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G. S. Lewis, Systems Performance Research Branch, SAFER:RES

This document was prepared primarily for preliminary or internal use. It has not received full review and approval. Since there may be substantive changes, this document should not be considered final.

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INTERIM REPORT

NPC Research and Technical
Assistance Report

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July 15, 1980

G. S. Lewis, Jr.
Systems Performance Branch
Safeguards, Fuel Cycle and
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U.S. Nuclear Regulatory Commission
MS 1130-SS
Washington, DC 20555

Dear Lew:

ACCIDENT AEROSOL CHARACTERIZATION - JUNE MONTHLY REPORT

Approximately 70% of the operating funds authorized in FY-80 (approximately \$272K) has been spent.

TASK A. PROJECT MANAGEMENT

At the end of June, approximately \$272K of the \$390K in operating funds authorized for FY-80 has been expended. The funds spent in June (\$30.8K) bring the total project spendings to \$405K of a total of \$525K authorized. There are \$105K remaining. FY-80 spending is at 70% with 75% of the time expended.

TASK B. DEFINE MAJOR, CREDIBLE ACCIDENTS FOR MOX PLANTS

Las Cruces - New Mexico State University, Meeting June 4-6, 1980

Jofu Mishima and Pete Owzarski from PNL met with Lew Lewis of NRC, LASL personnel, and Phil Smith of NMSU to interact on planning analytical and experimental efforts. With facility fires as the number one priority major accident type to be considered, joint planning between PNL, LASL and NMSU began. The major goal agreed on was to provide NRC with a Project Justification Document that details the tasks, the deliverables and timely interactions between PNL and LASL.

As a result of the above meeting PNL agreed to reevaluate their fire parameters in a fashion similar to LASL. The results of this new ranking system was submitted to NRC for approval. This ten page part of an appendix in the Justification Document listed the top seven ranking fire parameters as:

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	<u>Rank</u>
Fire Generated Particle Size Distribution	1-3 tie
Fire Generated Particle Mass/Number Concentration	1-3 tie
Filter Performance	1-3 tie
Fire Conditions - Combustion Products	4
Particle Agglomeration	5-6 tie
Particle Dilution	5-6 tie
Fire Conditions - Rate	7

The reasons for relative importance, uncertainty, and potential for decrease in uncertainty were discussed for the top seven above.

Oak Ridge National Laboratory - Meeting June 18, 1980

Jofu Mishima of PNL met with H. Godbee, E. Fredrick and E. Compere of ORNL, and W. Gregory and R. Martin of LASL to discuss aspects of the User's Handbook (or Sourcebook). The main topic was the body of facility and preaccident descriptors needed for waste management facilities.

TASK D. EXPERIMENTS TO CHARACTERIZE ACCIDENT GENERATED AEROSOLS

On June 16 the decision to proceed with free fall experimental studies using uranium was received. These experiments were discussed at NRC Headquarters May 29, and presented in the PNL planning document by S. L. Sutter and J. W. Johnston entitled "Experiments Proposed to Measure Aerosols Generated by Free Fall Spills of Uranium Powders and Natural Uranium Solutions." Preparations for the uranium experiments were begun.

The direct laser fluorometric determination of uranium in solution was selected for the uranium chemical analysis. Procedures were set up to test the reliability of the chemical method, variations between duplicates of a sample, and between technicians.

An auxiliary liquid radioactive waste tank was installed at 242-B. Liquid waste must be chemically analyzed before permission is given for disposal to a retention basin. This tank should enable continuous operation while samples are analyzed. A procedure for analysis of the waste water was established concurrently.

The design of the proposed wind tunnel at 242-B is being reviewed while installation detailing - footings, location of existing buried cable, etc, - continued Vendors interested in fabricating the fiberglass reduction nozzle have been located. Fan curves have been requested so we can confirm fan selection and begin purchasing the blower system.



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A "powder gun" for explosively releasing powders requires fabrication of a control panel. Gages used in previous work will be used and these have been sent for calibration.

At the May meeting at NRC Headquarters, some concern was expressed as to potential resuspension from the proposed sampling method using hi volume samplers. This was investigated in 2 runs using 1000 g TiO_2 powder traced with uranine. These experiments showed that only a small fraction, 0.2% or less, of the total airborne material might be directly attributed to resuspension. For these experiments, the powder was placed on the RART floor while samplers were covered and allowed to stabilize overnight. Then samplers were uncovered and run for 1/2 hour.

All of the static air free fall experiments using uranine traced powder have been completed. They show that source size and spill height are significant parameters in airborne releases from spills. The total mass airborne ranged from 0.0036 g for a 25 g spill from 1 m to an average of 1.22 g from a 1000 g spill from 3 m.

Runs with uranine solutions were terminated to enable preparation for the uranium powder work. The solution spills show trends similar to the powder with source size and spill height significant.

Sincerely,

A handwritten signature in cursive script that reads "Pete Owzarski".

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

PCO:dh

cc: W.S. Gregory/R.A. Martin - LASL
K.W. Godbee/E.J. Fredrick - ORNL