

Sandia National Laboratories

Albuquerque, New Mexico 87185

May 10, 1986

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Ms. Sandra Wastler  
Repository Projects Branch  
Division of Waste Management  
U.S. Nuclear Regulatory Commission  
7915 Eastern Avenue  
Silver Spring, MD 20910

Dear Ms. Wastler:

Enclosed is the summary of activities during April 1986 for the following tasks (A-1165): (I) Assisting in the Development of the Licensing Assessment Methodology (II) Monitor and Review Aspects of DOE programs; (III) Identifying Techniques for Probability Assignments; and (IV) Short Term Technical Assistance.

Sincerely,

*Robert M. Cranwell*

Robert M. Cranwell, Supervisor  
Waste Management Systems  
Division 6431

RMC:6431:jm

Enclosure

Copy to:

Office of the Director, NMSS  
Attn: Program Support  
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Hubert Miller  
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6431 R. M. Cranwell  
6431 R. L. Hunter

WM-RES  
WM Record File  
A1165  
SNL

WM Project 10, 11, 16  
Docket No. \_\_\_\_\_  
PDR ✓  
LPDR B, N, S

Distribution:

Wastler  
Jean-Ticket  
(Return to WM, 623-SS)

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Later in April, we prepared a rough outline of the report describing the LAM, began developing the description of the idealized methodology, and began writing the annotated bibliography. These will be incorporated into the status report due at the end of September. In addition, we are becoming familiar with Aerospace's waste-package report, NUREG/CR-4477.

PROGRAM: Monitor/Review Aspects of DOE  
& other National and Inter-  
national Waste Management  
Programs

FIN#: A-1165  
Task II

CONTRACTOR: Sandia National Laboratories BUDGET PERIOD: 10/85-  
9/86

NMSS PROGRAM MANAGER: S. Wastler BUDGET AMOUNT: \$80K

CONTRACT PROGRAM MANAGER: R. M. Cranwell FTS PHONE: 844-8368

PRINCIPAL INVESTIGATORS: R. L. Hunter FTS PHONE: 846-6337

#### PROJECT OBJECTIVES

To monitor and review the performance assessment aspects of DOE  
and other national and international waste management programs.

#### ACTIVITIES DURING APRIL 1986

No activity.

PROGRAM: Probability Techniques

FIN#: A-1165  
Task III

CONTRACTOR: Sandia National Laboratories BUDGET PERIOD: 10/85-  
9/86

NMSS PROGRAM MANAGER: S. Wastler BUDGET AMOUNT: \$163K

CONTRACT PROGRAM MANAGER: R. M. Cranwell FTS PHONE: 844-8368

PRINCIPAL INVESTIGATORS: R. L. Hunter FTS PHONE: 846-6337

#### PROJECT OBJECTIVES

To identify techniques for assigning probabilities to geologic processes and events.

#### ACTIVITIES DURING APRIL 1986

As authorized by Sandra Wastler by telephone on April 24, we have reallocated \$30K from Task II to Task III. These funds will allow the experts and Sandia Technical Staff to thoroughly review the probability report for consistency and technical excellence. This month's accounting estimates reflect this change in allocation. (Funds originally budgeted for review by the experts were used primarily for the meeting in Silver Spring on July 19, 1985.)

We distributed the draft of the probability report to the experts for review. Work on the chapters by Holland, Cornell, and Wahi is continuing. All three have assured us by telephone that drafts will be submitted in May or June.

Discussions of Chapter 3 of the probability report are taking place at the Directorate level between SNLA and LBL. LBL has assured us that they are investigating this matter and will resolve it as quickly as possible.

PROGRAM: Short-Term Technical Assistance FIN#: A-1165  
Task IV

CONTRACTOR: Sandia National Laboratories BUDGET PERIOD: 10/85-  
9/86

NMSS PROGRAM MANAGER: S. Wastler BUDGET AMOUNT: \$50K

CONTRACT PROGRAM MANAGER: R. M. Cranwell FTS PHONE: 844-8368

PRINCIPAL INVESTIGATORS: R. L. Hunter FTS PHONE: 846-6337

#### PROJECT OBJECTIVES

To provide general technical assistance on waste-management matters on the request of the NMSS PM.

#### ACTIVITIES DURING APRIL 1986

We have amended the camera-ready copy of the report "Assessing Compliance with the EPA High-Level Waste Standard: An Overview," SAND86-0121, NUREG/CR-4510, to delete citations of the draft of Chapter 3 of the probability report and to correct the title of the probability report in the references.

Suggested modifications to the report were received on April 1. Incorporation of these comments into the report is being explored. We have, however, a few preliminary comments about these suggested modifications. First, it might be more appropriate to incorporate the suggested modifications into Ch. 2 on p. 11 or 12, as opposed to Ch. 3, p. 27, as suggested by the reviewers. Second, it is stated in the suggested modifications that where the techniques described in Ch. 2 for assessing probabilities are inadequate, "expert judgment" would be appropriate. Actually, one of the techniques described in Ch. 2 is expert judgment. Third, the terms "relative" and "absolute" probabilities are not recognized terms in the field of probability. To introduce new terminology in a report such as this one might lead to confusion among people in the fields of probability and risk analysis. Further, the normalization process discussed in the report must be carried out on all probabilities assigned to the final set of scenarios, not just the so-called "relative" probabilities. Finally, the statement that "...a relative probability of 2 indicates only that a particular event is estimated to be twice as likely as another with a relative probability of 1" is confusing. If an event has a probability of 1 of occurring, then another event cannot be twice as likely

to occur, because an assignment of probability 1 to an event means that it will occur. Possibly what the reviewers meant to say was that if an event, A, is twice as likely to occur as another event, B, then the probability of event A would be twice that of event B, where both numbers must be between 0 and 1.

