lawrence Livermore National Laboratory (Norm Alvares). This was done to see how the LLNL experimental apparatus could be of benefit to the program as far as predicting combustion products (especially smoke) in fires larger than those of the literature review.

TASK D. FAILED COMPARTMENT TESTS

An early draft version of "Aerosol Computational Models" - a literature survey, was submitted this month and a slide presentation for the June RRG meeting was prepared on this topic.

Mr. Steve Bernstein

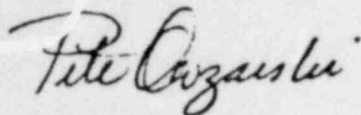
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TASK E. ANALYTICAL MODEL VERIFICATION/SUBSTANTIATION

During the preparation of the Sample Fire Problem for the AAH in Task A, we discovered that fires of sufficient intensity or duration could overpressurize the compartment of the fire and send airborne radioactive materials through many diverse paths other than through the designed ventilation flow path. We have developed a set of criteria via a model for determining whether a given fire can overpressurize the compartment. This set of criteria can greatly simplify the analysis of those small fires incapable of overpressurizing the room by identifying this lack of overpressurization potential. This will be presented at the June RRG meeting.

Sincerely,



P. C. Owzarski
Applied Meteorology & Emissions Assessment
Atmospheric Sciences Department

PCO:dh

Enclosure

cc: HW Godbee/EJ Fredrick - ORNL
WS Gregory/RA Martin - LANL

PII SCHEDULE/PROGRESS OF DELIVERABLES - FY-81TASK A - LITERATURE REVIEW, PROGRAM PLANNING, HANDBOOK INPUT

1. Program Plan Document - Scheduled Publication with LASL: February 1981
Percent Complete 85
2. AAH (MOX) Chapters
Percent Complete 2-30%, 3-30%, 4-20%
3. Literature Survey Document - Scheduled Publication: February 1981
Percent Complete Task B - 95%; Task C - 85%; Task D/E - 80%

TASK B - AEROSOL GENERATION EXPERIMENTS

1. Unpressurized Release of Powders and Liquids
Experiments done by December 1980. Percent Complete 100
Draft Document by February 1981. Percent Complete 100
2. Pressurized Release of Powders
Experiments done by June 1981. Percent Complete 60
3. Pressurized Release of Liquids
Submit Experiment Plan by June 1981. Percent Complete 100
4. Additional RART Tests
Submit Plan by March '81 RRG Meeting. Percent Complete 100

TASK C - FIRE GENERATED PARTICULATE TESTS

1. Literature Search, see Task A.1
2. Combustion Products Experiments
Exp. Plan by January 1981. Percent Complete 85
3. Combustion Prod. & Extraneous Particulates
Exp. Plan by July 1981. Percent Complete 80
4. Fire Particulates - Near Field Behavior
Study need - no deadline

TASK D - FAILED COMPARTMENT TESTS

1. Intact Glovebox Experiments
Submit plan by December 1981. Percent Complete 10
2. Failed Glovebox Experiments
Submit plan by December 1981. Percent Complete < 5

TASK E - ANALYTICAL MODEL VERIFICATION/SUBSTANTIATION

1. Preliminary Evaluation of Faulted Container Flow & Particulate Models
Submit with Task A.1
2. Free Fall Spills First Model
Submit draft by July 1981* Percent Complete 10

*Deadline to be changed to later date.