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for attachments*

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OCT 21 1983

Mr. Jeff O. Neff, Program Manager
NWTs Program Office
Department of Energy
505 King Avenue
Columbus, Ohio 43201

SUBJECT: NRC STAFF COMMENTS ON THE DOE SALT REPOSITORY PROJECT
INFORMATION MANAGEMENT AND TRANSFER SYSTEM

- REFERENCES:
1. Letter from Neff to Miller, Technical Data Management System (TDMS) for the Salt Repository Project, July 19, 1983.
 2. Letter from Neff to Miller, Implementation of State Working Group Recommendations Relative to the Salt Repository Project, July 19, 1983.
 3. Letter from Chase to Neff, Request for a Salt Project Summary of the Type and Amount of Data Available and in Process, May 13, 1983.
 4. Letter from Neff to Chase, Phone Call to Discuss Data Availability, June 2, 1983.
 5. Teknekron Research, Inc., "User's Manual for the Prototype Earth Sciences Data Base", prepared for U.S. Nuclear Regulatory Commission, July 29, 1983.

Dear Mr. Neff:

In Reference 1 and in the meeting between DOE, NRC and the four states on July 19-20 you asked NRC to comment on the proposed DOE Information Management and Transfer System for the Salt Repository Project described in References 1 and 2. This letter and Attachment 1 contain the comments and related background prepared by the NRC staff. Many of these comments were given verbally to DOE/ONWI by Robert Johnson on September 20, 1983 in a meeting among DOE, NRC, and the four salt states. We understand from new information provided in this meeting that progress has been made regarding some of our attached comments.

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I have enclosed for your information a copy of a recently released NRC contractor report which describes an experimental, numerical data base for BWIP site data (Reference 5 and Attachment 3). We are not asking for comments on this report, and we are not suggesting that this is the way the TDMS should be designed. Rather, we thought this report might be of interest to those designing the TDMS since it illustrates how our contractors have designed a similar data base. Presently, NRC does not plan on developing such a data base for the salt project.

The NRC staff is very interested in the future development of the DOE Information Management and Transfer System. We also want to further develop our NRC system while considering the capabilities of your evolving DOE system.

If you have any questions regarding our review comments please call Robert Johnson (FTS, 427-4676).

"ORIGINAL SIGNED BY"

Hubert J. Miller, Chief
Repository Projects Branch
Division of Waste Management

Attachment: 1, 2, and 3

*Record Note: See following page.

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12. Major and selected comments given verbally to DOE/ONWI in a meeting on 9/20/83 in Columbus, Ohio. Many comments discussed and DOE feedback obtained.
13. Copies of the fourth response were sent to Treby, Vouglar, Rutberg of ELD on 10/5/83 for their information.

14. P.S. Justus's concurrence signifies cognizance of the purpose and intent of this letter review. He is in agreement with the basic tenets. However, detailed review of this concurrence copy wording was not performed. Agreement is based mainly on detailed review of early draft. *P. Justus*

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 Mr. de Hoff from Miller
 10/21/93

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DETAILED NRC STAFF COMMENTS REGARDING THE
 PROPOSED DOE/ONWI SALT INFORMATION
 MANAGEMENT AND TRANSFER SYSTEM

The NRC staff reviewed the DOE/ONWI Information Management and Transfer System described in References 1 and 2. The specific comments below are aimed at the following primary question:

Is the DOE policy and system for information access, management, and transfer adequate to support both prelicensing and licensing information needs?

This question is answered by the specific comments on the following elements, which the NRC staff believe are critical elements of an information management and transfer system.

1. System description
2. Type and format of information available
3. Timely availability of information
4. Information storage and control
5. Information access through searches
6. Information traceability
7. Information transfer to users
8. Observation of studies
9. Technical meetings and staff discussions

During prelicensing the most important aspects of an information system should be 1) prompt availability of the results of all data collection (raw data), 2) complete documentation of investigation plans and results, 3) timely release of data and analysis reports and plans, and 4) efficient access to information using a variety of search mechanisms. As licensing activities begin, the importance of long-term information storage and control as well as rapid search and retrieval increases.

1. System Description

- a. References 1 and 2 are a good beginning at defining both policy and system capabilities; however, much more comprehensive and detailed descriptions of the design features and functional capability of the system are needed for a user to adequately assess whether the proposed system will satisfy the prelicensing and licensing needs. While many of the following comments identify weak areas in the system description, these comments are limited to some extent by the lack of detail

in the proposed system description distributed for review (References 1 and 2). It is clear from discussions with DOE and ONWI staff that many good ideas are either being implemented or are planned for the future, but many of these are not documented.

