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DEC 12 1985

Dr. Donald H. Alexander
 Acting Chief
 Technology Branch, RW-23.2
 Office of Geologic Repositories
 U. S. Department of Energy
 1000 Independence Avenue
 Washington, DC 20585

SUBJECT: ADDITIONAL NRC COMMENTS ON LEVEL OF DETAIL IN SECTION 8.3 OF THE DOE SITE CHARACTERIZATION PLAN

Dear Dr. Alexander:

The U. S. Nuclear Regulatory Commission (NRC) and U. S. Department of Energy (DOE) conducted a technical meeting on October 29-30, 1985, to discuss section 8.3 of the DOE Site Characterization Plans (SCP). DOE presented their "Content Requirements for Descriptions of Studies in Chapter 8 of the SCP (referred to in this letter as "Content Requirements") and three examples of study descriptions prepared by each of the three DOE projects using the "Content Requirements" as a guide. During the meeting NRC provided some preliminary comments on the DOE material documented in the meeting summary (Enclosure 1) and agreed to provide DOE with additional comments on the appropriate level of detail in section 8.3 and the application of performance goals and confidence levels in the examples. Subsequent to the meeting DOE developed definitions of terms as requested by NRC in item number 2 of the meeting summary; these were also given to NRC for review in a November 8, 1985 letter from D. Alexander to J. Linehan. As agreed to in item number 4 of Enclosure 1, DOE and NRC further discussed during the December 4-5, 1985 meeting on quality assurance, the quality assurance information to be submitted or referenced in the SCP. NRC comments are documented in the minutes of this meeting.

This letter provides DOE with the results of NRC's review by giving the following additional comments:

Level of Detail in the SCP

The comments below conclude that rigorous use of the revised "Content Requirements" (Enclosure 2) will likely result in study plans with the

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(encl.1) Mtg. of 10/29-30 is already in the PDR

We believe that the quality, completeness, and consistency of the SCP's will be significantly improved by the guidance DOE is developing in conjunction with NRC's review and comment. While we have noted where we consider improvements are needed, the process of DOE/NRC interaction on this subject has been appropriate and constructive. If you have any questions regarding our comments please contact R. Johnson at 427-4674.

Sincerely,

"ORIGINAL SIGNED BY"

John J. Linehan, Section Leader
Repository Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosures:

1. Summary of NRC/DOE meeting on the SCP's Section 8.3
2. NRC Mark-up of DOE "Content Requirements for Descriptions of Studies in Chapter 8 of the SCP."
3. NRC Evaluations of DOE Project Examples of Study Plans

OFC	:WMRP:rs	:WMEG	:WMRP	:WMGT	:WMRP	:WMRP
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DATE	:12/12/85	:12/12/85	:12/12/85	:12/12/85	:12/12/85	:12/12/85

Enclosure 2: NRC Markup of

DOE CONTENT REQUIREMENTS FOR DESCRIPTIONS OF STUDIES IN CHAPTER 8 OF THE SCP

The following outline describes the information that will be provided in the SCP with regard to the plans for studies given in Section 8.3.1 through 8.3.4. A study may involve a single test or a set of tests and analyses, as appropriate. The tests include those measurements of physical parameters, or observations of physical phenomena, that are performed in the field or in the laboratory. Test activities include preparation of procedures, test set-up, conduct of the test, data acquisition and data reduction. The analyses referred to include those calculations or other evaluations needed to establish site characteristics and support design activities. Those analyses to address performance issues are not described in Section 8.3.1 through 8.3.4, but are described in Section 8.3.5.

The items listed in the outline will be addressed for studies, tests, and analyses to the extent that each item applies. Not all items will be applicable in all studies. Furthermore, judgment will be used in deciding at what specific location in Chapter 8 each of the items can best be addressed.

I. Purpose and Objectives

- A. Describe the information that will be obtained in this study. Briefly discuss how this information will be used to resolve issues.
- B. Provide the rationale and justification for the information to be obtained by the study. It can be justified by ① a performance goal and a confidence level in that goal (developed via the performance allocation process and results that will be described elsewhere in the SCP), ② a design goal and a confidence level in that goal (design goals beyond those related to performance issues) and/or ③ a direct federal, state, and other regulatory requirements for specific studies. Where relevant performance or design goals actually apply at a higher level than the study (e.g., where the goals apply to a group of studies), describe the relationship between this study and that higher level goal.

