

Sandia National Laboratories

Albuquerque, New Mexico 87185

WM DOCKET CONTROL CENTER

'84 APR 24 11:31

April 16, 1984

WM Record File
A1755

WM Project 10
Docket No. _____

PDR D
LPDR (C, H, S)

Distribution:
Nataraja

(Return to WM, 623-SS) _____ C2

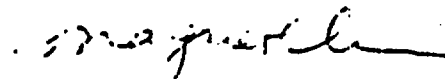
Mysore S. Nataraja
Waste Management Engineering Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
7915 Eastern avenue
Silver Spring, MD 20910

Dear Dr. Nataraja:

Enclosed please find the Project Work Plan for FIN A-1755,
"Coupled Thermal-Hydrological-Mechanical Assessments and Site
Characterization Activities for Geologic Repositories."

If you have any questions, please contact either Dr. K. Wahi or
myself.

Sincerely,



Margaret S. Chu

MSC:6431:vr

8409120085 840416
PDR WMRES EXISANL
A-1755 PDR

PROJECT WORK PLAN

a) Program Plan

The technical assistance effort is expected to be a combination of document (or methodology) reviews, participation at meetings, and sensitivity analyses using existing models. It is important to coordinate the sensitivity analyses in such a way that project continuity is maintained and maximum benefit is realized from these calculations. We plan to consult with the NMSS Project Manager (PM) and propose specific analyses after we have some knowledge of the DOE schedules.

When a review request is received from the NMSS Project Manager, the SNLA Principal Investigator (PI) will designate the appropriate staff members or subcontractors to perform the review. The appointed reviewer and the PI will determine if the review can be performed within the allotted time; the NMSS PM will be informed immediately if it appears that more time is required. Every effort will be made to accommodate circumstances beyond NRC's control. Whenever possible, the review comments will be inspected by either the PI or Dr. Wahi (or both).

For each task order that requires a final report, a minimum of two independent reviews of the draft and the final reports will be made at SNLA. One of these reviews will be performed outside Division 6431. In addition, as a part of SNLA's QA procedures, management reviews of final reports are mandatory.

The uncertain nature of the time at which these reviews and meeting participations might be required makes it difficult to be more specific at this time.

b) Meetings, Data Reviews, Workshops, Site Visits

SNLA will send the appropriate personnel to meetings, workshops, etc. at the NMSS PM'S request. If the person requested has a schedule conflict, an alternate candidate will be proposed. Trip reports will be submitted unless specified otherwise by the NRC. It is understood that planning and strategy meetings might precede certain data review visits or workshops, and that SNLA's participation at such pre-meetings might be necessary.

c) Preliminary Conceptual Models

SNLA interprets these as analytical and/or numerical models to simulate phenomena or systems associated with geologic repositories. A number of computer codes are available that can be used for thermal, thermomechanical, and thermo-hydrological analyses. The selection of these codes can be made at the time of application. However, it might be prudent to have some of the preferred codes installed at Sandia as soon as feasible. The following codes are already available at Sandia's computing facility: COYOTE, ADINAT, SANCHO, STEALTH, and SWIFT. At the PM's direction, SNLA will apply one or more of these models to perform thermal, mechanical, or hydrologic analyses. Interpretation of results may involve NKC participation. Some information transfer on the application of models may also be required.

d) Sensitivity Studies

The key personnel at SNLA and the NMSS PM should discuss the kinds of sensitivity analyses that are relevant to the thermal-mechanical-hydrologic evaluations. Potential couplings between any two or among all three of these phenomena can be assessed by means of sensitivity analyses. In addition, SNLA has substantial experience in considering input parameter uncertainties.

The simplest kind of sensitivity analysis, in our opinion, is that of thermal response in the near field or far field. In the very-near field, the effect of the backfill can be evaluated. To assure stability during the operational phase, thermomechanical and structural response calculations are likely to be performed with non-linear numerical models.

A more specific application of the sensitivity analysis might involve variations of the constitutive model for a given medium. For example, the in-situ tests at the Gable Mountain Near Surface Test Facility (NSTF) indicate anisotropic behavior. It is possible that the measured levels of anisotropy do not significantly affect the predicted response; or alternately, the uncertainty in the isotropic moduli covers the range of anisotropy. Since the Jointed Block Test is underway and the Heater Tests have already been completed at BWIP, we propose to analyze those tests first.

e) Key Personnel

Dr. M. S. Y. Chu	(SNLA PI)
Dr. K. K. Wahi	(Thermomechanics)
Mr. M. Board	(In-Situ Testing)
Mr. C. D. Updegraff	(Hydrology)
Dr. R. V. Guzowski	(Geology)
Dr. P. L. Tien	(Geology)
Prof. J. J. Daemen*	(Rock Mechanics)

At this time, we do not anticipate a significant effort in the area of geology. However, we have identified certain personnel in that area in case a need should arise.

f) Reporting Requirements

Based on the Statement of Work, we have interpreted the following reporting requirements:

<u>Report Type</u>	<u>Contents</u>	<u>Due Date</u>
Project Work Plan	Methodology for Design Review	4/30/84
Monthly	Project status, work accomplished during the month	20th of the following month
Draft Technical Letter Report	Work under specific task orders; allow 15-day comment period	"A" (as agreed to by NMSS, PM and SNLA)
Final Technical Letter Report	Finalized version of the draft report	35 working days after "A"
Trip or Meeting	Activities at the meeting, impressions and comments	20 working days after completion of trip

g) Schedules

TBD (to be determined).

*Expected to be under contract in the near future.