

**Sandia National Laboratories**

Albuquerque, New Mexico 87185

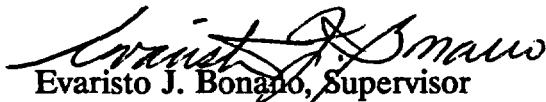
April 15, 1991

Mr. David H. Tiktinsky  
Office of Nuclear Material Safety  
and Safeguards  
Division of High-Level Waste Management  
U.S. Nuclear Regulatory Commission  
Mail Stop 6A-4  
Washington, DC 20555

Dear Mr. Tiktinsky:

Enclosed is the March 1991 monthly report for FIN A1165. If you have any questions or comments, please feel free to contact me at (FTS) 844-5303 or L. L. Price at (FTS) 844-6206.

Sincerely,



Evaristo J. Bonano, Supervisor  
Waste Management Systems  
Division 6416

EJB:6416

Enclosure

Copy to:

E. Davis  
Office of the Director, NMSS  
Attn: Program Support  
Robert Browning, Director  
Division of High-Level Waste Management  
Seth Coplan  
Division of High-Level Waste Management  
Pauline Brooks  
Division of High-Level Waste Management  
John Randall  
Division of Engineering

1/1

9104170096 910415  
PDR WMRES EXISANL  
A-1165 PDR

A-1165 Wm-11  
NH14

3223 P. A. Davis  
3223 M. T. Goodrich  
6410 D. A. Dahlgren  
6416 E. J. Bonano  
6416 N. E. Olague  
6416 L. L. Price  
6416 K. K. Wahi  
6416 D. A. Zimmerman  
6416 1183.000 File

**SUMMARY SHEET**

**March 1991 Monthly Report for FIN A1165**

<b><u>Task</u></b>	<b><u>Activity</u></b>	<b><u>Costs</u></b>
I	Licensing Methodology Assistance	\$ 0K
II	Uncertainty Identification and Analysis	\$ 0K
III	Probability Techniques	\$ 0K
IV	Maintenance and Management of PA Codes	\$ 0K
V	Technical Assistance for SCP Review	\$ 0K
VI	Short Term Technical Assistance	\$ 0K

**PROGRAM: Licensing Methodology Assistance**

**FIN A1165  
Task I**

**CONTRACTOR: Sandia National Laboratories**

**BUDGET PERIOD: 10/90 - 9/91**

**NMSS PROGRAM MANAGER: P. Brooks**

**BUDGET AMOUNT: \$0K**

**CONTRACT PROGRAM MANAGER: E. J. Bonano**

**FTS PHONE: 844-5303**

**PRINCIPAL INVESTIGATOR: L. L. Price**

**FTS PHONE: 844-6206**

**PROJECT OBJECTIVE**

**To assist in the overall development and integration of the licensing assessment methodology.**

**ACTIVITIES DURING MARCH 1991**

**Task I has been completed.**

**PROGRAM: Identification and Analysis of Uncertainties**

**FIN A1165  
Task II**

**CONTRACTOR: Sandia National Laboratories**

**BUDGET PERIOD: 10/90 - 9/91**

**NMSS PROGRAM MANAGER: P. Brooks**

**BUDGET AMOUNT: \$0K**

**CONTRACT PROGRAM MANAGER: E. J. Bonano**

**FTS PHONE: 844-5303**

**PRINCIPAL INVESTIGATOR: L. L. Price**

**FTS PHONE: 844-6206**

### **PROJECT OBJECTIVE**

**To identify, analyze, and recommend generic methodologies for treating uncertainties associated with performance assessments of HLW repositories.**

### **ACTIVITIES DURING MARCH 1991**

#### **Subtask 2.1**

- I. Recommended techniques for assessing compliance with the EPA's HLW repository containment requirement (40 CFR 191.13)**

**Completed.**

#### **Subtask 2.2/2.6c**

- I. Identification, evaluation, quantification, and reduction of uncertainty in HLW repository performance assessments.**

**Completed.**

#### **Subtask 2.3**

- I. Elicitation and use of expert judgement in dealing with uncertainty in HLW repository performance assessments.**

**Completed.**

#### **Subtask 2.4**

##### **I. Methods for analyzing uncertainty in HLW repository performance assessment models.**

**A camera-ready copy of this report was sent to the NRC on March 7, 1991. This fulfills SNL's obligation with respect to Subtask 2.4**

#### **Subtask 2.5**

##### **I. A methodology for scenario development and screening.**

**Completed**

#### **Subtask 2.6**

##### **I. Recommended methodologies for the analysis of data and parameter uncertainty in HLW repository performance assessment.**

**Completed**

##### **IV. Uncertainty and sensitivity analysis in ground-water flow modeling.**

**Editorial corrections to this report were made and it is continuing in the management sign-off process. We have received verbal notification that the report has been approved by the USGS, although we have not received written approval.**