II. Rationale for Selected Study

- A. Describe the constraints (limits) that exist for the study, and explain how these constraints affect selection of test methods and analytical approaches. Factors to be considered include:
 1. - Potential impacts on the site from testing
 2. - Whether the study needs to simulate repository conditions
 3. - Required accuracy and precision of parameters to be measured with test instrumentation
 4. - Limits of analytical methods that will use the information from the tests

5. - Capability of analytical methods to support the study
6. - Time required versus times available to complete the study
7. - The scale of phenomena and parameters that need to be studied
(including standard tests)

B. Provide the rationale and justification for the selected tests and analyses. Indicate the alternative test and analysis methods from which they were selected, including options for type of test, instrumentation, data collection and recording and alternative analytic approaches. Describe the advantages and limitations of the various options.

• Insert A

III. Description of Tests and Analyses

exploratory shaft facility elements, repository layout, stratigraphic units, depth, etc.

A. For each type of test:

(relative to items such as

1. Describe the general approach that will be used in the test. Describe the key parameters that will be measured in the test and the experimental conditions under which the test will be conducted. Indicate the number of tests and their locations (spatial location on the site; and where the test is actually performed, such as the exploratory shaft, ground surface, laboratory).

or if a standard procedure is modified

2. Summarize the methods to be used for the test. Reference any standard procedures (e.g., ASTM, API) to be used. If any of the procedures to be used are not standard, summarize the steps of the test, and reference the technical procedures document that will be followed during the test. If procedures are not yet available, indicate when they will be available. Indicate the level of quality assurance that will be applied to the test, A

how it is modified

and reference the applicable specific QA requirements

3. Specify the tolerance, accuracy, and precision required in the test, where appropriate.

4. Indicate the range of expected results of the test and the basis for those expected results.

5. List the equipment required to conduct the test and describe briefly any such equipment that is special.

6. Describe techniques to be used for data reduction and analysis of the results.

7. Discuss the representativeness of the test, and indicate any limitations that will apply to the use of the results.

Also

and uncertainties

including why the test results are considered representative of future conditions or the spatial variability of existing conditions.

• Provide illustrations such as maps and cross sections at various scales to show the locations of tests, schematic layouts of tests, etc.

2

• Relationship of the test to the set performance goals and confidence levels.

Insert A

- Provide the rationale for the number, location, duration, and timing of tests with consideration to various sources of uncertainties (e.g. test method, interference with other tests, and estimated parameter variability). Indicate the alternative numbers, locations, durations and timing considered and describe the advantages and limitations of the various alternatives. (This insert could just as well be under section V Schedule and Milestones.)

Reference the technical procedures document that will be followed during the analysis. If procedures are not yet available, indicate when they will be available. Indicate the level of quality assurance that will be applied to the analysis and reference the applicable specific QA requirements

B. For each type of analysis:

1. State the purpose of the analysis, indicating the testing or design activity being supported. Indicate what conditions or environments will be evaluated and any sensitivity or uncertainty analyses that will be performed. Discuss the relationship of the analysis to the set performance goals and confidence levels.
2. Describe the methods of analysis, including any analytical expressions and numerical models that will be employed.
3. Identify the data requirements of the analysis.
4. Describe the expected output of the analysis.
(e.g. with respect to spatial variability of existing conditions)
5. Describe the representativeness of the analytical approach, ~~and~~ ^{and} indicate any limitations, that will apply to the results.
and any future repository conditions and uncertainties

IV. Application of Results

(i.e. studies, investigations, specific programs, and generic programs),

- A. Briefly discuss where the results from the study will be used for the support of other areas of study, for use in performance assessment, and for use in design.
- B. For the support of other areas of study, refer to other ^{studies, investigations, specific programs and generic programs} ~~investigations~~ which use the information produced in the study described above.
- C. For performance assessment uses, refer to specific performance assessment analyses (described in Section 8.3.5) which will use the information produced from the studies described above, and refer to any use of the results for model validation.
- D. For design uses, refer to, or describe, where the information from the study described above will be used in engineering system design and development, ^{construction equipment design and development.}
(e.g. waste package, underground opening, shafts and seals).

V. Schedule and Milestones

- A. Provide the durations of and interrelationships among the principal activities associated with conducting the study (e.g., preparation of test procedures, test set-ups, testing, data analyses, preparation of reports), and indicate the key milestones, ^{including decision points} associated with the study activities.
- B. Describe the timing of this study relative to other studies and other program activities, for those studies that will affect or be affected by the schedule for completion of the subject study.

(Dates for activities or milestones for the study should not be provided. Only durations and interrelationships will be provided here; schedules will be provided in Section 8.5).

