



ENGINEERS INTERNATIONAL, INC.

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18 October 1982
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High Level Waste Technical Development Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
7915 Eastern Avenue
Mail Stop 623-SS
Silver Spring, MD 20910

Attention: Mr. Trueman Seamans, Mail Stop 623-SS, Project Officer

Subject: NRC /Contract No. NRC-02-82-030 (EI Project No. 1085)
"Technical Assistance For Design Reviews"
Monthly Technical Report Covering the Period of
01 September to 30 September 1982

Ladies and Gentlemen:

Enclosed please find one (1) copy of the subject report as required by the contract. Also as required, the following persons are also being sent copies:

- Office of the Director, NMSS
- Director, Division of Waste Management
- Contracting Officer

Should you have any questions please do not hesitate to contact the undersigned.

Sincerely,

ENGINEERS INTERNATIONAL, INC.

V. Rajaram
V. Rajaram
Project Manager

VR/ja
Enclosure

cc: Office of the Director, NMSS
(ATTN: Program Support Branch) - 1
Director, Division of Waste Management - 2
Contracting Officer - 1

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PDR WMRES EECEN01
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ENGINEERS INTERNATIONAL, INC.

EI Project No. 1085

NRC Contract No. NRC-02-82-030

TECHNICAL ASSISTANCE FOR DESIGN REVIEWS

Second Monthly Report - 01 September to 30 September 1982

1.0 INTRODUCTION

A letter dated September 29, 1982, was received from the NRC project Manager suggesting changes in the content of future progress reports. These suggested changes have been incorporated in this progress report.

This progress report covers the activities of Engineers International, Inc. (EI) during the period 01 September to 30 September 1982. Professional Personnel involved were Messrs. Kendorski, Dunn, Ma, Aucutt, Hambley, Bhattacharya, Dr. Singh and Dr. Rajaram. The hours spent on the project by both professional and non-professional personnel are given below.

<u>NAME</u>	<u>TITLE</u>	<u>TASK I</u>	<u>TASK II</u>
V. Rajaram	Project Manager	56	
M. Singh	Staff Consultant	5.5	
A. Mahtab	Rock Mechanics Consultant	16	
F. Kendorski	Engineering Manager	12	
M. Dunn	Project Engineer	72	
D. Hambley	Senior Mining Engineer	8	
S. Bhattacharya	Staff Engineer	3	
M. Ma	Staff Engineer	9.5	
D. Aucutt	Quality Assurance Engineer	9	
J. Anderson	Technical Typist	17	
K. Onarato	Technical Typist	4	
B. Tallant	Technical Typist	1	
B. Kruder	Draftsman	1	
	TOTAL	214	

2.0 PROJECT OBJECTIVE

The objective of this contract is to provide technical assistance to the NRC in reviewing site characterization reports and other documents related to repository design and construction to ensure the safety of personnel, and the protection of the population and environment from radionuclide release.

3.0 ACTIVITIES REPORTED PREVIOUSLY

3.1 Summary of Activities

A contract initiation meeting was held at the NRC Washington, DC offices on 09 and 10 August 1982 to discuss the Technical and Cost Proposal submitted by EI. At this time, EI received six documents for review along with background reports of related studies.

The following documents were reviewed with respect to rock mechanics design, repository design and operation, shaft drilling and grouting, in-situ geomechanics tests, and quality assurance; all in regard to compliance or noncompliance with 10CFR60:

1. "Test Plan for Phase I of an Exploratory Shaft Facility in Basalt," DOE, August 1981
2. "NWTs Program Strategy and Guidelines for the Development of Test Facilities at Candidate Repository Sites," DOE, January 8, 1982
3. "Nuclear Waste Repository in Basalt, Project B-301, Conceptual System Design Description, Volume 1," RHO-BWI-C-116, Draft, September 30, 1981
4. "Nuclear Waste Repository in Basalt, Conceptual Design," Drawings, September 1981
5. DOE Presentation during June 9-11, 1982 NRC Staff Trip to BWIP
6. "Nuclear Waste Repository in Basalt Project B-301, Functional Design Criteria," RHO-BWI-CD-38, REV 3, November 1980

3.2 Results

The document review resulted in a number of questions and comments in the following areas:

- Rock mechanics design
- Repository design and operation
- Quality assurance
- Shaft drilling and grouting
- In-situ geomechanics tests

The resulting draft letter report was sent to the NRC on 27 August as required by the Task Order 001 schedule.