- b. The proposed system description includes separate descriptions of the Technical Data Management System (TDMS) (Reference 1) and the Catalogue (Reference 2). These two elements and their subelements should be integrated into one system description with the relationship between all elements more clearly defined. Furthermore, the relationship between the policy statements in the Catalogue and implementation aspects of the system could be made clearer by a more integrated description, possibly supported by some diagrams.
- c. The proposed system appears to primarily respond to the relatively short-term, prelicensing needs of the NRC, States, Tribes and public; therefore, the proposed system can be viewed as a prelicensing information system. While these needs are most immediate and clearly very important to licensing, the specific and unique needs of licensing should be considered further. While an adequate prelicensing system should ideally serve licensing, there may be features of the system which can be developed to serve licensing more efficiently. The system ideally suited for licensing may not be the same in all respects as that needed to serve prelicensing. For example, during the discovery period and during hearings, many specific information requests are anticipated requiring rapid search/retrieval/transfer capability. Therefore, the NRC staff suggests that the unique needs of licensing be identified and appropriate system modifications developed to meet these needs. The general objectives and capabilities of such a future system should be described.

2. Type and Format of Information Available

- a. A primary objective of a prelicensing/licensing information system should be providing access to all types and forms of information. While we completely support the general DOE policies of making data and analysis reports, and plans/procedures available, it is not clear that the Catalogue, Records Information System (RIS), or TDMS

contains all the information available and needed. The complete contents encompassed by the proposed Catalogue, RIS, and TDMS should be identified in detail. Specific comments follow.

- b. The NRC needs with respect to prompt availability of raw data are:
 - i. to observe the results of data collection both during and after collection
 - ii. to obtain the results of data collection promptly after the DOE quality assurance checks that are inherent in determining that the data has been obtained and documented properly have been made.

These two needs only pertain to selected results requested by NRC.

Procedure number 1 of Reference 2 addresses providing data reports in 30-45 days of collection. While this procedure is useful (see 1.b below) an additional procedure/policy statement is needed for release of raw data. From discussions with you and Robert Johnson in a meeting on September 20, we understand that the intent of procedure number 2 is to also allow observation of raw data. For clarity and completeness, we suggest that procedure number 1 should have the following statement added: "Raw data resulting from all data collection activities (field and laboratory) can be observed both during and after collection. This raw data will be made available upon request for inspection and copying promptly after the DOE (or DOE contractor) quality assurance checks that are inherent in determining that the data has been obtained and documented properly have been made."

This revision pertains only to the raw data in the form they were collected; it does not include the data in a compiled form accompanied by descriptive information about the data collection activities. Also, availability means access for inspection and/or copying but not formal release and distribution by DOE to all interested parties.

- c. The proposed data reports described in procedure number 1 of Reference 2 are useful but should be an additional mechanism for release and distribution of results separate from the raw data referred to in 1.a. above. Detailed descriptions of the contents of data reports were not given and should be defined and standardized to the extent practicable. In general these reports should provide the raw data and any information pertinent to understanding the quality of the data. Specifically, they should contain such items as 1) raw data records or reference to these if they cannot be reproduced, 2) compiled data, 3) test plans and procedures used, 4) actual conditions under which data were collected, handled, and stored, 5) limitations and uncertainties, and 6) QA/QC procedures followed.
- d. The format for presenting data in the data reports should be clearly specified. The format should be flexible to the extent practicable so that items such as geologic or geophysical logs, maps, and cross sections are provided at a size and scale which can be fully used by reviewers. Generalizing or reducing such items of information to a 8½ x 11 page size often results in an unsatisfactory product requiring follow-up requests for the full size/scale item.
- e. Consideration should be given to using the RIS or TDMS to enhance the accessibility to the data documented in data reports. Data would include items such as original geophysical logs, field maps and cross sections, field and laboratory notebooks, aerial photographs, cores and other samples. The intent here is to have the existence of all data entered into a computer searchable system to facilitate access.
- f. NRC requested that DOE provide a summary or inventory of the type and amount of available data referred to in 1.e. above (Reference 3). Clearly, such an inventory is important to identifying the material supporting the DOE data reports as well as the preferred data in the TDMS. As part of the proposed TDMS system, DOE developed borehole summary sheets which provide the type of inventory described above. It should be clear that the intent of NRC's letter (Reference 3) was that all existing data be inventoried in such a manner - not just borehole data.

