Sandia National Laboratories
Albuquerque, New Mexico 87185

September 15, 1987

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 August 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

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MANAGEMENT ISSUES

At the request of Neil Coleman, the A1158 Program Manager, a program review of A1158, "Repository Site Definition and Technology Transfer" was given to the NRC at Silver Spring, MD, on September 3, 1987. Charlene Harlan gave the project overview and a review of Tasks 1 through 3: Technology Transfer, Code Maintenance (QA), and Validation and Verification. Paul Davis gave a review of Tasks 4 and 5: BWIP Numerical Modeling and Short-Term Technical Assistance Efforts. There were approximately ten NRC staff and management in attendance, including Robert Browning, Director of NMSS/WM.

PROGRAM: Task I, 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 AUGUST 1987

During the later part of August, a program review for A1158 was prepared for presentation to the NRC September 3 at the Willste Building, DC. A portion of the staff time required for this effort was charged to the Technology Transfer task.

A copy of the final draft of the NEFTRAN User's Manual, NUREG/CR-4766, was delivered to the A1158 Program Manager. This report has completed the Sandia Management sign-off and has been sent to the Sandia printers for publication. Once publication is complete, the reports will be delivered to the NRC for distribution. This work is being shared by A1158 and A1266.

Paul Davis gave an invited talk to the National Academy of Sciences Water Science and Technology Panel on August 17, 1987 at the NAS Study Center in Woods Hole, Massachusetts. The NAS has convened this panel to produce a book on the current use and limitations of ground-water flow and transport models. The August 17th meeting was the first panel meeting and involved both project organization and general discussions of modeling issues. Mr. Davis' talk focused on the validation of flow and transport models used in assessing the performance of the proposed high-level waste disposal facilities. The panel will be addressing high-level waste disposal, however, they are interested mainly in chemical hazardous waste disposal. The major difference between the two problems is the long-term (10,000) predictions required for high-level waste disposal. Therefore, the validation issues discussed by Mr. Davis apply to both issues. In addition, the panel decided to include the Sandia study of models used at the Basalt Waste Isolation Project (BWIP) as one of the case studies.

PROGRAM: Task II, 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 AUGUST 1987

The CDC version of the NEFTRAN code was transmitted to INEL along with the eight sample problems from the User's Guide. SWIFT (Version 4.81) was also transmitted along with sample problems from the User's Guide, Self-Teaching Curriculum, and Verification and Field Comparison reports. Both codes were QA'd at INEL during August. The on-line help facility was expanded to include the new codes and now contains eleven codes installed on the INEL system. Copies of the interactive documentation for NEFTRAN and for SWIFT are enclosed for your information. The on-line help facility was also expanded to initially provide the user with a banner describing the QUALIB software library - the developers and purpose - before the menu of codes is provided. This banner and a copy of the current menu is also enclosed.

Friday, August 28, 1987, Mr. Robert Browning of NMSS/WM visited Sandia for an overview of waste management projects. He visited the Code Maintenance and QA Library in Charlene Harlan's office and was shown the physical library of reports, software procedures, program listings, and sample problem input and output listings. He was given a short demonstration of the on-line documentation in the software library. Given the short amount of time available for the overview, Mr. Browning seemed very pleased with the implementation of our QA Plan.

At the request of Mr. Browning, enclosed for your information is a copy of a recent audit performed by Sandia on the implementation of our QA Plan, NUREG/CR-4369. The reported results of this audit states that "The implementation of the plan, as well as the plan itself, is quite impressive given the relatively short time it has been in existence. No findings of significance were noted."

PROGRAM: Task III, 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 AUGUST 1987

No activity.

PROGRAM: Task IV, 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: $65K

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 AUGUST 1987

We are still having difficulty in obtaining all of the report figures from the graphic arts subcontractor. We had obtained assurances that all of the figures would be finished by the end of August. When it became evident that this deadline would not be achieved the contract managers for the subcontractor and at Sandia were contacted. The resolution from that meeting was that these figures would take top priority at the subcontractors company and that the subcontractor would write a letter assuming full reponsibility for the figures not being done (see attached letter). Figures that were received were reviewed and some were sent back for revision and titles were added to the others.

