Sandia National Laboratories

Albuquerque, New Mexico 87185

September 12, 1988

Mr. Chad Glenn
Regulatory Branch
Division of Low-Level Waste Management
and Decommissioning
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop 5E4
Washington, DC 20555

Dear Mr. Glenn:

Enclosed is the September 1988 monthly report for FIN A1763. If you have any questions or comments, please feel free to contact me at (FTS) 844-8368 or Billy O'Neal at (FTS) 844-3194.

Sincerely,

Robert M. Cranwell

Robert M. Cranwell
Safety and Reliability Analysis
Division 6415

RMC:6416:om

Enclosure

Copy to:
USNRC Office of Director, NMSS (Attn: PMDA)
USNRC Dr. M. R. Knapp, Director, DLLWMB
USNRC C.E. MacDonald, NMSS/TB
USNRC LLWM Docket Control Center
6410 N. R. Ortiz
6415 R. M. Cranwell
6415 B. L. O'Neal

Program: Evaluation, Validation, Verification, and Documentation of the IMPACTS-BRC Computer Code. FIN: A1763

Contractor: Sandia National Laboratories BUDGET PERIOD: 10/87 -9/88

NRC PROGRAM MANAGER C. J. Glenn BUDGET AMOUNT: $150K

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

PRINCIPAL INVESTIGATOR: B. L. O'Neal FTS PHONE: 844-3194

PROJECT OBJECTIVES

To validate, verify, document and make code changes as necessary so as to provide the NRC with a documented and defensible version of IMPACTS-BRC for subsequent use in BRC petitions.

ACTIVITIES DURING SEPTEMBER 1988

The activities during September primarily focused on the Task 2 code verification assignments. Some effort was required by the principal investigator, Billy O'Neal to become familiar with IMPACTS-BRC methodology and the future project task assignments.

The following activities were completed:

(1) A quality assurance procedure was developed to document all verification activities and to assure proper operation and function of the code during all task assignments. The verification assurance procedures requires that each subroutine be verified independently from the other subroutines in order to assure the absence of any side effects.

(2) An overview of the code was conducted to evaluate the code structure, subroutine functions and subroutine hierarchy. The overview revealed that the code contained many comment statements relating to previous code modifications but is considerably lacking in comment statements to explain logic steps, variables, and mathematical expressions.

(3) Verification activities (logic paths, flow diagrams, mathematical expressions, mathematical calculations, etc.) have been completed on 7 of the 20 subroutines in the code. Currently, no problems have been detected.

(4) Some progress has been made in the Task 3 validation assignment. The subroutines EXPWAS and INTIMP calculate post-disposal impacts that include daughter radionuclide contribution for 10 specific nuclides. The decay chain values calculated by the subroutines CHANS, CALE, and CALI have been benchmarked using RADDECAY, a PC program within Microshield. The fundamental dose conversion factor values for ingestion (Table D-6, DCF1) have been compared to values calculated using a PC program called REMedy and values listed in the DOE Report "Committed Dose Equivalent Tables for U.S. Department of Energy Population Dose Calculations". The values from REMedy and the DOE report compared very well. Most IMPACT-BRC comparisons were within +/- 20 percent of the REMedy/DOE values. However, a few values differed by a factor of 3. Dose conversion values for inhalation will be similarly compared. Results will be detailed in the validation task assignment.

(5) The Task 1 Technical Letter Report was submitted for review and comments. When comments are received, they will be responded to and, where appropriate incorporated into a final Task 1 Technical Letter. Comments will probably not affect the current task assignment but may affect future task assignments.

(6) An executable version of IMPACTS-BRC was tested and mailed to NRC for operational testing. Included was a Readme File with operation instructions and comments on using the code.

The current task assignments (code verification) and future task assignments (code validation, code revision) required that we purchase a personal computer. An IBM PS/2 with a VGA color monitor was purchased at a cost of approximately $5K. The computer is expected to be received by late October 1988. The computer was purchased under FIN A1763 and is recognized to be the property of the Regulatory Branch, Division of Low-Level Waste Management and Decommissioning, Office of NMSS. The computer will be returned upon request at the end of the project.

FIN A1763
Subcase 2069.010
September 1988

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)	0.6	3.1
II.	Direct Loaded Labor Costs	5.0	31.0
	Materials and Services	0.0	0.0
	ADP Support (computer)	0.0	0.0
	Purchases	14.0	58.0
	Travel	1.0	2.0
	G&A Load	2.0	9.0
	Other (includes computer roundoff)	-1.0	-1.0
	TOTAL COSTS	21.0	99.0

III. Funding Status

Prior FY Carryover	FY 88 Projected Funding Level	FY 88 Funds Received to Date	FY 88 Funding Balance Needed
-0-	$150K	$150K	-0-