

A1158

PDR-1
LPDR- Wm-10 (2)
Wm-11 (2)
Wm-16 (2)

Sandia National Laboratories
Albuquerque, New Mexico 87185

WM DOCKET CONTROL
CENTER

July 15, 1987

'87 JUL 16 11:56

Neil M. Coleman
Hydrology Section
Geotechnical Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
7915 Eastern Avenue
Silver Spring, MD 20910

Dear Mr. Coleman:

Enclosed is the monthly report on FIN A-1158, Repository Site Definition and Technology Transfer for June 1987. Please feel free to contact me at FTS 844-8368 or Charlene Harlan at FTS 844-8164 if you have any questions or comments.

Sincerely,

Robert M. Cranwell

Robert M. Cranwell, Supervisor
Waste Management Systems
Division 6416

RMC:6416

Enclosures

- Copy to:
- Office of the Director, NMSS
 - Attn: Program Support
 - Robert Browning, Director
 - Division of Waste Management
 - Philip Justus
 - Division of Waste Management
 - Ronald L. Ballard, Branch Chief
 - Division of High-Waste Management
 - John Randall
 - Division of Radiation Programs and Earth Sciences
 - 6400 R. C. Cochrell
 - 6410 N. R. Ortiz
 - 6416 R. M. Cranwell
 - 6416 P. A. Davis
 - 6416 C. P. Harlan
 - 6416 G. F. Wilkinson

Wm-RES
WM Record File
A1158
SNL

WM Project 10, 11, 16
Docket No. _____
PDR ✓
LPDR ✓ (B, N, S)

87222712	H
WM Project: WM-10,11,16	WM Record File: A1158
PDR w/encl	LPDR w/encl
(Return to WM, 623-SS)	

Distribution:	
<u>Coleman</u>	<u>Joan-ticket</u>
(Return to WM, 623-SS)	<u>Sac</u>

8709080281 870715
PDR WMRES EXISANL
A-1158 PDR

3935

MANAGEMENT ISSUES:

During June 1987, the 189 was completed and transmitted to the NRC.

PROGRAM: Task I, Repository Site Definitions

FIN#: A-1158

CONTRACTOR: Sandia National Laboratories

BUDGET PERIOD: 10/86 -
9/87

NMSS PROGRAM MANAGER: N. M. Coleman

BUDGET AMOUNT: - 0 -

CONTRACT PROGRAM MANAGER: R. M. Cranwell

FTS PHONE: 844-8368

PRINCIPAL INVESTIGATOR: C. P. Harlan

FTS PHONE: 844-8164

PROJECT OBJECTIVE

To develop RSDs for candidate host media and provide data for use in developing and testing performance assessment methodologies for the various media.

ACTIVITIES DURING JUNE 1987

No activity.

PROGRAM: Task II, Technology Transfer

FIN#: A-1158

CONTRACTOR: Sandia National Laboratories

BUDGET PERIOD: 10/86 -
9/87

NMSS PROGRAM MANAGER: N. M. Coleman

BUDGET AMOUNT: \$150K

CONTRACT PROGRAM MANAGER: R. M. Cranwell

FTS PHONE: 844-8368

PRINCIPAL INVESTIGATOR: C. P. Harlan

FTS PHONE: 844-8164

PROJECT OBJECTIVE

To provide technical support for the transfer of the capability to use the information, analytical techniques, and tools developed for the NRC under the Performance Assessment Methodology program (FIN A-1266).

ACTIVITIES DURING JUNE 1987

During June the NEFTRAN User's Manual, NUREG/CR-4766, was completed and placed in Sandia's management sign-off. Once the sign-off is complete and any comments addressed, camera-ready copies will be sent to Sandia's Publications organization for printing. The final documents will then be forwarded to the NRC for distribution.

The TOUGH User's Manual, NUREG/CR-4645 completed Sandia management sign-off June 9. A copy of the final draft was transmitted to the A1158 PM 06/22/1987 and the camera-ready copies and associated materials transmitted to the NRC Publications organization.

PROGRAM: Task III, Maintenance of Computer Codes

FIN#: A-1158

CONTRACTOR: Sandia National Laboratories

BUDGET PERIOD: 10/86 -
9/87

NMSS PROGRAM MANAGER: N. M. Coleman

BUDGET AMOUNT: \$174K

CONTRACT PROGRAM MANAGER: R. M. Cranwell

FTS PHONE: 844-8368

PRINCIPAL INVESTIGATOR: C. P. Harlan

FTS PHONE: 844-8164

PROJECT OBJECTIVE

To implement a quality assurance program to maintain computer codes, report errors, document changes, and inform the NRC staff.