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: $25K

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, and IV.

ACTIVITIES DURING AUGUST 1987

No activity.

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

```
  QQQQQQ     UU       UU       AA       LL           IIIIIIIIII  BBBBBBBBB
 QQQQQQQQ    UU       UU      AAAA      LL           IIIIIIIIII  BBBBBBBBBB
QQ      QQ   UU       UU     AA  AA     LL           II  II  II  BB      BB
QQ      QQ   UU       UU    AA    AA    LL               II      BB      BB
QQ      QQ   UU       UU   AA      AA   LL               II      BBBBBBBBB
QQ      QQ   UU       UU   AA      AA   LL               II      BBBBBBBBB
QQ      QQ   UU       UU   AAAAAAAAAA   LL               II      BB      BB
QQ    Q QQ   UU       UU   AAAAAAAAAA   LL       LL      II  II  II  BB      BB
 QQQQQQQQ     UUUUUUUU    AA      AA    LLLLLLLLLL   IIIIIIIIII  BBBBBBBBB
  QQQQQQ Q     UUUUUU     AA      AA    LLLLLLLLLL   IIIIIIIIII  BBBBBBBBB
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QUALIB IS A QUALITY ASSURANCE LIBRARY DEVELOPED BY THE WASTE-MANAGEMENT SYSTEMS DIVISION OF SANDIA NATIONAL LABORATORIES FOR MAINTENANCE OF COMPUTER CODES FOR USE BY THE NUCLEAR REGULATORY COMMISSION IN HIGH-LEVEL WASTE MANAGEMENT.

FOR INFORMATION ON THESE CODES, PRESS RETURN TO CONTINUE...

MENU FOR QUALIB DOCUMENTATION:

```
1 - SWIFT          7 - DNET
2 - SWIFT II       8 - STEPWISE
3 - NWFTDVM        9 - PATH1
4 - GENNET        10 - USGS
5 - NEFTRAN       11 - TOUGH
6 - LHS
        20 - EXIT MENU
```

(SELECT A NUMBER AND PRESS RETURN)

NEFTRAN INTERNAL DOCUMENTATION:

```
*****************************************************************
*                                                               *
*   CODE NAME          -  NEFTRAN                               *
*                                                               *
*   VERSION            -  RELEASE JUNE 1987                     *
*                         CONVERTED FROM VAX TO CDC JULY 1987   *
*                                                               *
*   DESCRIPTION        -  THIS CODE IS AN ENHANCED VERSION OF THE *
*                         NETWORK FLOW AND TRANSPORT/DISTRIBUTED *
*                         VELOCITY METHOD (NWFTDVM) MODEL DOCU- *
*                         MENTED IN NUREG/CR-2081.  NWFTDVM SIMU- *
*                         LATES GROUND WATER FLOW AND CONTAMINANT *
*                         (RADIONUCLIDE) TRANSPORT. THE DISTRIBUTED *
*                         VELOCITY METHOD (DVM) PROVIDES FLEXI- *
*                         BILITY AND EFFICIENCY IN SOLVING THE  *
*                         RADIONUCLIDE  TRANSPORT PROBLEM.  IT  *
*                         ALLOWS FOR THE TRANSPORT OF DECAY CHAINS *
*                         OF ANY LENGTH, WITH ISOTOPES HAVING   *
*                         DIFFERENT RETARDATIONS, AND WITH SOURCE *
*                         RATES BEING LEACH- OR SOLUBILITY-LIMITED. *
*                         NEFTRAN PROVIDES NEW CAPABILITIES OVER *
*                         NWFT/DVM: (1) GENERALIZED FLOW NETWORK, *
*                         (2) MATRIX DIFFUSION, (3) LEG TRANSFER, *
*                         (4) MIXING CELL, AND (5) MULTIPLE CHAINS .*
*                                                               *
*   LANGUAGE           -  ANSI STANDARD FORTRAN, VERSION 77     *
*                                                               *
*   HARDWARE           -  CDC                                   *
*                                                               *
*   LIBRARIES          -  NONE                                  *
*                                                               *
*   EVOLUTION          -  THE NETWORK FLOW AND TRANSPORT (NWFT) *
*                         MODEL, SANDIA NATIONAL LABORATORIES,  *
*                         1978-1979                             *
*                         NWFTDVM MODEL, SANDIA NATIONAL LABORA- *
*                         TORIES, 1979-1981                     *
*                         GENNET, SANDIA NATIONAL LABORATORIES, *
*                         JULY 1984                             *
*                                                               *
*   DOCUMENTATION      -  (1) NWFTDVM USER'S MANUAL             *
*                             NUREG/CR-2081, SAND81-0886        *
*                         (2) NWFTDVM VERIFICATION              *
*                             NUREG/CR-3378, SAND83-1466        *
*                         (3) NEFTRAN USER'S MANUAL             *
*                             NUREG/CR-4766, SAND86-2405        *
*                                                               *
*   SANDIA CONTACTS    -  EVARISTO J. BONANO                    *
*                         CHARLENE L. HARLAN                    *
*                         GINGER F. WILKINSON                   *
*                                                               *
*****************************************************************
```

NEFTRAN FILES:

```
  NEFTCMP - NEFTRAN COMPILE FILE
  NEFTLGO - NEFTRAN COMPILED BINARIES
  NEFT01  - NEFTRAN SAMPLE PROBLEM 1,
            GENERALIZED NETWORK
  NEFT02  - NEFTRAN SAMPLE PROBLEM 2,
```

```
              LEG TRANSFER WITH CONSTANT ISOTOPIC VELOCITIES
    NEFT03  - NEFTRAN SAMPLE PROBLEM 2,
              NO LEG TRANSFER WITH CONSTANT ISOTOPIC VELOCITIES
    NEFT04  - NEFTRAN SAMPLE PROBLEM 2,
              LEG TRANSFER WITH VARYING ISOTOPIC VELOCITIES
    NEFT05  - NEFTRAN SAMPLE PROBLEM 2,
              NO LEG TRANSFER WITH VARYING ISOTOPIC VELOCITIES
    NEFT06  - NEFTRAN SAMPLE PROBLEM 3,
              MATRIX DIFFUSION
    NEFT07  - NEFTRAN SAMPLE PROBLEM 4,
              MIXING CELL
    NEFT08  - NEFTRAN SAMPLE PROBLEM 5,
              MULTIPLE CHAINS
    NEFTDOC - FILE CONTAINING DOCUMENTATION ON NEFTRAN

  NEFTRAN INTERACTIVE PROCEDURE:     (EXAMPLE USING NEFT01)
      GET,NEFTLGO/UN=CRH             (GET THE EXECUTABLE BINARIES)
      GET,TAPE5=NEFT01/UN=CRH        (EQUIVALENCE NEFT01 TO TAPE5)
      NEFTLGO,TAPE5,TAPE6            (LOAD AND EXECUTE THE BINARIES)
      .                                        .
      .                              (EXECUTION IN PROGRESS)
      .                                        .
      RETURN,*,TAPE6                 (RELEASE ALL FILES EXCEPT OUTPUT TAPE6)

  PROCEDURE TO GET A HARDCOPY OF THIS DOCUMENTATION:
      GET,NEFTDOC/UN=CRH
      (SEND THIS FILE TO YOUR PRINTER)
END OF FILE
```