- g. It is not clear in the proposed system how data obtained by DOE from other sources (e.g. geophysical logs or purchased seismic reflection data) would be entered into the system. These data should be treated in the same way as data collected directly by DOE. Proprietary data might be an exception, but NRC has provisions for using proprietary information.
- h. The planned content, production and release of analysis reports were not described in sufficient detail. Analysis reports should be developed in a standardized manner similar to the suggestions made in l.b. for data reports.
- i. It appears that the proposed system does not include QA/QC records. Consideration should be given to providing access to QA/QC records using the RIS system.
- j. The terms "activity plans", "test plans", and "test procedures" should be defined and contents described.
- k. The contents of the RIS and the extent of open access to all its contents need clarification. It appears to contain only DOE/ONWI reports together with all DOE/ONWI correspondence, incoming/outgoing and internal/external. All reports referenced by the DOE/ONWI reports should be also included in the RIS. This would greatly facilitate complete traceability and retrievability of information to all supporting information, including non-DOE sources. Many of these reports otherwise may be difficult and time consuming to obtain.

It was not clear if all correspondences are available upon request. The discovery process during licensing includes access to all correspondence, internal and external.

- l. For prelicensing the computer use of the proposed system could be increased. The computer data base (TDMS) provides access to "best" values and the RIS performs bibliographic searches, but information requests and transfer are not done using the computer. Further, an information management system with greater computer use should be considered for the longer-term licensing needs in order to provide more immediate and complete information access using the computer and terminal. For example, this might include entering complete reports on

the system. Advancing technology in digitizing whole texts (including figures) together with whole text search capability could make this option attractive when the technology becomes available.

- m. The NRC staff has several comments on the TDMS as described in Reference 1.
 - i. The TDMS would contain "preferred" or "best" values for parameters important to repository performance assessments. Many of the parameters are laboratory or field determined values for which the use of a single value is questionable. While the use of "best" values might lead to the consistent consideration of the best fit case, they would discourage proper identification and consideration of the uncertainties related to each parameter. The TDMS description does not discuss any approach for treating uncertainties. An approach is needed and should consider including averages, ranges, and probability distributions where available. Additional entries might also give estimated conservative and realistic bounds for the measured data as well as estimated parameter values and distributions (uncertainties) for parts of the natural and engineered system lacking measured data. Clear distinctions should be made between measured and estimated parameter values.
 - ii. The TDMS description is unclear with respect to documenting support justification for the "preferred" values. Supporting justification and complete traceability to sources is absolutely necessary. Support should include the data and analysis reports, criteria and justifications used for selecting values, and an extended data base of the existing individual data points considered. This extended data base would support the "preferred data base" and would make all the values for selected parameters accessible using the computer. Often, the data that are questionable or vary greatly from the "best or preferred data" are indicators of hidden characteristics at a site. From a licensing standpoint, all data must be considered.

It is important that an extended data base contain qualifiers along with each value. Raw values alone without any information reflecting on the quality of the values can lead to misuse of the data. Therefore appropriate qualifiers such as type of test method, type of analysis methods, error, spatial distribution and references must be included. Reference No. 5 (Attachment 3) gives an example of how this was done in the NRC Prototype Earth Sciences Data Base.

NRC contractors have over the past year developed a numerically oriented data base for the BWIP Site related data (Reference 5). This project began with the "preferred" values approach but evolved into entering all values for selected parameters important to site performance. This project was initially restricted to 100 reports with data on the BWIP Site. About half of these references contained earth sciences data that were entered into the data base. A total of some 30,000 measurement values totaling some 3 million characters were excerpted from these reports. DOE's description of the Catalogue and Procedures for Requesting Information infers that DOE has catalogued some 11,000 reports related to salt sites. If the amount of data scales linearly with the number of documents, it is possible that computerization of all data may not be feasible.

Furthermore, it may not be necessary to have all parameters in a computer data base. An extended data base for selected, critical parameters might be a reasonable solution. Other data for non-critical parameters would be available in various referenced data and analysis reports. DOE should consider the alternative described above in further developing the TDMS.

- iii. The procedure for controlling changes to the TDMS should be described in more detail. The NRC staff agrees with such a control and views it as part of the QA/QC process.

3. Timely Availability of Information

- a. The approach of producing data reports separate from analysis reports will improve timely access to primary data. The NRC staff agrees that the data reports should contain unprocessed, unanalyzed and unevaluated data so that truly primary data is documented and available. See comment 2b for further discussion.

Another important consideration affecting timely release, which was not addressed, is defining the scope of both data and analysis reports. If many tests or analyses are grouped over a long period of time access would be hindered. Therefore, a commitment is needed to carefully identify discrete data and analysis packages which can be rapidly released but at the same time not harmfully fragmenting the data collection or analysis documentation.

- b. The policy and procedure regarding release of plans and procedures should consider including a commitment to release plans well enough in advance of the work so that reviews by NRC or the States can be done and any changes identified and agreed to can be incorporated. This is consistent with the DOE/NRC Procedural Agreement (No. 2.d). A procedure should be added to list the plans and procedures which are being developed in the Catalogue. This listing should include the anticipated completion date of the plans and procedures as well as the anticipated date for starting work.