ENCLOSURE 3: NRC Evaluation of DOE Project Examples of Study Plans
 (see "Content Requirements" in Enclosure 2 for key to numbering)

TABLE 1

Example name: NNWSI Thermal Properties

<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
I.			
A.		X	
B.			
1.		X	
2.	X		
3.		X	X
II.			
A.			
1.	X		
2.		X	
3.		X	X
4.	X		
5.	X		
6.	X		
7.		X	X
B.	X		
III. (HEAT CAPACITY TEST: Thermal conductivity Tests and Thermal Expansion Tests)			
A.			
1.		X	X
2.		X	X
3.		X	
4.		X	
5.		X	
6.		X	
7.	X		

TABLE 1

Example name:

<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
III. (Canister Scale Heater)			
A.			
1.	X		
2.	X		
3.	X		
4.	X		
5.	X		
6.	X		
7.	X		
III. (Small-scale Heater Experiment)			
A.			
1.		X	X
2.		X	X
3.	X		
4.	X		
5.		X	
6.		X	
7.	X		
III. (Yucca Mountain Heated Block)			
A.			
1.	X		
2.	X		
3.	X		
4.	X		
5.	X		
6.	X		
7.	X		
B.			
1.	X		
2.	X		
3.	X		
4.	X		
5.	X		

	<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
IV.	A.		X	
	B.	X		
	C.	X		
	D.		X	X
V.	A.	X		
	B.	X		

TABLE 2

Example name: NNWSI Mechanical Properties Investigations

<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
I.			
A.		X	
B.			
1.		X	X
2.	X		
3.		X	X
II.			
A.			
1.	X		
2.	X		
3.		X	X
4.	X		
5.	X		
6.	X		
7.		X	X
B.	X		
III.			
A.			
1.		X	X
2.	X		
3.	X		
4.	X		
5.	X		
6.	X		
7.	X		
B.			
1.	X		
2.	X		
3.	X		
4.	X		
5.	X		

	<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
IV.				
	A.		X	
	B.	X		
	C.	X		
	D.	X		
V.				
	A.		X	X
	B.	X		

TABLE 3

Example name: SRPO Mine-by Test

<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
I.			
A.		X	X
B.			
1.		X	X
2.	X		
3.		X	X
II.			
A.		X	X
1.		X	
2.	X		
3.	X		
4.	X		
5.	X		
6.	X		
7.		X	X
B.		X	
III.			
A.			
1.		X	X
2.		X	X
3.		X	
4.		X	X
5.	X		
6.	X		
7.	X		
B.		X	X
1.		X	X
2.	X		
3.	X		
4.	X		
5.	X		

	<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
IV.				
	A.		X	X
	B.		X	
	C.		X	
	D.	X		
V.				
	A		X	X
	B.		X	X

TABLE 4

Example name: BWIP, Uniform Corrosion Tests

<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
I.			
A.		X	
B.			
1.		X	
2.		X	
3.		X	
II.			
A.			
1.			
2.		X	
3.		X	
4.		X	X
5.		X	X
6.		X	
7.		X	
B.		X	
III.			
A.			
1.		X	X
2.		X	X
3.		X	X
4.	X		
5.		X	
6.		X	X
7.		X	X
B.			
1.		X	X
2.		X	X
3.		X	X
4.		X	X
5.		X	X

	<u>Section</u>	<u>Not Addressed</u>	<u>Addressed</u>	<u>More Info. Needed</u>
IV.				
	A.		X	
	B.		X	
	C.		X	
	D.		X	
V.				
	A		X	X
	B.		X	X

FROM DOE		DATE OF DOCUMENT 11/8/85	DATE RECEIVED 11/19/85	NO 1
		LTR XX	MEMO	REPORT
TO JLinehan		ORIG.	CC <i>WMLP:XX</i>	OTHER <i>one 12/6</i>
		ACTION NECESSARY <input checked="" type="checkbox"/>	CONCURRENCE <input type="checkbox"/>	DATE ANSWERED BY 12/10
		NO ACTION NECESSARY <input type="checkbox"/>	COMMENT <input type="checkbox"/>	
CLASSIF	POST OFFICE	FILE CODE: 109		
	REG. NO.			
DESCRIPTION (Must Be Unclassified) Definitions of terms to be used in NRC review of SECTION 8.3 of SCP		REFERRED TO <i>H Miller 11/10</i>	DATE 11/19	RECEIVED BY
		JLinehan		
ENCLOSURES <i>Closed out by letter to DOE/HQ on 12/12/85.</i>		<i>J CHANSON</i>		
REMARKS				