```
SWIFT DOCUMENTATION:
    ************************************************************************
    *                                                                      *
    *   CODE NAME          -  SWIFT                                        *
    *                                                                      *
    *   VERSION            -  RELEASE 4.81                                 *
    *                                                                      *
    *   DESCRIPTION        -  SWIFT (SANDIA WASTE ISOLATION, FLOW          *
    *                         AND TRANSPORT MODEL) IS A 3D FINITE-         *
    *                         DIFFERENCE MODEL WHICH SIMULATES FLOW        *
    *                         AND TRANSPORT PROCESSES IN GEOLOGIC          *
    *                         MEDIA.  FOUR COUPLED TRANSPORT PRO-          *
    *                         CESSES ARE SOLVED SIMULTANEOUSLY BY          *
    *                         THIS CODE.  THE FIRST THREE CHARACTER-       *
    *                         IZE FLOW, HEAT AND BRINE TRANSPORT.          *
    *                         THE FOURTH IS ITSELF A COUPLED SET OF        *
    *                         EQUATIONS DEPICTING THE MIGRATION OF A       *
    *                         CHAIN OF RADIONUCLIDES.                      *
    *                                                                      *
    *   LANGUAGE           -  ANSI STANDARD FORTRAN, VERSION 66            *
    *                                                                      *
    *   HARDWARE           -  CDC CYBER 76 SERIES MACHINES                 *
    *                                                                      *
    *   LIBRARIES          -  NONE USED                                    *
    *                                                                      *
    *   EVOLUTION          -  INTERA TECHNOLOGIES, INC.  1975-1981         *
    *                                                                      *
    *   DOCUMENTATION      -  (1)  USER'S GUIDE                            *
    *                             NUREG/CR-2324, SAND81-2516               *
    *                         (2)  SELF-TEACHING CURRICULUM                *
    *                             NUREG/CR-1968, SAND81-0410               *
    *                         (3)  VERIFICATION & FIELD COMPARISON         *
    *                             NUREG/CR-3316, SAND83-1154               *
    *                         (4)  RISK METHODOLOGY:  SWIFT MODEL          *
    *                             NUREG/CR-0424, SAND78-1267               *
    *                                                                      *
    *   SANDIA CONTACTS    -  PAUL A. DAVIS                                *
    *                         CHARLENE L. HARLAN                           *
    *                         GINGER F. WILKINSON                          *
    *                                                                      *
    ************************************************************************

SWIFT FILES:
    SWICMP           - SWIFT FORTRAN IV COMPILE FILE
    SWILGO           - SWIFT COMPILED BINARIES
    SWI01 -> SWI16   - INPUT DATA FILES TO USER'S GUIDE SAMPLE PROBLEMS
    SWI17 -> SWI32   - INPUT DATA FILES TO STC SAMPLE PROBLEMS
    SWI33 -> SWI59   - INPUT DATA FILES TO VERIFICATION SAMPLE PROBLEMS
    SWIDOC           - FILE CONTAINING DOCUMENTATION ON SWIFT

SWIFT EXECUTION PROCEDURE:          (EXAMPLE USING SWI01)
    GET,SWILGO/UN=CRH               (GET THE EXECUTABLE BINARIES)
    GET,TAPE5=SWI01/UN=CRH          (SELECT 'SWI01' AS INPUT DATA FILE)
    RFL,0,400                       (REQUEST EXTENDED MEMORY)
    LDSET,PRESET=0                  (INVOKE THE LOADER AND PRESET THE CORE)
    SWILGO,TAPE5,TAPE6              (PROVIDE LOADER WITH NAME OF BINARIES)
    .                               .
    .                               (EXECUTION IN PROGRESS)
    .                               .
```

```
      RFL,0                          (RELEASE EXTENDED MEMORY)
      RETURN,*,TAPE6                 (RELEASE ALL FILES EXCEPT OUTPUT TAPE6)