4. Information Storage, Control, and Retention Times

- a. Long-term storage and control of all types of information was not addressed and should be. Since licensing regarding the construction authorization will not begin for a number of years and since the subsequent licensing stages will extend beyond 20 years into the future, special attention should be given to procedures which will store and control accessibility to information indefinitely. This concern is a good example of the need to tie various QA/QC procedures to this system description.

A centralized information storage system would be advantageous since studies are done by contractors, subcontractors, and consultants located in different parts of the country. For example, field and lab notebooks left

under the control of the subcontractors responsible for the work may not be retrievable. These notebooks or copies should be transferred to DOE.

- b. Long-term storage and control of all types of samples (e.g. rock core, water samples, etc.) were not addressed. Policies and procedures should be stated or referenced if they already are available (e.g. core storage facilities and procedures).
- c. The proposed system does not address QA records. QA records should be stored and available along with all the other project information to the extent practicable (core may be one example of an exception).

5. Information Access Through Searches

- a. The DOE procedure for requesting searches in writing and for producing indexes could be greatly enhanced by also allowing direct terminal access and on-line searches by NRC and State personnel.
- b. The proposed system should describe in detail the search capabilities of RIS and TDMS. A users manual should be referenced and made available to potential users (see 5.a.). A complete listing of the Work Breakdown Structure (WBS) is needed instead of the WBS listing in ONWI-200 which gives only upper-level categories. Likewise, reports should be indexed by all of the appropriate finest level WBS numbers.
- c. The keyword search capability should be completely described. Also, a justification is needed for using the free-text search approach without a controlled language (thesaurus) for technical terms. While the free-text search capability is appealing, the NRC staff is concerned about consistent and accurate use of technical terms in the report abstracts and titles. It seems that search accuracy and completeness might be diminished by preparing titles and abstracts (those items searched) without the aid of a controlled language (thesaurus or keyword list).
- d. As already mentioned in comment 2, consideration should be given to selected use of whole-text storage on the computer: One search advantage to this system is the

direct read-in of text to the system thus avoiding human errors due to terminal entry of titles and abstracts. Such a thorough search method would complement a keyword search capability. Also, having the complete text on-line would greatly facilitate rapid scanning and retrieval by print-out of the selected parts of reports.

- e. Reformatting the bibliography of studies (ONWI-200(1)) could improve simple searches using this document. Consideration should be given to displaying the complete document citation and abstract by ONWI report number. Then, the WBS numbers could be listed along with each applicable report number. Using the present format abstracts for reports are difficult to locate unless the WBS number is known. Also, it seems possible that one report might relate to more than one WBS number.
- f. A data summary (inventory of the types and amount of data available) is an essential search tool to assist any party in selecting and requesting data. See comment 2.c. for further discussion. Such an inventory should be updated periodically and made available just as ONWI-200 and the TDMS handbook are planned to be updated and distributed.

6. Information Traceability

- a. The process for providing complete traceability for any item within the system was not described and should be. For example, data reports must refer to raw data and literature sources if it is not attached to the report. Analysis reports must refer to data reports and other literature sources. TDMS values must refer to reports documenting the basis for selecting preferred values as well as all other supporting analysis and data reports. These preferred value selection reports must refer to analysis and data reports.

7. Information Transfer to Users

- a. It was not clear if the Technical Profile Selection Sheet pertained to all types of released information (data reports, analysis reports, plans, procedures, etc.)

- b. As mentioned in 5.a. direct terminal searches by non-DOE/ONWI users is desirable.
- c. The longer-range system for licensing should consider as much direct use of the computer to transfer data as possible. Discovery searches and selective retrieval during the preparation for licensing hearings and during hearings could be greatly facilitated by direct and complete computer/terminal use. See comments 1.k. and 5a.

8. Observation of Studies

- a. Procedure number 2 described in Reference 2 for access to drill sites appears to be restricted to "drill sites" and "when holes are drilled". This policy should be broadened to include access to all field and laboratory data collection activities. Access would include making the data being collected available for observation and copying upon request as stated above in comment 2.6.
- b. To facilitate planning visits to observe DOE studies, a schedule of future studies should be continuously maintained and made available to the NRC and States.

9. Technical Meetings and Staff Discussions

- a. For completeness, the policies and procedures for conducting technical meetings between NRC and DOE should be described or appropriate agreements referenced. Meetings and workshops are considered by the NRC staff to be a vital element of an information transfer system.
- b. As proposed in the minutes of the NRC/DOE meeting of June 27-28, (Section 10.b.) and the NRC draft site specific agreement (Attachment 2), DOE should consider establishing technical contacts within the DOE staff to facilitate technical discussions, clarifications and exchanges of information with technical contacts on the NRC staff.