



UNION CARBIDE CORPORATION
NUCLEAR DIVISION
P.O. BOX X, OAK RIDGE, TENNESSEE 37830

July 15, 1982

Mr. S. Bernstein
Transportation and Materials
Risk Branch
Division of Risk Analysis
Office of Nuclear Regulatory
Research
Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Bernstein:

Attached is our first monthly report covering late May and June 1982 activities of UF₆ Accident Analysis Handbook project (FIN B0495-2). In May and June, \$16,917 were spent. Expenditures so far through the end of June total \$16,917.

Sincerely,

M. Siman-Tov

MS/WPH/blm

Attachment

cc: W. R. Bibb, DOE-ORO
G. F. Flanagan
A. L. Lotts
D. W. Sheffey, DOE-ORO
E. O. Sternberg

cc/att: W. S. Gregory, LANL
P. C. Owczarski, BPNL

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CF SUBJ

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ADR

PROGRAM TITLE: Definition of Scenarios and Controlling Parameters
for Major Accidents Involving UF₆ at NRC-Licensed Fuel
Cycle Facilities

PROJECT MANAGER: M. Siman-Tov

ACTIVITY NUMBER: ORNL # 41 88 55 05 6 (189 B0495-2) NRC 60 19 21

TECHNICAL HIGHLIGHTS:

Funding arrived in mid-May. A seven-member team was organized from UCC-ND Engineering, including several members of the ORGDP Safety Analysis staff. Four tasks are planned which are (1) Literature Review and Scenario Identification, (2) Review of Analytical Models, (3) Identification of Important Parameters, and (4) Preparation of Final Report. Tasks 1 and 2 have been initiated while Tasks 3 and 4 are FY-83 activities.

Task 1A: The UCC-ND library system was searched for NRC docket information for eight NRC-specified facilities with little information being found. A computer search of NRC dockets was then requested from the NRC Public Document Room. Also, a request was made through the NRC project contact, S. Bernstein (NRC-RES) for relevant NRC documents. W. T. Thompson (UCC-ND) visited the NRC licensing file library at Silver Springs, MD, on June 18 and scanned several dockets with the assistance of the NRC-licensing staff. Approximately 90% of the NRC documents relevant to this review have either been received or ordered from the NRC Public Document Room.

Since the NRC documents already reviewed have not contained detailed accident scenario information, it was agreed with S. Bernstein that at least three site visits should be made to help define and establish credible accident scenarios. Arrangements for these visits, which are planned for early August, are being coordinated by S. Bernstein through the NRC License Division. Materials already reviewed include Environmental Impact Appraisals for Allied's Metropolis, IL, UF₆ production facility and for fuel fabrication plants in Apollo, PA, Erwin, TN, and Richland, WA. Other dockets concerning the Gore, OK, UF₆ production facility as well as facilities at Barnwell, SC, Lynchburg, VA, and West Valley, NY, were reviewed to obtain information on processes and credible accident scenarios.

Task 1B: Several members of the project team have reviewed in detail the available sections of the NRC Accident Analysis Handbook.

Task 1C: A preliminary listing of hypothetical accident scenarios is being developed from similar scenarios for DOE-owned facilities.

Task 1D: Documents already reviewed lack sufficient detail to define major UF₆ accident scenarios, although some major accident events are briefly discussed. Site visits during August will provide additional information for defining scenarios.

Task 2: D. D. Holt (UCC-ND) has completed a first-pass review of the applicability of NRC Accident Analysis Handbook (AAH) models for simulating accidental UF₆ releases. The review focused on the physical phenomena considered in the models and the basic principles from which the models were derived. The models are deficient for modeling UF₆ because the effects of chemical reactions with respect to composition and energy balances are not considered, depletion mechanisms are limited to saltation, particle size distributions are limited and do not consider the effects of particle agglomeration, and corrosive effects of UF₆ on equipment—including some safety systems—are not considered.

MEETINGS AND TRIPS:

W. T. Thompson (UCC-ND) visited the NRC Licensing File Library on June 18 to scan contents of NRC dockets for several NRC facilities. Copies of a number of documents relevant to Task 1A were obtained with assistance from William Nixon of the NRC licensing staff.

REPORTS, PAPERS, AND PUBLICATIONS: None

PROBLEM AREAS:

Relevant documents obtained so far do not provide sufficient accident scenario descriptions. Development of scenario descriptions may be difficult if sufficient details are not obtained through the site visits planned in August.

July 28, 1982

LETTER REPORT

Accession No. _____
Contractors Report No. _____

Contract Program or Project Title: Investigation of Accident-Induced Flow and
Material Transport in Nuclear Facilities

Subject of this Document: Progress reported for MAY & JUNE 1982

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Author(s): M. Siman-Tov

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Responsible NRC Individual and NRC Office or Division

Steven Bernstein, Transportation and Materials Risk Branch, DPA/RES

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