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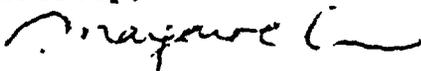
Dr. M. S. Nataraja  
Engineering Branch  
Division of Waste Management  
U.S. Nuclear Regulatory Commission  
7915 Eastern Avenue  
Silver Spring, MD 20910

Dear Dr. Nataraja:

The enclosed monthly report summarizes the activities during the month of May for FIN A-1755.

If you have any questions, please feel free to contact either myself at FTS 844-9931 or Krishan Wahi at FTS 844-6268.

Sincerely,



Margaret S. Chu  
Waste Management Systems  
Division 6431

MSC:6431:jm

Copy to:  
6431 R. M. Cranwell  
6431 M. S. Y. Chu  
6431 K. K. Wahi

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A-1755 PDR

PROGRAM: Coupled Thermal-Hydrological- Mechanical Assessments and Site Characterization Activities for Geologic Repositories FIN#: A-1755

CONTRACTOR: Sandia National Laboratories BUDGET PERIOD: 3/84-9/84

DRA PROGRAM MANAGER: M. S. Nataraja BUDGET AMOUNT: 250K

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

PRINCIPAL INVESTIGATOR: M. S. Y. Chu FTS PHONE: 844-9931

### PROJECT OBJECTIVES

To provide technical assistance to NRC in the assessment of coupled thermal-hydrological-mechanical phenomena and site characterization activities for high-level waste repositories.

### ACTIVITIES DURING MAY 1984

#### Activities and Accomplishments

A preliminary analysis of shaft seal failure in the Exploratory Shaft at a generic bedded salt site was performed at NRC's request. The DNET code, developed by SNLA for NRC, was used to perform flow calculations for a number of scenarios. A reference, baseline calculation was done that represented intact seals. Two types of failure scenarios were then considered. In one type, the annular region around the shaft plug was given enhanced hydraulic properties (i.e., higher conductivity and porosity) and water from the upper aquifer allowed access to this zone of high conductivity. Different cross-sectional areas and conductivities were used to make multiple runs of the same scenario. In the other type, an initial "borehole" of higher conductivity acted as a surface along which salt dissolution could occur due to water intrusion. The code allows potential enlargements of this hole following enhanced flow rates due to a failed seal. In certain variations, potential closure due to salt creep was included. A primary (but preliminary) conclusion is that salt dissolution can become a potential concern. When creep is allowed to occur, the enlargement due to dissolution is compensated to a fair extent. The results of this analysis were presented to NRC at a meeting in Silver Spring on May 25, 1984. We have requested a continuation of this effort using a more refined network of flow legs and more representative (perhaps site-specific) input data for the model.

Document reviews were continued during the month as requested by NRC. A copy of one review that was completed is enclosed; three other reviews will be completed some time during June.

K. Wahi attended a symposium on "Shaft Drilling Research and Innovative Shaft Drilling Activities" in Las Vegas, Nevada on May 18, 1984. A tour of the Nevada Test Site was given by the symposium organizers on May 19. A trip report is enclosed.

J. Daemen and K. Wahi attended a meeting in Silver Spring, MD on May 24-25, 1984 at NRC's request. The primary purpose of this meeting was to discuss a response to J. Neff's (DOE) letter to NRC on the subject of exploratory shafts in salt. A trip report (by K. Wahi) is attached that summarizes the activities at that meeting. Written comments to the subject letter have also been provided to NRC by K. Wahi and J. Daemen.