Lawrence Livermore National Laboratory

NUCLEAR SYSTEMS SAFETY PROGRAM

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Geotechnical Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: MONTHLY MANAGEMENT LETTER REPORT NO. 8
Progress for the Month of November 1983
NRC FIN A0294
Technical Assistance in Seismo-Tectonic Impacts in Repositories

1. PROGRAM OBJECTIVES AND DESCRIPTION

The objective of this program is to provide technical assistance to the U.S. Nuclear Regulatory Commission (NRC) on waste repositories in the following areas:

a. Reviewing the uncertainties and limitations of the data and methods used in seismo-tectonic investigations completed by the U.S. Department of Energy (DOE).

b. Identifying and evaluating issues[1] in seismo-tectonics related to design and construction, long-term repository performance and groundwater flow.

c. Providing input to the technical basis for NRC technical positions in the area of seismo-tectonics.

Our approach to achieve this objective is to evaluate DOE's seismotectonic assessments through review of related DOE reports, including Site Characterization Plans (SCP); participation in workshops and site visits;

1 An issue is a question about a site that is critical to determination of site suitability at the construction authorization stage in terms of the performance objectives and requirements of 10 CFR 60, Subpart E.

and identification and evaluation of issues in seismo-tectonics related to design and construction, long term repository performance and groundwater flow. We will provide input to the technical basis for NRC technical positions in the area of seismo-tectonics.

Site characterization review plans for FY 83 and FY 84 include Hanford-BWIP site, NNWSI, and a salt site. In preparing our reviews, we will consider the guidelines found in Regulatory Guide 4.17, "Standard Format and Content of Site Characterization Reports for High-Level Waste Geologic Repositories," "Review Plan for Site Characterization," and 10 CFR 60 (draft), "Disposal of High-Level radioactive Wastes in Geologic Repositories: Technical Criteria."

Specifically, the NRC has requested LLNL to assist the NRC in meeting the needs described above by performing independent review and associated studies based upon LLNL's experience and expert knowledge.

Specific Work Requirements

There are two (2) tasks as follows:

Task 1: Review of the DOE Site Characterization Program in Seismo-Tectonics

1.1 Preparatory Site Characterization Program Review
1.2 Preparatory Site Characterization Analysis
1.3 Review of SCP and SCP Biannual Updates
1.4 Review of Public Comments

Task 2: General Technical Assistance to NRC

With these tasks and subtasks above, four sets of NRC needs are recognized.

First, there is the need to assemble existing data base and adequacy of methods used to collect and interpret the data. Second, there is the need to perform site-specific seismo-tectonic issues (in basalts at Hanford, tuff at the Nevada Test Site (NNWSI) and a salt site, yet to be determined). Third, there is the need to identify other additional information needed to perform quantitative assessments to determine if there is reasonable assurance that the site will meet the performance objectives of 10 CFR Part 60. The fourth need is to contribute to the technical basis for NRC technical positions or appendices to the Site Characterization Analysis (SCA) in the area of seismo-tectonics.

2. PROGRESS - NOVEMBER 1983

Our major effort for the reporting period was placed upon Task 1.

During this reporting period, we have initiated our preparation of a draft Site Technical Position (STP) paper for the BWIP site. To properly assess the Technical Criteria of 10 CFR Part 60 (based on the current information available for the BWIP site), the following specific issues concerning the geologic stability of the site need to be addressed.

1. What is the conceptual tectonic model(s) of the Cold Creek syncline and surrounding area?

2. Is rupture due to faulting possible on or below the surface at the RRL?

3. What is the impact of the Rattlesnake-Wallula Alignment (RAW) on the RRL site?

4. What is the earthquake hazard at the RRL site?

We are currently developing our STP issues (with discussion) along this line.

Literature review concerning mid-continental seismicity and salt dome tectonics was initiated. We found it interesting that Jackson and Seni (1983) considered in their paper in GEOLOGY VOL. 11 (March 1983) the tectonic environment and driving forces associated with formation of inner Gulf salt domes and related structures. This paper indicates that growing salt domes had geomorphic effects on strata as young as Eocene but were silent regarding effects, if any, on younger beds. The mean net Tertiary rate of dome growth was estimated as 35 meter per million years. Implications of this rate are being investigated.

Considerable efforts are being made in our preparation for an LLNL independent evaluation of the BWIP site, the NNWSI site and salt sites.

3. PLANS FOR NEXT MONTH

Continue to work on a STP paper for the BWIP site. Meet with the NRC/PM and staff for technical coordination.

4. ESTIMATED PROJECT FINANCIAL STATUS

See Attachment A

5. LIST OF CONSULTANTS/SUBCONTRACTORS

D. Burton Slemmons, Consulting Geologist

6. PROJECT CONCERNS

None.

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Project Title: Seismo-Tectonic Impacts in Repositories

ATTACHMENT A

Estimated Monthly Letter Financial Section

FIN No. A0294

A. PROJECT COSTS:

Funds Obligated to Date: (FY 83 and FY 84)	$500K
FY 84 Budget:	$350K

B. COST ANALYSIS*

	November	Cumulative ($K)	
Direct Lab Staff Effort	1.3 FTE-MO	1.7 FTE-YR	
Direct Salaries	$7.0K	$ 67.7K	
Materials & Services (excluding ADP)	0.2	1.2	
ADP Support	0	0	
Subcontracts	0	26.4	
Travel Expenses	0.8	12.0	
Indirect Labor Costs	7.2	67.6	
Other (TID)	0	0.3	
General & Admin.	4.6	29.5	
Total	19.9	204.8	(41)% of Funding Available
Liens (Slemmons)	5.6	5.6	
Total Obligations	$25.5K	$210.4	

*Note: These figures are for cost analysis only and may differ slightly from final billing figures.