 PROCEDURE TO GET A HARDCOPY OF THIS DOCUMENTATION:
      GET,SWIDOC/UN=CRH
      (SEND THIS FILE TO YOUR PRINTER)
END OF FILE
```

7 AUDIT 6/87

Sandia National Laboratories

Albuquerque, New Mexico 87185

date: June 25, 1987

to: R. M. Cranwell, 6416

from: D. A. Brosseau, 6440

subject: Quality Program Audit Results

This letter and attachments documents the results of a general audit completed by myself on June 24, 1987 in Room 3032, Bldg 823 (see attached announcement letter).

Auditee contacts were Charlene P. Harlan, the Division 6416 QA Coordinator, and Ginger F. Wilkinson, the principal author of the Division QA Plan.

This audit constitutes an independent verification of the status of implementatiion of the QA Plan, as outlined in the completed checklist items prepared prior to the audit. General observations are as follows:

1. The implementation of the plan, as well as the plan itself, is quite impressive given the relatively short time it has been in existence. No findings of significance were noted.

2. Those items checked as nonconforming - NC - primarily involved changing requirements with respect to use of forms as the implementation of the program evolved. It was suggested to evaluate the use or discontinuance of these forms and to possibly revise the QA Plan to reflect present usage. In some cases, alternate documentation means that met or exceeded the intent and purpose were provided - see comments in the checklist.

3. The auditees will pull together all QA Plan references for easy access and retrieval.

4. The disposition of problems reported via Appendix 2 should be addressed in a future revision to the QA Manual if deemed appropriate and forms and procedures should be implemented to facilitate verification of adequate corrective action.

No specific response to this audit report is required. This report will be made available to management and Sandia QA staff for information and to provide documentary evidence of the independent assessment provided herein.

Again, the work done to date to implement the Division 6416 QA Plan is commendable. This auditor very much appreciates the time taken and cooperation given on the part of Charlene Harlan and Ginger Wilkinson.

Copy to:

D. J. McCloskey, 6400
D. A. Dahlgren, 6440
N. R. Ortiz, 6410
C. P. Harlan, 6416
G. F. Wilkinson, 6416

Sandia National Laboratories

Albuquerque, New Mexico 87185

date: June 17, 1987

to: R. M. Cranwell, 6416
C. P. Harlan, 6416

from: Doug Brosseau, 6440

subject: Quality Program Audit

Please be advised that I will be conducting a general audit of the Division 6416 "Quality Assurance (QA) Plan for Computer Software Supporting the U.S. Nuclear Regulatory Commission's High-Level Waste Management Program", NUREG/CR-4369. This audit will occur 9:00 am, Wednesday, June 24, 1987 in Room 3032, Bldg 823.

The actual audit should take no more than one hour. It will involve walking through a prepared checklist developed based upon the requirements of your QA Plan. The only person required to be in attendance is C.P. Harlan, your QA Coordinator. It is my objective that this audit be viewed as an independent verification of the status of implementation of this relatively new QA Plan and as a means to identify areas of improvement in either the Plan itself or how it is being used.

This audit has been suggested by Chris Arana from Org. 7251. I expect to keep it rather informal yet provide the documentary evidence of all findings or observations.

Please let me know if there are any problems with the time scheduled above.

Copy to:

D. A. Dahlgren, 6440
N. R. Ortiz, 6410

6440 SURVEILLANCE CHECKLIST

Project: General Division Activities Org. 6416 Activity: QA Plan Report #: 6416-1

Project Contact: C.F. Harlan / G.F. Wilkinson Surveyor: D. Brosseau Date: 6/24/87 Page 1 of 9

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
Introduction					
1. How are peer reviews performed and documented? Provide documentary evidence	1.0, pp.1	✓		Primarily via the 6400 Manuscript Review sheet, and in other formal peer reviews. Evidence was provided	DaB 6/24/87
