

A-1158

PDR
LPDR-W 10 (2)
WM-11 (2)
WM-16 (2)

WM s/f (426:1)
WMGT r/f
NMSS r/f
RBrowning
MBell
JBunting
PJustus
NColeman & r/f
MFliegel
PDR
LPDR (B,N,S)
EDavis, PPAS

JUL 30 1986

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WM-REG -
WM Record File
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WM Project 10, 11, 12
Docket No. _____
PDR ✓
LPDR B,N,S

Dr. Robert M. Cranwell, Supervisor
Waste Management Systems
Division 6431
Sandia National Laboratories
P. O. Box 5800
Albuquerque, NM 87185

Distribution: _____

(Return to WM, 623-SS)

Enclosure is a public info.

Dear Dr. Cranwell:

I have received and reviewed your June monthly progress report for project A1158, dated July 15, 1986. The work performed during June has been fully satisfactory.

The projected timeframe of August 19-21 is confirmed for the SWIFT II Technology Transfer Seminar. Please forward a final detailed outline for the seminar so that I may distribute copies to all course participants. It is requested that the seminar begin with an executive summary review of the code, its capabilities, and its potential roles in the high-level review program. In this way, NRC managers can obtain a quick overview of the SWIFT II code that will aid in the regulatory planning process. This summary review would also encapsulate the course content for those staff and contractors who will attend all of the three-day session.

I have received a copy of the final draft of the SWIFT II Self-Teaching Curriculum. Thank you for transmitting this document prior to the end of July within a timeframe that will allow advance study of the document by participants of the technology transfer seminar.

Please find enclosed a set of comments on the "TOUGH [Code] User's Guide". These comments were prepared based on input from both the Geotechnical and Engineering Branches of the Division of Waste Management. Also enclosed is an excerpt from the Federal Register, dated June 19, 1986. It contains proposed amendments to 10 CFR Part 60 that would conform existing NRC regulations to the environmental standards promulgated by EPA for the management and disposal of high-level wastes. It is requested that you and your staff review these amendments to become familiar with proposed changes to 10 CFR Part 60.

As a final comment, please note that Philip Justus is the Acting Chief of the Geotechnical Branch. Please add his name to your correspondence list in place of Malcolm Knapp, our former branch chief.

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The action taken by this letter is considered to be within the scope of the current contract A1158. No changes to cost or delivery of contracted services and products are authorized. Please notify me immediately if you believe that this letter would result in changes to cost or delivery of contracted products for project A1158.

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Neil M. Coleman, Project Manager
Hydrology Section
Geotechnical Branch
Division of Waste Management, NMSS

cc:
G. Wilkinson, SNL
C. Harlan, SNL

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Review of LBL-20700: TOUGH User's GuideGeneral Comments

Overall, the document appears to be very well organized and to have previously undergone extensive technical and editorial reviews. With respect to NRC's high-level radioactive waste review program, it would be helpful to include additional discussions that relate to the staff's potential uses of the code. For example, very little information is presented regarding the simulation of coupled flow in fracture networks. Although the study by Rulon et al. (1985) regarding Yucca Mountain hydrology is cited, it would be helpful if the text addressed to a greater extent the methods of simulating fracture networks in the modeling of complex site conditions.

In addition, it is not clear how a user would simulate the presence of waste packages and other components of the engineered barrier systems. This is very important for NRC's future assessment of the predicted performance of these systems. It is also important to include a brief discussion regarding how the TOUGH code might be integrated with other codes, such as waste package performance codes. The inclusion of these kinds of discussions would increase the overall usefulness of the user's guide for both NRC staff and contractors.

Specific Comments

page 3, paragraph 1: The process of "Knudsen diffusion" is amplified in lines 6-8 of this paragraph. The process of "binary diffusion" (i. e., two-phase diffusion) should be amplified in similar fashion.

page 6, continuing paragraph: In line 6, the expression "contributes only for gas phase flow" should be replaced by "contributes only to gas phase flow".

page 9: The line following Table 1 should be indented as a new paragraph. In addition, on this page reference is made to the use of "sparse storage techniques" during the iteration process. Although a reference is cited, it would be helpful to briefly describe this method in the text.

page 17, last paragraph: It is stated that the major arrays used by TOUGH and their characteristics are described in full detail in comment cards in the MAIN program. This information should be included as an appendix to the user's guide. This would be helpful to potential user's who may not happen to have a copy of the code itself.

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page 22, last paragraph: The text states that "[F]or the most commonly used cylindrical or linear flow geometries, [the authors] have written simple FORTRAN programs to carry out the elementary geometric calculations involved....." From the text it is not clear how a user would access these programs. Are they simply invoked as options or is the procedure more complex? Please clarify.

page 44, last paragraph, line 5: Replace the expression "larger computing" with the term "increased computational".

page 46, Table 7: Under element sho 11-sho 12, the following statement appears as a generation option: "well with two feeds on deliverability against specified bottomhole pressure at top feed; gravity correction for bottomhole pressure at lower feed." Although it is recognized that descriptions in tables generally must be kept brief, the meaning of this statement is very unclear and should be amplified. A simple diagram in the text may be helpful.

REFERENCE: Rulon, J., G. S. Bodvarsson, and P. Montazer. Preliminary Numerical Simulations of Groundwater Flow in the Unsaturated Zone, Yucca Mountain, Nevada, U. S. Geological Survey Water Resources Investigation Report, 1985.

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FROM Robert M. Cranwell, Sandia Nat'l Lab		DATE OF DOCUMENT 7/15/86	DATE RECEIVED 7/16/86	NO MM86-619
TO Neil M. Coleman		LTR XX	MEMO	OTHER
CLASSIF		ORIG.	CC XX	DATE ANSWERED BY 7/31/86
POST OFFICE	REG. NO.	FILE CODE: 426.1	ACTION NECESSARY <input checked="" type="checkbox"/>	CONCURRENCE <input type="checkbox"/>
DESCRIPTION (Must Be Unclassified) June monthly progress report for FIN A-1158		REFERRED TO P. Justus, WMG	NO ACTION NECESSARY <input type="checkbox"/>	COMMENT <input type="checkbox"/>
ENCLOSURES Ticket Closed by letter to CRANWELL 86/07/30		DATE 7/17	RECEIVED <i>[Signature]</i>	DATE 7/17
REMARKS Summed in 5520.411				