ACTIVITIES DURING JUNE 1987

During June three codes were Qa'd on the INEL computer system - TOUGH, STEPWISE and PATH1. Enclosed is the current on-line menu for user help. This menu now contains nine codes. Also included is the additional on-line documentation for these new codes, and a current directory of files stored in the CRH user area at INEL.

The A1266 PM requested that the Sandia Principle Investigator for that project provide the NRC with SWIFT II and its associated materials in preparation for installation of the code at the National Energy Software Center (NESC). SWIFT II and two of the three manuals were developed under A1266. This information is only meant to be informative since A1158 was not costed for this effort.

PROGRAM: Task IV, Code Validation and Verification FIN#: A-1158

CONTRACTOR: Sandia National Laboratories BUDGET PERIOD: 10/86 - 9/87

NMSS PROGRAM MANAGER: N. M. Coleman BUDGET AMOUNT: \$50K

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

PRINCIPAL INVESTIGATOR: C. P. Harlan FTS PHONE: 844-8164

PROJECT OBJECTIVE

To assemble the various tests that have been performed to help validate and verify various portions of relevant codes and recommend any additional feasible tests.

ACTIVITIES DURING JUNE 1987

No activity.

PROGRAM: Task V, Short-term Technical Assistance

FIN#: A-1158

CONTRACTOR: Sandia National Laboratories

BUDGET PERIOD: 10/86 -
9/87

NMSS PROGRAM MANAGER: N. M. Coleman

BUDGET AMOUNT: \$20K

CONTRACT PROGRAM MANAGER: R. M. Cranwell

FTS PHONE: 844-8368

PRINCIPAL INVESTIGATOR: C. P. Harlan

FTS PHONE: 844-8164

PROJECT OBJECTIVE

To provide general technical assistance on waste management matters relating to Tasks I, II, III, IV, and VI

ACTIVITIES DURING JUNE 1987

No activity.

PROGRAM: Task VI, T. A. in Numerical Modeling

FIN#: A-1158

CONTRACTOR: Sandia National Laboratories

BUDGET PERIOD: 10/86 -
9/87

NMSS PROGRAM MANAGER: N. M. Coleman

BUDGET AMOUNT: \$70K

CONTRACT PROGRAM MANAGER: R. M. Cranwell

FTS PHONE: 844-8368

PRINCIPAL INVESTIGATOR: C. P. Harlan

FTS PHONE: 844-8164

PROJECT OBJECTIVE

Provide expert opinion input to NRC reviews of DOE site screening, site characterization, and technical development programs. Work includes numerical modeling assessments and participation in technical meetings, site visits and workshops.

ACTIVITIES DURING JUNE 1987

During June research began on the basis for 10CFR60 Part 113, the ground-water travel time rule.

June 30, 1987, P. A. Davis met with the A1158 PM in Washington, DC, to discuss the program progress.

All editorial comments have been incorporated in the report "Numerical Modeling of Ground-Water Flow Systems in the Vicinity of the Reference Repository Location, Hanford Site, Washington". Final figures for the report have not yet been returned from Tech Reps, the contractor providing camera-ready figures for the report. P. A. Davis will hand-carry a copy of the report to the PM mid-July.

/GET,QUAHELP/UN=CRH
/BEGIN,,QUAHELP

MENU FOR QUALIB DOCUMENTATION:

- | | |
|--------------|--------------|
| 1 - SWIFT II | 6 - USGS |
| 2 - NWFTDVM | 7 - PATH1 |
| 3 - GENNET | 8 - STEPWISE |
| 4 - DNET | 9 - TOUGH |
| 5 - LHS | |

10 - EXIT MENU

(SELECT A NUMBER AND PRESS RETURN)

?

TOUGH (TRANSPORT OF UNSATURATED GROUNDWATER AND HEAT) WAS DEVELOPED AT LAWRENCE BERKELEY LABORATORY BY KARSTEN PRUESS. THE TOUGH USER'S GUIDE WAS DEVELOPED FOR THE NUCLEAR REGULATORY COMMISSION (NUREG/CR-4645) UNDER DIRECTION OF SANDIA NATIONAL LABORATORIES (SAND86-7104) BY KARSTEN PRUESS (LBL-20700).