4.0 ACTIVITIES DURING THE REPORTING PERIOD

4.1 Summary of Activities

The objectives of this period were to meet with the NRC in Silver Spring, Maryland, to discuss the draft letter report and to prepare for the BWIP design workshop scheduled for October 1982. Information necessary to prepare a proposal for Task Order 002 was also obtained.

Dr. V. Rajaram and Mr. M. Dunn of EI, and Dr. A. Mahtab, EI consultant met with the NRC staff on 14 September, 1982 to discuss the draft report. Areas of discussion included:

- Data collection at the BWIP site
- Design issues at the BWIP site
- Evaluation of testing program
- Validity of BWIP design criteria
- DOE modeling for stable openings

Messrs. Kendorski and Hambley and Dr. Rajaram attended a meeting in Silver Spring, Maryland on September 15, 1982 to prepare for the Basalt Waste Isolation Project (BWIP) design workshop scheduled for October 4-8, 1982. Questions were prepared on the following areas to determine the BWIP design approach.

- In-situ Stresses
- In-situ Strength
- Stable Openings
- Borehole and Shaft Sealing
- Retrievability
- Conceptual Design
- In-situ Test Plans

4.2 Results

NRC comments were noted, particularly that policy issues related to the Test and Evaluation Facility (TEF) should be avoided. Discussion clarified some aspects of the BWIP program such as the exploratory shaft (ES) lining requirements, the importance of rock mass strength relative to laboratory values, and the concept of rock stress safety factor.

Several documents for Task Order 002 were received to help develop the proposal which was subsequently sent to the NRC on 21 September 1982.

The questions on BWIP design issues submitted by EI were discussed with the NRC, and a final set of questions for use in the BWIP design workshop were prepared.

A modification of Task Order 001 to review the RFP for the Exploratory shaft prepared by DOE was suggested by the NRC. EI submitted a request on September 24, 1982, for additional funds to complete the proposed modification. This request is under review by the NRC at the present time.

5.0 QUALITY ASSURANCE

For improved document control, a sign-off sheet has been incorporated with each report and is signed by the author project engineer, quality assurance engineer, and project manager for final approval. A document control log chronologically lists all letters and reports sent by EI, each document having a reference number. All documents received from the NRC are properly logged.

6.0 DIFFICULTIES

None

7.0 ACTIVITIES PLANNED FOR THE NEXT REPORTING PERIOD

Dr. Rajaram and Mr. Kendorski will attend the BWIP design workshop at Richland, Washington, during October 4-8, 1982. A trip report will be prepared summarizing the results of the workshop.

Work will begin on modification 1 of Task Order 001 upon written authorization by the NRC Division of Contracts.

Work will begin on Task 002 upon written authorization by the NRC Division of Contracts.

8.0 MEETINGS/TRIPS DURING THE REPORTING PERIOD

A meeting was held on 14 September 1982 to discuss and review the Task 001 draft final report. A meeting was held on 15 September 1982 to prepare for the BWIP design workshop scheduled for October 4-8, 1982.

9.0 SCHEDULE AND COST PROJECTIONS

The following Task 001 schedule and cost information is attached for NRC review:

- Project Cost Summary
- Projected and Completed Work Bar Chart

Respectively submitted,

ENGINEERS INTERNATIONAL, INC.

Michael F. Dunn

Michael F. Dunn
Project Engineer

MFD/ja

TABLE 1 - PROJECT COSTS THROUGH SEPTEMBER, 1982

TASK	CURRENT MONTH	CUMULATIVE TO DATE FY 82	TO DATE FY 83	TOTAL TO DATE	FY 83 PROJECTIONS TO END OF PROJECT		TOTAL CONTRACT LIMIT
					OCTOBER	NOVEMBER	
ORDER 001							50,685.00
I	13,514.49	39,257.52	-	39,257.52	4,427.48	-	NA
II	-	-	-	-	7,000.00	-	NA
ORDER 002							
I							
II							

ENGINEERS INTERNATIONAL, INC.

PROGRAM SCHEDULE

Task Order 001 - Contract No. NRC-02-82-030

WEEKS

TASK	1	2	3	4	5	6	7	8	9	10	11	12
<u>Task I</u>												
a. BWIP Data Analysis		-----										
b. Eval. of Design Issues		-----										
c. Eval. BWIP Testing Prog		-----										
d. Examine Validity of Design		-----										
e. Check DOE's Modeling		-----										
f. Prepare Draft Final			-----									
g. Prepare Final Report										-----		
h. Meetings with NRC	==					=						
<u>Task II</u>												
a. Attend BWIP Design Workshop									==	---		
b. Prepare Trip Report										-----		
c. Meetings with NRC							---				---	

PROJECTED -----
 ACTUAL -----