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Mr. Jefferson O. Neff
Program Manager
U.S. Department of Energy
Salt Repository Project Office
505 King Avenue
Columbus, OH 43201-2693

SUBJECT: NRC RESPONSE TO DOE OBSERVATIONS ON THE NRC/DOE MEETING ON STRUCTURE AND TECTONICS OF THE PALO DURO BASIN

Dear Mr. Neff:

The NRC responses to DOE Observations from the NRC/DOE meeting summary on "Structure and Tectonics of the Palo Duro Basin" are enclosed. If there are any questions, please contact J. Trapp at FTS 427-4545.

Sincerely,

ORIGINAL SIGNED BY

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

Enclosure:

NRC responses to DOE observations from the "Structure and Tectonics of the Palo Duro Basin" meeting

cc: T. Verma, NRC
A. Avel, SRPO
M. Ferrigan, SRPO

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NRC RESPONSE TO DOE OBSERVATIONS FROM THE "STRUCTURE
AND TECTONICS OF THE PALO DURO BASIN" MEETING

OBSERVATION

The DOE had the following observations:

1. A common data base has been available to all SRP investigators for use in structural and stratigraphic interpretation; each study has utilized selected portions of the data base. The regional nature of the currently available borehole information and seismic surveys permit conflicting structural interpretations.

Response:

The NRC appreciates that the nature of the available data permits conflicting structural interpretations. As the NRC Staff pointed out in its Observation, 1 however, the data itself is subject to interpretation and, as such, may compound subsequent variations in the interpretation of structural features.

2. SRP recognizes a need to develop a uniform approach to evaluation and interpretation of geotechnical data (i.e., criteria for (1) picking formation "tops" from geophysical logs, (2) picking faults on Palo Duro seismic sections, (3) assigning geologic horizons to seismic data, and (4) "time to depth" conversions.)

Response:

NRC identified the need for this and discussed it in terms of a viable QA program in its Observation 5. NRC recognizes SRP's desire for a uniform approach to data interpretation. NRC notes, however, that a uniform approach to data interpretation is fundamentally different from a uniform approach to the interpretation of structural features resulting from the data (see item 1 above). While both are needed NRC wishes to emphasize that the ability to be able to trace back to the development of interpretations of structural features may be more important than a uniform approach to data interpretation.

3. It is important to obtain seismic data optimized for both basement structure and shallow structures (repository horizon and above). These two needs lead to conflicting requirements for data acquisition parameters if a single seismic survey for deep and shallow data.

Response:

The NRC agrees with DOE and made a similar observation in its Observation 6a.

4. The exploration geophysics industry (particularly seismic), is needed by the program because of their expertise, capital equipment, and software. However, the industry's procedures and software are largely proprietary and do not fully comply with the program's general requirements for QA. Nor can the industry be expected to comply by revealing their proprietary programs. Some agreement between NRC and SRP is desirable prior to site characterization activities to identify the acceptable applications of industry data.

Response:

The NRC has procedures that allow the handling of proprietary information. It is our understanding that DOE has similar procedures. The NRC agrees that some agreement may be necessary and our geotechnical staff has discussed this concern with our QA staff. (See agreement/open item #2).

5. The uncertainty in structural maps should be explicitly stated rather than relying solely on the indicated distribution of data points to suggest areas of greater or lesser control.

Response:

NRC agrees that, in general, interpretation uncertainties should be explicitly stated. In this way not only can uncertainties be clearly identified, but site characterization activities can then be more readily focused in an effort to resolve those uncertainties considered to be most important to waste isolation.

6. DOE needs to resolve the level of detail needed in structural tectonic models necessary at different phases prior to pre-licensing studies. Specifically, the interpretation of structures within the tectonic framework and the evaluation of performance objectives must be related to uncertainties inherent in the model.

Response:

The NRC agrees. See NRC Observations 4 and 8.

7. There is a need to clearly define the implications to site performance of tectonism during various geologic periods.

Response:

The NRC agrees and made a similar observation in its observation 4f.

8. Site studies require integration to achieve consistent conceptual models of geology, structure, and hydrology (e.g., structural control of geomorphic processes and depositional patterns, and interrelationship of the geologic framework to hydrogeologic processes).

Response:

NRC agrees that interpretations in hydrogeology and rock mechanics, for example, are limited by uncertainties in other areas (e.g. structural geology). Since these interpretations are so interrelated, site characterization activities should be conducted in such a manner as to maximize and prioritize the information that might pertain to the further development of the various conceptual models. The development of issue and information hierarchies and the allocation of performance to the various components, both natural and engineered, should assist in this process.

9. Available remote sensing data have not been utilized and completely evaluated.

Response:

The NRC agrees and made a similar observation in its Observation 3.

10. This meeting demonstrates the desirability of early technical interchanges between DOE and NRC to discuss existing data and uncertainties in interpretations. Such discussions are valuable to expedite the later review of the SCP.

Response:

The NRC agrees totally with this observation as it is a portion of the basis upon which NRC requested the meeting.

11. It was noted that relatively little information exists concerning the Dockum Formation across the entire panhandle. Some approaches to enhancing our understanding of this unit include geological and structural mapping in areas of exposure (e.g., Canadian River Valley), and shallow reflection/refraction seismic surveys.

Response:

The NRC agrees with this observation.

12. With the exception of Fracture Identification Logs, joint information is currently restricted to the periphery of the Southern High Plains. Considerable discussion centered on the implication and meaning of Fracture Identification Logs relative to regional structural interpretations. The nature of the data sets does not permit unambiguous conclusions.

Response:

The NRC agrees with this observation and made a similar observation in its Observation 4d.