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WM Project 10, 11, 16
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PDR
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Ms. Pauline Brooks, Project Officer
Division of Waste Management
MS 623 SS
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Distribution:
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Subject: Contract No. NRC-02-81-026
Benchmarking of Computer Codes and Licensing Assistance
Monthly Letter Progress Report for June 1986

Dear Pauline:

This letter contains a management level summary of progress during the month of June.

Task 3 – Benchmark Problem Report – Waste Package Codes

The final report was submitted to NRC July 7.

Task 4 & 5 – Siting Codes

During June, GeoTrans worked on revising the final Task 4 & 5 report. Revisions to this report are taking longer than planned. GeoTrans has requested additional funding to complete the required work. CorSTAR is evaluating this request. We will provide status when it is available.

Tasks 4 & 5 – Radiological Assessment Codes

NRC's comments on the draft final report were received in early June and outside QA review by Bruce Mann was received at the end of June. Some effort this month was directed at responding to the NRC comments.

Tasks 4 & 5 – Repository Design Codes

A question raised by Mr. Krishan Wahi about the in situ stress in problem 6.3 was addressed in a letter from Acres. (copy attached).

All applicable codes have been procured, compiled, and used to run Benchmark Problems. Difficulties encountered while compiling ADINA at Brookhaven led to a solution which resulted in restrictions in running one field validation problem (Problem 6.3 - BWIP). This restriction has been discussed in detail in previous progress reports.

Since Problems 5.1 and 5.3 cannot be adequately modeled with ADINAT/ADINA, as discussed in last month's report, we recommend that they be replaced with Problem 5.2 for ADINAT/ADINA benchmarking.

General

On June 9 and 10 a program review meeting was held in Berkeley. The NRC was represented by Pauline Brooks and CorSTAR was represented by Chuck Rosselle, Dick Chapman, and Doug Vogt. The status of each task was discussed and a preliminary schedule and budget required for the completion of each task was presented.

Much of June was devoted to establishing priorities and refining the budget and schedule requirements for the completion of each task.

Estimated costs to date through the end of June (June 21 for CorSTAR and June 30 for Acres and GeoTrans) is \$3,610,429.11.

Yours sincerely,



Charles J. Rosselle
Project Manager

CJR:kg



June 10, 1986
P6678.00

Mr. Krishnan K. Wahi
Gram Incorporated
1709 Moon NE, Suite 110
Albuquerque, New Mexico 87112

Dear Mr. Wahi:

Contract No. NRC-02-81-026
Benchmarking of Computer Codes

This letter is in response to a recent telephone conversation between yourself and Acres regarding the input data to Benchmark Problem 6.3 - BWIP. The Benchmark Problems Report (NUREG/CR-3636) provides the following in situ stress data:

SIGMA ₁ =7MPa	N81W Dip 11° Up
SIGMA ₂ =2MPa	N8E Dip 5° Up
SIGMA ₃ =2MPa	S65W Dip 77° Up

In the definition of this problem, no reference was made to the North direction. Thus the bearings given do not indicate the direction of the major stress relative to the excavation. In modeling this problem with the MATLOC and VISCOT codes, we have assumed that SIGMA₁ and SIGMA₂ act in the horizontal direction, and that SIGMA₃ acts in the vertical direction. We have further assumed that an average horizontal stress acts throughout the modeled region, with magnitude equal to $(7+2)/2 = 4.5\text{MPa}$

The finite element mesh used in the models consisted of 8-noded axisymmetric elements and is shown on the enclosed figure. For both codes, initial runs were made to define the in situ stress state and to redistribute the stresses due to the excavation. In the initial runs, the vertical stress was applied to the top model boundary, and the horizontal stress was applied to the right-side vertical boundary. An additional loading condition was applied to account for the effects of the excavation of the room. Tensile loads, corresponding to the horizontal and vertical components of the in situ stress state were applied to the element surfaces along the excavated surface. In all runs, roller boundaries were assumed along the vertical symmetry boundary and along the bottom of the modeled region.

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All of the loading and boundary conditions discussed above are shown on the enclosed figure. If you have any further questions, please let us know.

Very truly yours,



D. W. Lamb
Manager
Project Operations

Enclosure

Ec. CorSTAR