**PROGRAM: Probability Techniques**

**FIN A1165  
Task III**

**CONTRACTOR: Sandia National Laboratories**

**BUDGET PERIOD: 10/90 - 9/91**

**NMSS PROGRAM MANAGER: P. Brooks**

**BUDGET AMOUNT: \$0K**

**CONTRACT PROGRAM MANAGER: E. J. Bonano**

**FTS PHONE: 844-5303**

**PRINCIPAL INVESTIGATOR: L. L. Price**

**FTS PHONE: 844-6206**

### **PROJECT OBJECTIVE**

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

### **ACTIVITIES DURING JANUARY 1991**

#### **Subtask 3.2**

- I. Recommended techniques for estimating probabilities of events and processes affecting the performance of geologic repositories; assessing compliance with the EPA's containment requirements (40 CFR 191.13).**

**The report is currently in the management sign-off process. We are waiting for responses to requests for copyright permission from four publishers.**

**PROGRAM: Short-Term Technical Assistance**

**FIN A1165  
Task VI**

**CONTRACTOR: Sandia National Laboratories**

**BUDGET PERIOD: 10/90 - 9/91**

**NMSS PROGRAM MANAGER: P. Brooks**

**BUDGET AMOUNT: \$0K**

**CONTRACT PROGRAM MANAGER: E. J. Bonano**

**FTS PHONE: 844-5303**

**PRINCIPAL INVESTIGATOR: L. L. Price**

**FTS PHONE: 844-6206**

**PROJECT OBJECTIVE**

**To provide, on short notice, general technical assistance on HLW matters related to Tasks 1 through 5 that would not be provided in the normal course of the work in these tasks.**

**ACTIVITIES DURING MARCH 1991**

**No activity this month**



FIN A1165  
 Total for Case 1183.000  
 March 1991

**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 —	0 —
II. Direct Loaded Labor Costs	0	0
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	0	0
Travel	0	0
General and Administrative	0	0
Other (computer round-off)	0	0
<b>TOTAL COSTS</b>	<b>0</b>	<b>0</b>

**III. Funding Status**

Prior FY Carryover -----	FY 90 Projected Funding Level -----	FY 90 Funds Received to Date -----	FY 90 Funding Balance Needed -----
\$ 0K	\$ 0K	\$ 0K	None

FIN A1165, Task I - Licensing Methodology Assistance  
 Subcase 1183.010  
 March 1991

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	0
	—	—
II. Direct Loaded Labor Costs	0	0
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	0	0
Travel	0	0
General and Administrative	0	0
Other (computer round-off)	0	0
	—	—
TOTAL COSTS	0	0

III. Funding Status

Prior FY Carryover	FY 91 Projected Funding Level	FY 91 Funds Received to Date	FY 91 Funding Balance Needed
-----	-----	-----	-----
\$ 0K	\$ 0K	\$ 0K	None

FIN A1165, Task II - Identification and Analysis of Uncertainties  
 Subcase 1183.020  
 March 1991

**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 —	0 —
II. Direct Loaded Labor Costs	0	0
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	0	0
Travel	0	0
General and Administrative	0	0
Other (computer round-off)	0	0
<b>TOTAL COSTS</b>	<b>0</b>	<b>0</b>

III. Funding Status

Prior FY Carryover -----	FY 91 Projected Funding Level -----	FY 91 Funds Received to Date -----	FY 91 Funding Balance Needed -----
\$ 0K	\$ 0K	\$ 0K	None

FIN A1165, Task III - Probability Techniques  
 Subcase 1183.030  
 March 1991

**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 —	0 —
II. Direct Loaded Labor Costs	0	0
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	0	0
Travel	0	0
General and Administrative	0	0
Other (computer round-off)	0	0
<b>TOTAL COSTS</b>	<u>0</u>	<u>0</u>

**III. Funding Status**

Prior FY Carryover -----	FY 90 Projected Funding Level -----	FY 90 Funds Received to Date -----	FY 90 Funding Balance Needed -----
\$ 0K	\$ 0K	\$ 0K	None

FIN A1165, Task VI  
 Subcase 1183.060  
 March 1991

**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 —	0.0 —
II. Direct Loaded Labor Costs	0	0
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	0	0
Travel	0	0
General and Administrative	0	0
Other (computer round-off)	0	0
<b>TOTAL COSTS</b>	<u>0</u>	<u>0</u>

**III. Funding Status**

Prior FY Carryover -----	FY 90 Projected Funding Level -----	FY 90 Funds Received to Date -----	FY 90 Funding Balance Needed -----
\$ 0K	\$ 0K	\$ 0K	None

