

M S/F

DFehringer
MKnapp

WMHT R/F

NMSS R/F

CF

REBrowning

HJMiller

MBell

JBunting

PAltomare

PJustus

JGreeves

RJohnson & R/F

PDR /LPDR/S,

SCoplan

RWright

SEP 15 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. This letter and its attachment contain the comments and related background prepared by the NRC staff.

BACKGROUND

1. DOE/ONWI Proposed System

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NAME	: RJohnson: kg :	SMCoplan :	RJWright :	PSJustus :	JTGreeves :	DFehringer :	MKnapp
DATE	: 8/ /83 :	8/ /83 :	8/ /83 :	8/ /83 :	8/ /83 :	8/ /83 :	8/ /83

Consultation with DOE on licensing information needs involves discussions with DOE investigators on the content and sufficiency of their existing program, data, analysis, performance assessments and related plans.

At a minimum, the NRC staff needs with respect to fact gathering and consultation are defined in the DOE/NRC Procedural Agreement. To the extent necessary more specific needs will be identified in site specific agreements. The comments on the DOE proposed information system given below and attached, represent NRC staff recommendation. As we have noted in the comments some are considered very important while others are suggestions or ideas for consideration.

The proposed DOE system represents a good beginning to the establishment of a vital element of the precicensing and licensing phases of salt repository development. It appears that the proposed system, with revision, will be responsive to setting up policy and procedures for the DOE information transfer which was called for in the DOE/NRC Procedural Agreement of June 29, 1983. It is also responsive to the NRC letter to DOE requesting a summary of the salt data base (Reference 3).

Finally, we recognize that it will take time to fully implement the DOE proposed system and revisions to it based on comments. In the interim the system you are implementing together with the provisions

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With the above understanding our major comments are given below; more specific comments are attached.

1. Timely Availability of Data Collection Results

- [illegible]

2. Technical Data Base:

- This extended data base would support the "preferred data base" and would make all the values for selected parameters accessible using the computer. 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 analyses method, uncertainty, and references must be included. Reference No. 5 describes how this was done in the NRC Prototype Earth Sciences Data Base.

The policy for access to drill sites stated in the Catalogue is 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 also include observing the data being collected.

As proposed in the minutes of the NRC/DOE meeting of June 27-28 (Section 10.b), DOE should consider establishing technical contacts

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within their staff to facilitate technical discussions and exchanges of information with NRC technical contacts.

I have enclosed for your information a copy of an NRC contractor report which describes an experimental data base for BWIP site data (Reference 5).

The NRC staff is very interested in the future development of the DOE Information Management and Transfer System. We also want to coordinate our efforts to set up an NRC system in conjunction with your evolving DOE system.

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

**Hubert J. Miller, Chief
High-Level Waste Technical
Development Branch
Division of Waste Management**

Attachment 1:
As stated

***Record Note: See following page.**

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RECORD NOTE

1. Memo sent on 8/2/83 asking for attendance at kickoff meeting and review comments on the ONWI proposed system from Bell, Bunting, Boyle, Knapp, Cook, Fehringer, Justus, Greeves, Johnson, Surmeier, Still, Scattolini, Rutberg, Vougler, Costanzi, Wright and Coplan.
2. Johnson held a kickoff meeting on 8/2/83 to summarize the ONWI proposed system and define review approach and 8/8/83 due date. Bunting, Regnier, Fehringer, Surmeier, Mattson, Still, Scattolini, Rutberg, Vougler, Wright, Coplan, Corrado, and Teknekron representative. Copies of the ONWI proposed system were distributed. Some verbal comments received.
3. Written comments on the ONWI proposed system were received from Rutberg, Vougler, Teknekron, and Geotrans and verbal comments were received from Scattolini, Coplan and Wright by 8/8/83.
4. Johnson prepared first response based on all comments received and distributed on 8/25/83 for concurrence to Coplan, Wright, Justus, Greeves, Fehringer, Knapp, Boyle, Surmeier, Mattson, Bell, Bunting and Miller. Copy also given to Rhoderick, and Still for review.
5. By 8/26/83 comments on first response were received from Justus, Coplan, Still, Rhoderick, Fehringer, Weber, and Mattson, Bunting, Surmeier, and Wright.
6. Johnson addressed comments and prepared second response on 8/30/83 based on 8/26/83 comments.
7. Additional comments on first response received by 8/31/83 from Miller, Wright, Bunting and Surmeier. No comments received from Bell, Knapp, Cook, Greeves and Boyle.
8. Johnson addressed 8/31 comments and prepared third response on 9/14/83.
9. Comments on first response received on 9/14/83 from Hartung for Greeves and Regnier for Boyle.
10. Comments on third response received from Miller on 9/14/83.