TOUGH FILES:

TOUGH - CDC FORTRAN 77 COMPILE FILE
TOUGHB - BINARIES FOR THE CDC VERSION
TOUGH01 - USER'S GUIDE SAMPLE PROBLEM 1
TOUGH02 - USER'S GUIDE SAMPLE PROBLEM 2
TOUGH03 - USER'S GUIDE SAMPLE PROBLEM 3
TOUGH04 - USER'S GUIDE SAMPLE PROBLEM 4
TOUGH05 - USER'S GUIDE SAMPLE PROBLEM 5 (LARGE RUN TIME)
TOUGH06 - USER'S GUIDE SAMPLE PROBLEM 6 (LARGE RUN TIME)
TOUGDOC - FILE CONTAINING DOCUMENTATION ON TOUGH CODE

EXAMPLE INTERACTIVE SESSION USING SAMPLE PROBLEM 1:

GET,TOUGH01/UN=CRH
GET,TOUGHB/UN=CRH
RFL,0,1000
LDSET,PRESET=0
TOUGHB,TOUGH01,TOUT

(EXECUTION IN PROGRESS)

RFL,0
(TOUT IS YOUR OUTPUT FILE)
(NOTE: 5 ADDITIONAL RESTART FILES ARE CREATED - INCON, SAVE, LINEQ, MESH, AND GENER. YOU MUST PURGE THESE FILES IF A SUBSEQUENT RUN IS NOT A RESTART)

PROCEDURE TO GET A HARDCOPY OF THIS DOCUMENTATION:

GET,TOUGDOC/UN=CRH
(SEND THIS FILE TO YOUR PRINTER)

STEPWISE INTERNAL DOCUMENTATION:

```
*****  
* CODE NAME - STEPWISE *  
* * * * *  
* VERSION - 1980 FORTRAN IV (CDC 7600) *  
* - 1985 FORTRAN 77 (VAX VERSION) *  
* - CONVERTED FROM VAX TO CDC CYBER 180/855 *  
* FEBRUARY 1987 (IDENTIFIER IS FEB87) *  
* * * * *  
* DESCRIPTION - STEPWISE PROVIDES FOR EITHER A FORWARD *  
* STEPWISE OR BACKWARD ELIMINATION SOLUTION *  
* TO MULTIPLE REGRESSION PROBLEMS. IT ALSO *  
* PROVIDES PRESS VALUES THAT CAN BE USED FOR *  
* SUBSET SELECTION AS WELL AS PROVIDING OP- *  
* TIONS FOR REGRESSION ANALYSIS ON THE RANKS *  
* OF THE DATA AND FOR A WEIGHTED REGRESSION *  
* ANALYSIS ON EITHER RAW OR RANK TRANSFORMED *  
* DATA. *  
* * * * *  
* LANGUAGE - ANSI STANDARD FORTRAN V *  
* * * * *  
* HARDWARE - CDC CYBER 180/855 MACHINES *  
* * * * *  
* DOCUMENTATION - STEPWISE USER'S MANUAL, SAND79-1472 *  
* * * * *  
* SANDIA CONTACTS - LARRY R. SHIPERS *  
* CHARLENE P. HARLAN *  
* GINGER F. WILKINSON *  
* * * * *  
*****
```

STEPWISE FILES:

```
STEPCMP - STEPWISE COMPILE FILE  
STEPLGO - STEPWISE COMPILED BINARIES  
STEP01 - STEPWISE SAMPLE PROBLEM 1 INPUT  
STEPDOC - FILE CONTAINING DOCUMENTATION ON STEPWISE
```

STEPWISE EXECUTION PROCEDURE:

```
(EXAMPLE USING STEP01)  
GET,STEPLGO/UN=CRH (GET THE EXECUTABLE BINARIES)  
GET,TAPE5=STEP01/UN=CRH (SELECT STEP01 AS INPUT FILE)  
RFL,0,400 (REQUEST EXTENDED MEMORY)  
STEPLGO,TAPE5,TAPE6 (EXECUTE JOB)  
.  
.  
.  
.  
.  
.  
.  
RFL,0 (RELEASE EXTENDED MEMORY)  
RETURN,*,TAPE6 (RELEASE ALL FILES EXCEPT OUTPUT TAPE6)
```

PROCEDURE TO GET A HARDCOPY OF THIS DOCUMENTATION:

```
GET,STEPDOC/UN=CRH  
(SEND THIS FILE TO YOUR PRINTER)
```


/DIR

UN=CRH

UI=3114 FAMILY=INEL 87/06/22. 16.08.23.