**Deliverables and Due Dates  
FIN A1165**

**Task 1**

**Subtask 1.1 - Components of an Overall Performance Assessment Methodology**

**Submitted - 1/31/90      Status - Completed**

**Subtask 1.3e - Technical Basis for Review of HLW Modeling Programs  
(Includes Subtasks 1.3b, 1.3c, and 1.3d)**

**Submitted - 2/8/90      Status - Completed**

**Task 2**

**Subtask 2.1 - Recommended Techniques for Assessing Compliance with the EPA's HLW  
Repository Containment Requirement**

**Submitted - 8/27/90      Status - Completed**

**Subtask 2.2/2.6c - Uncertainties Associated with Performance Assessment of High-Level  
Radioactive Waste Repositories: A Summary Report**

**Submitted - 10/31/90      Status - Completed**

**Subtask 2.3 - Elicitation and Use of Expert Judgment in HLW PA (Includes a portion of  
subtask 2.6e)**

**Submitted - 3/23/90      Status - Completed**

**Subtask 2.4a - Treating Uncertainties in PA Models**

**Submitted - 3/7/91      Status - Completed**

**\* - All costs are as of September 1, 1990**

**\*\* - Lead individual for a given report is in bold letters**

**Subtask 2.5a - Scenario Development Methodology**

**Submitted - 3/26/90**

**Status - Completed**

**Subtask 2.6a - Methodologies for Data and Parameter Uncertainty**

**Submitted - 2/15/90**

**Status - Completed**

**Subtask 2.6d - Comparison of Uncertainty and Sensitivity Analysis Techniques  
(Includes Subtask 2.6e)**

**Submitted - 2/27/90**

**Estimated Cost - \$0K**

**Key Individuals - T. Zimmerman**

**Status - In management signoff**

**Task 3**

**Subtask 3.2 - Estimating Probabilities for Initiating Events and Processes**

**Submitted - 2/21/90**

**Estimated Cost - \$0K**

**Key Individuals - G. Apostolakis, R. Bras  
L. Price, K. Wahi**

**Status - In management signoff**

**Task 6**

**Short Term Technical Assistance**

**Funds Remaining - \$0K**

**DELIVERABLES SUBMITTED DURING THE CURRENT REPORTING PERIOD**

<u>Subtask Number</u>	<u>Deliverable Title</u>	<u>Date</u>	<u>Status</u>
2.4a	Approaches for the Validation of Models Used for Performance Assessment of High-Level Nuclear Waste Repositories, NUREG/CR-5537, SAND90-0575.	March 7, 1991	Completed



## SCHEDULE OF MILESTONES AND DELIVERABLES

<u>Subtask Number</u>	<u>Deliverable Title</u>	<u>Draft Due</u>	<u>Final Due</u>	<u>STATUS</u>
1.1	Components of an Overall Performance Assessment Methodology	Submitted December 1, 1988	Submitted January 31, 1990	Completed
1.3e	Technical Basis for NRC Review of HLW Repository Modeling	Submitted June 14, 1989	Submitted February 8, 1990	Completed
2.1	Use of Performance Assessment in Assessing Compliance with the Containment Requirements in 40 CFR Part 191	Submitted January 16, 1990	Submitted August 27, 1990	Completed
2.2/2.6c	Uncertainties Associated with Performance Assessment of High-level Radioactive Waste Repositories: A Summary Report	Submitted April 2, 1990	Submitted October 31, 1990	Completed
2.3	Elicitation and Use of Expert Judgment in Performance Assessment for High-Level Waste Repositories	Submitted July 26, 1990	Submitted April 23, 1990	Completed
2.4a	Approaches for the Validation of Models Used for Performance Assessment of High-Level Nuclear Waste Repositories	Submitted February 7, 1990	Submitted March 7, 1991	Completed

2.5	<b>Risk Methodology for Geologic Disposal of Radioactive Waste: Scenario Selection Procedure</b>	<b>Submitted June 27, 1989</b>	<b>Submitted March 26, 1990</b>	<b>Completed</b>
2.6a	<b>A Review of Techniques for Propagating Data and Parameter Uncertainties in High-Level Radioactive Waste Repository Performance Assessment Models</b>	<b>Submitted May 31, 1989</b>	<b>Submitted February 15, 1990</b>	<b>Completed</b>
2.6d	<b>A Comparison of Parameter Estimation and Sensitivity Analysis Techniques for Ground-Water Flow Models and Their Impact on the Uncertainty in Model Performance Predictions</b>	<b>Submitted February 27, 1990</b>	<b>May 15, 1991</b>	<b>In management signoff.</b>
3.2	<b>Techniques for Determining Probabilities of Events and Processes Affecting the Performance of Geologic Repositories: Volume II –Suggested Approaches</b>	<b>Submitted February 21, 1990</b>	<b>March 31, 1991</b>	<b>In management signoff.</b>