11. Johnson prepared fourth response on 9/15/83 to resolve Miller's 9/14 comments. The fourth response transmitted to Miller.

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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. Transfer of information to users
8. Observing studies
9. Technical meetings and staff discussions

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

1. System Description

- a. References 1 and 2 give a good start 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 com-

ments 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).

- 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 should be integrated into one system description with the relationship between each more clearly defined. Furthermore, the relationship between the policy. 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 be primarily responding to the relatively short-term, prelicensing needs of the NRC, States, 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 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 a future licensing system developed. 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, analysis results, and plans/procedures available it is not clear that the Catalogue, Records Information System (RIS), or TDMS contains entries for 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 30-45 day release time proposed for data reports is inconsistent with the DOE/NRC Procedural Agreement (No. 3.a) which states "Data collected during site investigations will be made available to NRC on a current, continuing basis after the DOE (or DOE contractor) quality assurance checks that are inherent in determining that the data has been obtained and documented properly." A commitment is needed in the proposed DOE/ONWI system to make the results of all data collection activities immediately available after collection and basic QA/QC checks have been done. This pertains to only the 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 observation and/or copying but not formal release and distribution by DOE to all interested parties.
- c. The proposed data reports are needed 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 transferring data in the data reports should be clearly specified. The format should be flexible to the extent practicable so that such items as logs, maps, and cross sections are provided at a size and scale which can be fully used by reviewers. In many cases generalizing or reducing such items of information to a 8½ x 11 page size 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 access to the raw data documented in data reports. Raw 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. Obviously the raw data itself (e.g. cores) cannot be entered, but the existence and availability of the raw data must be known for most efficient 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 such 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. This data should be treated in the same way as data collected directly by DOE.
- h. The content, production and release of analysis reports was not described in sufficient detail. Analysis reports should be developed in a standardized manner similar to the suggestions made in 1.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 needs clarification. It appears to contain only DOE/ONWI reports together with all their correspondence,

incoming/outgoing and internal/external. All reports referenced by the DOE/ONWI reports should be also included. This would greatly facilitate complete traceability and retrievability of information to all supporting information, including non-DOE sources. Many of these reports may be difficult and time consuming to obtain.

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

1. The computer use of the proposed system is relatively minor. 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. 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 makes this option attractive when the technology becomes available. Such an approach could be used for all reports or selected reports.
- m. It appears that DOE intends the TDMS to be a coordinated or common data base for all parties to use in their assessments. The NRC staff agrees with this objective, but has several comments on the TDMS as described.
 - 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.

- ii. The TDMS description is unclear with respect to documented support 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, uncertainty, spatial distribution and references must be included. Reference No. 5 describes 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 in the TDMS should be described in 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 agree 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 releasing plans well enough in advance of the work so that reviews by NRC or the States can be done and any changes indentified 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 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 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 so many 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.) was 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 at a single facility 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 producing indexes and requesting searches in writing 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). While the free-text search capability is appealing, the NRC staff is concerned about consistent and accurate use of 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.
- 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.

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. These preferred value selection reports must refer to analysis and data reports. The NRC Prototype Earthsciences Data Base (Reference No. 5) was designed to include traceability and is an example of what is needed.

7. Transfer of Information 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. Observing Studies

- a. The policy for access to drill sites stated in the Catalogue is 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.
- 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.), DOE should consider establishing technical contacts within their staff to facilitate technical discussions and exchanges of information with NRC technical contacts. Also, the role of the NRC resident representative with respect to prompt information exchange should be recognized and described.