2. How is "management approval" reflected in "maintenance program" activities? Signoffs on forms available?	1.0, pp.1	✓		Through standard document review signoffs and other formal communications. Significant management oversight evident.	DaB 6/24/87
3. Copy of "Draft Quality Assurance Plan for Operational Software", Cole II + Silling; available?	1.0	✓		yes. All references will be collected and bound in a single location	DaB 6/24/87
4. Copy of NUREG-0856 available for reference?	1.0	✓		yes	DaB 6/24/87
5. Copy of 6000 QAPP available for reference?	1.0	✓		yes	DaB 6/24/87

6440 SURVEILLANCE CHECKLIST

Project:_____ Org._____ Activity:_____ Report #:_____

Project Contact:_____ Surveyor:_____ Date:_____ Page 2 of __

CSMS

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
6. Where is the CSMS repository of software; who controls it; how is it controlled and access standardized?	3.0 (1)	✓		Harlan + Wilkinson have and control access to the files library on the Open NOS system.	DaB 6/24/87
7. Where is the CSMS repository for documentation; who; how; etc.?	3.0 (2)	✓		In the QA Coordinator Office; again, Harlan + Wilkinson establish, maintain, and control all documentation in the CSMS repository.	DaB 6/24/87
8. Provide example evidence of:	3.0; pp 4	✓		Numerous examples were shown of these items and others: see remaining comments	DaB 6/24/87
a. command procedures		✓			
b. data library		✓			
c. file backup media, identification, control		✓		QUALIB in Open NOS provides conformance to these requirements.	
d. security; access control procedures		✓		Access is strictly controlled by QA staff using appropriate User ID/passwords.	

6440 SURVEILLANCE CHECKLIST

Project:_____ Org._____ Activity:_____ Report #:_____

Project Contact:_____ Surveyor:_____ Date:_____ Page 3 of __

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
storage					
9. QA Coordinator will establish in-house storage facilities for copies of each code; including backups	4.1.1	✓		This is done well.	DaB 6/24/87
10. Program listing of each program version	4.1.2	✓		okay	DaB 6/24/87
11. Verification test cases for each program version	4.1.3	✓		Sample problems in each code notebook, as well as User's Manuals, are used to comply with this requirement.	DaB 6/24/87
12. Indefinite retrievability (or retention). How documented and controlled?	4.1.4	✓		Nothing has yet been archived. When and if this happens, files would go on tape and be stored in the Division QA office.	DaB 6/24/87

6440 SURVEILLANCE CHECKLIST

Project:_____ Org._____ Activity:_____ Report #:_____

Project Contact:_____ Surveyor:_____ Date:_____ Page 4 of __

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
13. Mandatory QA Coordinator inclusion in manuscript review process. Provide evidence of use of Appendix I and signatures.	4.2	✓		Satisfactory; Appendix I used extensively.	DAB 6/24/87
14. Copy of ANSI N-413 available for reference?	4.2	✓		yes	DAB 6/24/87
15. Copy of FIPS Pub 18 available for reference?	4.2	✓		yes	DAB 6/24/87

6440 SURVEILLANCE CHECKLIST

Project:_____ Org._____ Activity:_____ Report #:_____

Project Contact:_____ Surveyor:_____ Date:_____ Page 5 of __

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
16. Show examples which show evidence of required internal documentation:	4.2.1			A number of examples were shown which thoroughly met the itemized list of requirements for internal documentation in the QA Plan. This has not been "backfitted" to all previous codes, however.	DAB 6/24/87
1) name and version		✓			
2) program description		✓			
3) original source		✓			
4) author name		✓		Author is often cited in the users manual; also the developer. A Sandia contact list is also cited.	
5) modification history		✓		An "evolution" section partially addresses this.	
6) proprietary details		✓		Mentioned, but seldom applicable. Dependency of other codes used is listed.	
7) language and version		✓			
8) hardware requirements		✓			
9) references (documentation)		✓			

6440 SURVEILLANCE CHECKLIST

Project:_____ Org._____ Activity:_____ Report #:_____

Project Contact:_____ Surveyor:_____ Date:_____ Page 6 of __

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