R. M. Cranwell is writing up additional information on the normalization process. We think it would be advisable to meet with NRC staff to discuss this topic further, because there seems to be concern at NRC about the subject. We will contact S. Wastler about a meeting date as soon as the new material is finished.

A-1165, Task I  
 1183.010  
 April 1986

THIS IS AN ESTIMATE ONLY AND MAY NOT MATCH THE INVOICES SENT TO  
 NRC BY SANDIA'S ACCOUNTING DEPARTMENT.

	Current Month	Year-to-Date
I. Direct Manpower (man-months of charged effort)	1.0	1.8
II. Direct Loaded Labor Costs	11.0	20.0
Materials and Services	0.0	0.0
ADP Support (computer)	0.0	0.0
Subcontracts*	2.0	27.0
Travel	0.0	2.0
Other	0.0	0.0
TOTAL COSTS	13.0	49.0

Other = rounding approximation  
 by computer

### III. Funding Status

Prior FY Carryover	FY86 Projected Funding Level	FY86 Funds Received to Date	FY86 Funding Balance Needed
50K	200K	150K	None

\* Charges were received for Remote Sensing.

A-1165, Task II  
1183.020  
April 1986

THIS IS AN ESTIMATE ONLY AND MAY NOT MATCH THE INVOICES SENT TO  
NRC BY SANDIA'S ACCOUNTING DEPARTMENT.

	Current Month	Year-to-Date
I. Direct Manpower (man-months of charged effort)	0.1	0.2
II. Direct Loaded Labor Costs	1.0	2.0
Materials and Services	0.0	0.0
ADP Support (computer)	0.0	0.0
Subcontracts*	7.0	25.0
Travel	0.0	0.0
Other	<u>-1.0</u>	<u>-1.0</u>
TOTAL COSTS	7.0	26.0

Other = rounding approximation  
by computer

### III. Funding Status

Prior FY Carryover	FY86 Projected Funding Level	FY86 Funds Received to Date	FY86 Funding Balance Needed
-0-	80K	80K	None

\* Charges were accrued for SAI against EA and SCP reviews.

A-1165, Task III  
 1183.030  
 April 1986

THIS IS AN ESTIMATE ONLY AND MAY NOT MATCH THE INVOICES SENT TO  
 NRC BY SANDIA'S ACCOUNTING DEPARTMENT.

	Current Month	Year-to-Date
I. Direct Manpower (man-months of charged effort)	0.0	4.3
II. Direct Loaded Labor Costs	0.0	46.0
Materials and Services	0.0	0.0
ADP Support (computer)	0.0	0.0
Subcontracts*	12.0	67.0
Travel	0.0	1.0
Other	0.0	0.0
TOTAL COSTS	12.0	114.0

Other = rounding approximation  
 by computer

### III. Funding Status

Prior FY Carryover	FY86 Projected Funding Level	FY86 Funds Received to Date	FY86 Funding Balance Needed
143K	163K	20	None

\*Charges were received for Cornell, Holland, and Einstein.

A-1165, Task IV  
1183.040  
April 1986

THIS IS AN ESTIMATE ONLY AND MAY NOT MATCH THE INVOICES SENT TO  
NRC BY SANDIA'S ACCOUNTING DEPARTMENT.

	Current Month	Year-to-Date
I. Direct Manpower (man-months of charged effort)	0.0	2.9
II. Direct Loaded Labor Costs	0.0	35.0
Materials and Services	0.0	1.0
ADP Support (computer)	0.0	0.0
Subcontracts	0.0	1.0
Travel	0.0	3.0
Other	0.0	0.0
TOTAL COSTS	0.0	40.0

Other = rounding approximation  
by computer

### III. Funding Status

Prior FY Carryover	FY86 Projected Funding Level	FY86 Funds Received to Date	FY86 Funding Balance Needed
-0-	50K	50K	None

A-1165

TOTAL FOR 1183.010, 1183.020, 1183.030, 1183.040

April 1986

THIS IS AN ESTIMATE ONLY AND MAY NOT MATCH THE INVOICES SENT TO  
NRC BY SANDIA'S ACCOUNTING DEPARTMENT.

	Current Month	Year-to-Date
I. Direct Manpower (man-months of charged effort)	1.1	9.2
II. Direct Loaded Labor Costs	12.0	103.0
Materials and Services	0.0	1.0
ADP Support (computer)	0.0	0.0
Subcontracts	21.0	120.0
Travel	0.0	6.0
Other	<u>-1.0</u>	<u>-1.0</u>
TOTAL COSTS	32.0	229.0

Other = rounding approximation  
by computer

III. Funding Status

Prior FY Carryover	FY86 Projected Funding Level	FY86 Funds Received to Date	FY86 Funding Balance Needed
193K	493K	300K	None