*A42292	DNETCMP	DNETDOC	DNETLGO	DNET01	DNET02	DNET03
DNET04	DNET05	FLECSLG	GENCMP	GENDOC	GENLGO	GEN01
GEN02	GEN03	GEN04	*LHSCMP	LHSDOC	LHSLGO	LHS01
LHS02	NWFTCMP	NWFTDOC	NWFTLGO	NWFT01	NWFT02	NWFT03
NWFT04	PATHCMP	PATHDOC	PATHLGO	PATH01	PATH02	PATH03
PATH04	PATH05	PATH06	QUAHELB	QUAHELP	QUAHEL5	STEP01
STEPDOC	STEPLGO	STEP01	*SWIFTII	*SWIICMP	SWIIDIB	SWIIDIM
SWIIDOC	*SWIILGO	SWII01	SWII02	SWII03	SWII04	SWII05
SWII06	SWII07	SWII08	TOUGDOC	TOUGH	TOUGHB	TOUGH01
TOUGH02	TOUGH03	TOUGH04	TOUGH05	TOUGH06	*USGS	USGSDOC
USGSLGO	USGSUPD	USGS01	USGS02	USGS03	USGS04	OBIN

71	IND.	5885	PRUS.	5885	ALLOCATED.	\$3.21+/DAY.
6	(*)DIR.	7315	PRUS.	9600	ALLOCATED.	\$6.34+/DAY.

A-1158, Task I, Repository Site Definition
 0976.010
 JUNE 1987

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
Other (computer roundoff)	0	0
G & A	0	0
TOTAL COSTS	0 ---	0 ---

III. Funding Status

Prior FY Carryover -----	FY 87 Projected Funding Level -----	FY 87 Funds Received to Date -----	FY 87 Funding Balance Needed -----
\$ OK	\$ OK	\$ OK	\$ OK

A-1158, Task II, Technology Transfer
 0976.020
 JUNE 1987

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)	0.4 ---	3.9 ---
II. Direct Loaded Labor Costs	3	31
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	0	109
Travel	0	0
Other (computer roundoff)	0	2
G & A	0	-5
	-----	-----
TOTAL COSTS	3	137

III. Funding Status

Prior FY Carryover -----	FY 87 Projected Funding Level -----	FY 87 Funds Received to Date -----	FY 87 Funding Balance Needed -----
\$ 46K	\$150K	\$104K	\$ 0K

A-1158, Task III, Maintenance of Computer Codes
 0976.030
 JUNE 1987

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)	0.5	7.8
II. Direct Loaded Labor Costs	4	61
Materials and Services	0	0
ADP Support (computer)	1	11
Subcontracts	0	31
Travel	0	0
Other (computer roundoff)	0	0
G & A	0	13
TOTAL COSTS	5	116

III. Funding Status

Prior FY Carryover -----	FY 87 Projected Funding Level -----	FY 87 Funds Received to Date -----	FY 87 Funding Balance Needed -----
\$108K	\$174K	\$ 66K	\$ 0K

A-1158, Task IV, Code Validation and Verification
 0976.040
 JUNE 1987

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 ---	0.3 ---
II. Direct Loaded Labor Costs	0	3
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	0	39
Travel	0	0
Other (computer roundoff)	0	1
G & A	0	6
	-----	-----
TOTAL COSTS	0	49

III. Funding Status

Prior FY Carryover -----	FY 87 Projected Funding Level -----	FY 87 Funds Received to Date -----	FY 87 Funding Balance Needed -----
\$ 50K	\$ 50K	\$ 0K	\$ 0K

A-1158, Task V, Short-term Technical Assistance
 0976.050
 JUNE 1987

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
Other (computer roundoff)	0	0
G & A	0	0
	-----	-----
TOTAL COSTS	0	0

III. Funding Status

Prior FY Carryover -----	FY 87 Projected Funding Level -----	FY 87 Funds Received to Date -----	FY 87 Funding Balance Needed -----
\$ 20K	\$ 20K	\$ 0K	\$ 0K

A-1158, Task VI, T. A. in Numerical Modeling
 0976.060
 JUNE 1987

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 ---	0.1 ---
II. Direct Loaded Labor Costs	1	1
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	1	24
Travel	0	0
Other (computer roundoff)	1	0
G & A	0	2
	-----	-----
TOTAL COSTS	3	27

III. Funding Status

Prior FY Carryover -----	FY 87 Projected Funding Level -----	FY 87 Funds Received to Date -----	FY 87 Funding Balance Needed -----
\$ OK	\$ 70K	\$ 70K	\$ OK

A-1158
 Total for Case 0976
 JUNE 1987

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	12.1
II. Direct Loaded Labor Costs	8	96
Materials and Services	0	0
ADP Support (computer)	1	11
Subcontracts	1	203
Travel	0	0
Other (computer roundoff)	1	3
G & A	0	16
TOTAL COSTS	11	329

III. Funding Status

Prior FY Carryover -----	FY 87 Projected Funding Level -----	FY 87 Funds Received to Date -----	FY 87 Funding Balance Needed -----
\$224K	\$464K	\$240K	\$0K