17. Provide evidence of output traceability documentation (name and version ident.)	4.2.2	✓		Examples provided, though some older versions and those provided by other developing organization have not necessarily been consistently provided with this info.	DAB 6/24/87
18. How do Users Manuals satisfy NUREG 0856 requirements? Checklist or procedure used to ensure/verify?	4.2.3	✓		Users Manuals are routinely reviewed against the requirements by QA staff for adherence prior to publication	DAB 6/24/87
19. Evidence of maintenance and control of "modified versions" of standard versions	4.2.3	✓		GENNET and GENMIX offered as examples of modified versions of the NWFTDUM standard.	DAB 6/24/87
20. Is there a documentation checklist to ensure requirements are met?	4.2.4	✓		There is an "Index of QA Documentation" in the QA notebook in addition to the "Files" binders.	DAB 6/24/87

6440 SURVEILLANCE CHECKLIST

Project:_____ Org._____ Activity:_____ Report #:_____

Project Contact:_____ Surveyor:_____ Date:_____ Page 7 of __

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
21. Provide evidence of discrepancy reporting (via Appendix 2, in CSMS.	4.2.5		✓	No problems have been reported yet. Blank forms should and will be added to the code QA manuals to spur use of this tracking document in the future.	DAB 6/24/97
* How does this report ensure corrective actions are taken and new versions are submitted? Plus Documentation of such?		✓		This question was discussed; this auditor will provide examples of means to verify and document adequate corrective action and disposition of problems reported.	
22. Examples of verification test case documentation by the PI's, in CSMS. How do the PI's plan and document for adequate program testing? Verification test plan? Peer reviews?	4.2.6	✓		SWIFT verification documentation briefly reviewed.	DAB 6/24/97
				It is the PI's responsibility. Sample problem sets, peer review comments and comment resolution are documented in a package for such work and reviewed by the QA Coordinator.	
			✓	An example set for NEFTRAN was submitted while this audit was underway.	

6440 SURVEILLANCE CHECKLIST

Project:_____ Org._____ Activity:_____ Report #:_____

Project Contact:_____ Surveyor:_____ Date:_____ Page 8 of __

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
~~Storage~~					
23. QA Coordinator will establish facilities for storage of documentation and tapes of all versions.	4.1.1 4.2.7				DAB 6/24/87
a) QA notebook for each program	4.2.7	✓		Evidence provided	
b) Summary Description of Computer Codes (Appendix 3)		✓		Examples cited.	
c) Software Distribution form to track versions (Appendix 4)		✓		The use of yellow form may diminish due to NRC distribution control requirements.	
d) Update Log to record modifications (Appendix 5)			✓	Updates are kept with each code. This actual log is not used. It was felt that what is done now to record modification history is more formal and better.	
e) Software Update Form (Appendix 6) to record modifications by personnel			✓	These activities are currently typically documented via memo; an example was cited. This form may not be useful. When reports are published, this form could be used as a cover sheet to document changes, and could be sent to the PI's to in turn provide the required information.	

6440 SURVEILLANCE CHECKLIST

Project:_____ Org._____ Activity:_____ Report #:_____

Project Contact:_____ Surveyor:_____ Date:_____ Page 9 of __

Characteristic	Ref.	Results C	Results NC	Observations/Findings	Initial & Date
24. Program maintenance records kept of update processor usage and documentation?	5.1	✓		LHS modifications were used as and example	Daf 6/24/87
a) Update Version / Reference Manual available for ref.?	5.1	✓		yes	
b) QA Coordinator periodic verification of program results / documentation (Interactive System)	5.2	✓		The Interactive System no longer applies and was replaced with an on-line help file in Open NOS — QUALHELP, Sufficient documents are forwarded and approved by the QA Coordinator that could allow reproduction of results if necessary.	
25. Distribution	6.0				
a) QA Coordinator approval of software prior to distribution: sign off?		✓		Manuscript Review Sheet for reports is used, The QA Coordinator now actually submits tapes for installation at INEL on behalf of the NRC	DaB 6/26/87
b) Software Summary Form — "NRC Scientific Software Submittal Package Description Form" — Appendix 7			✓	Not used. As above, software is installed at INEL at the direction of Sandia for the NRC. If NRC requirements for code distribution change, this form could be used.	

TECH REPS, inc. 5000 MARBLE, N.E. ● ALBUQUERQUE, NEW MEXICO 87110 ● (505) 266-5678 262-2077

September 1, 1987

Sandia National Laboratories
Dr. Paul A. Davis
Organization 6416
PO Box 5800
Albuquerque, NM 87185-5800

Dear Dr. Davis:

Due to the fact that TRI underestimated the complexity of the work to be performed under task 281, TRI has failed to meet the deadline of August 31, which was established in June.

Realizing this shortcoming in late August, we requested a priority list and have completed all of the work on said list. The current status of the entire job is that seventy-two out of the one hundred thirty-nine pieces of art have been completed. An additional twenty pieces will be delivered prior to September 3, 1987.

I realize that Dr. Davis placed his faith in our organization and has scheduled meetings with his program managers in Washington assuming that TRI would make our deadline. I believe that Dr. Davis was correct in assuming that TRI would meet our deadline since we have earned a reputation of performing on time and on schedule. By TRI's failing to make our promised deadline we have placed Dr. Davis in an untenable position. Our current estimate of the final completion date is no later than September 25, 1987. I apologize for this problem and would like the sponsors and project managers for this project to be aware that TRI is solely responsible for this failure to perform. Please accept our apologies and our commitment to meet this new deadline. I hope that our failure on this one occasion will not cause you to stop sending work to our firm.

Sincerely,

Donald E. Tiano
President

DET:ob

cc: Ruby Cochrell

A-1158, Task I, Technology Transfer
0976.020
AUGUST 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	4.6
II. Direct Loaded Labor Costs	4	37
Materials and Services	0	0
ADP Support (computer)	0	0
Subcontracts	2	116
Travel	0	0
Other (computer roundoff)	-1	-1
G & A	1	-3
TOTAL COSTS	6	149

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 II, Maintenance of Computer Codes
0976.030
AUGUST 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	9.2
II. Direct Loaded Labor Costs	4	73
Materials and Services	0	0
ADP Support (computer)	0	12
Subcontracts	-14	21
Travel	0	0
Other (computer roundoff)	0	0
G & A	-1	14
TOTAL COSTS	-11	120

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 III, Code Validation and Verification
0976.040
AUGUST 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	41
Travel	0	0
Other (computer roundoff)	0	0
G & A	0	6
TOTAL COSTS	0	50

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 IV, T. A. in Numerical Modeling
0976.060
AUGUST 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)	0.6	1.4
II. Direct Loaded Labor Costs	4	12
Materials and Services	0	1
ADP Support (computer)	0	0
Subcontracts	2	26
Travel	0	0
Other (computer roundoff)	1	0
G & A	1	4
TOTAL COSTS	8	43

III. Funding Status

Prior FY Carryover	FY 87 Projected Funding Level	FY 87 Funds Received to Date	FY 87 Funding Balance Needed
$ 0K	$ 65K	$ 65K	$ 0K

A-1158, Task V, Short-term Technical Assistance
0976.050
AUGUST 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	$ 25K	$ 5K	$ 0K

A-1158
Total for Case 0976
AUGUST 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)	1.6	15.5
II.	Direct Loaded Labor Costs	12	125
	Materials and Services	0	1
	ADP Support (computer)	0	12
	Subcontracts	-10	204
	Travel	0	0
	Other (computer roundoff)	0	-1
	G & A	1	21
	TOTAL COSTS	3	362

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

A1158

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

WM-RES

WM Record File
A-1158
SNL

WM Project 10, 11, 16
Docket No.
PDR ✓
LPDR ✓ (B NS)

Distribution:

NColeman	Joan ticket

(Return to WM, 623-SS)

4116