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Job Justus of
April 7, 1985

MEMORANDUM: Robert E. Browning, Director
Division of Waste Management

FROM: F. Robert Cook, Senior On-Site Licensing
Representative, Basalt Waste Isolation
Project (BWIP)

SUBJECT: OBSERVATIONS, COMMENTS AND RECOMMENDATIONS
FOR THE PERIOD FEBRUARY 22, THROUGH MARCH 28,
1986

TECHNICAL ITEMS

1. Waste Package--

a. DOE requested information from RHO concerning completion of various prerequisite for work on waste package research and development, as well as other areas of design for a repository, per a letter to the General Manager, RHO, from O. L. Olson, Attachment A. The letter addresses new work and ongoing work. I will report on the outcome of RHO's evaluations, their recommendations and DOE's actions in my next report, if DOE makes this information available to me.

b. A review of the BWIP waste package activities for DOE/RL and the SRPO was scheduled for the Week of March 30, 1985 in conjunction with a similar review of SRPO waste package activities. T. Verma and I expect to attend the review sessions. I will report on the results in my next report.

2. Repository Engineering--

a. I attended the 90% design review of the advanced conceptual repository design noted in my February 28, 1986 memorandum. View graphs provided to me during this review were forwarded to the Staff, Greeves/Buckley by separate correspondence.

b. The most significant aspect of this design review was the results of a sensitivity analysis identifying the importance of the in-situ stress level to the design. The study indicated that a 10% increase in horizontal stress at depth or a 10% decrease in rock strength results in a 38% increase in waste package spacing. On the other hand a 10% decrease in stress or a 10% increase in strength translates into a 19% decrease in spacing.

The changes in spacing effect corresponding volume changes in the repository itself. The cost associated with the volume increase or reduction is great. It appears obvious to me that in-situ stress is a key parameter required to make design and siting decisions. This conclusion was emphasized to me in a discussion with the former BWIP Director, E. Ash, just prior to his retirement in August of last year. This issue was discussed in a RHO letter to DOE recommending additional testing in September and again in another recent letter requesting action on the first letter.

To date it is not clear to me that siting decisions have adequately and objectively considered this parameter and it appears that DOE has in effect tabled the resolution of the issue considering their inaction on the RHO proposals.

Based on knowledge of discing and spalling, both qualitatively indicative of high stresses, and stresses deduced from hydro-fracturing tests, I believe the present location of the RRL is undesirable compared to locations further away from the Cold Creek Syncline axis and the fault which is associated with the hydraulic barrier to the West. Maps which have been prepared by the RHO staff indicating "isostress" contours in various basalt flows based on discing and spalling in cores and boreholes respectively clearly suggest the influence of the geologic structural discontinuities--structures--noted above on the stress pattern.

It is my conclusion that Staff should carefully evaluate the justification for siting the RRL where it is in light of the stress situation noted above in conjunction with review of the final EA's and the site recommendations, if the BWIP site is recommended for characterization.

Pertinent documents dealing with the in-situ stress conditions and RHO recommendations are RHO-BWI-ST-73, RHO Change Requests 528 and 529 of September 23, 1985 and RHO letter Fitch to Olson recently issued requesting action on the two change requests. In addition draft maps referred to above are pertinent, although it is doubtful that DOE would release these items to me.

3. Geology--

a. Seismic events continued to occur in the area south of the RRL, at the location reported in my memorandum of February 28, 1986. The events were reported to be shallow.

b. B. Hurley of DOE's Geosciences Group informed me that he plans to leave DOE and go to work for SAI in Las Vegas.

4. Performance Assessment--

a. The manager of the performance assessment group for RHO, Bob Baca, has been transferred to a defense activity in RHO and will no longer work on BWIP.

5. Geochemistry--

a. I have reviewed activities to determine whether or not any investigations address the geochemistry of selenium. I do not believe that BWIP is assessing the hazards of selenium. However, various isotopes of selenium are produced in the fission process in significant quantities--similar to the quantities of Kr-85 produced. Selenium is not only a hazardous metal, it also presents a relative long half life in the isotope, Se-79. Selenium may have properties similar to S in the geochemical environment and may be relatively mobile.

If staff has not investigated the importance of this element, it may warrant review.

6. Site/Environmental--

a. DOE/RL's defense waste DEIS was recently issued and includes environmental information pertinent to the BWIP site. Its review by staff is recommended. It does not appear that the information concerning contamination of confined aquifers, for example data concerning I-129 levels in the confined aquifers, is reported. In addition the recent release of many documents (19,000 pages) pertaining to releases and levels of radio isotopes does not contain all the information the Staff previously requested concerning levels of radio isotopes in the ground water, on and off the reservation. A list of the documents making up the 19,000 pages was forwarded separately to Staff for their information.

b. The states of Oregon, Washington and the affected Indian tribes have organized a panel to manage the review of the information contained in the recently released documents, noted above. It is expected that it will take a year to review the content of these documents. The review should indicate whether or not releases from Hanford over the years caused degradation of the public health. The review will create a group expert in the radiological environment around Hanford. It would appear prudent

for staff to stay abreast of this review and learn from their activities.

7. Hydrology--

a. RHO has instituted reverse circulation drilling procedures at DC-23 using water as the drilling fluid. The speed of the drilling is significantly increased because of the higher loads on the bits when compared to loads using drilling mud.

b. Procedural control of the operations during hydrologic drilling and testing, including hydrochemical sampling, is gradually becoming a reality as a result of the combined efforts of the RHO Drilling and Testing Group and the Site Analysis Group.

8. Quality Assurance--

a. Activities in the area of QA have drastically increased in the last two months at DOE and the contractors. There are 18 new contractor personnel working directly for DOE under P. Saget, the new manager for DOE/BWIP QA. He reports to the manager BWIP (Olson) which in my opinion does not provide the independence required by 10CFR50 appendix B for the QA organization.

b. During the Week of March 23, 1986 the DOE QA contractor, (MAC) conducted an audit of RHO's auditing program. The audit was observed by D. Hedges and myself. The DOE QA group headed by Saget was very open during this audit and greatly facilitated OR observations. Although the MAC audit team attempted to accomplish a sound audit, it was hampered by not being familiar with the BWIP audit procedures and project personnel performing audit functions. In addition the MAC auditors seemed to audit to NQA-1 requirements instead of the requirements of Appendix B as it applies to repository QA. An example was MAC's review of raw data taken by RHO auditors in performing their audits. There appeared to be no attempt to confirm that raw data supported final audit report findings, and that the raw data appeared credible.

The definition of records considered appropriate by the MAC auditors did not include notes of observations taken on standard forms filled out during the audit per procedure. Such raw data did not appear necessary to MAC personnel to establish credibility of the audit process for future review during licensing. This belief, consequently, limited the raw data from RHO audits that they reviewed to verify audit findings' credibility.

I conclude that the Staff should prepare a comprehensive definition of the term RECORD and include it in the glossary of terms used in the staff technical positions and the QA review

plan. Such a definition is key to the preparation of procedures which typically identify records that must be retained. I consider many of the procedures currently being invoked by BWIP are inadequate in this respect in that they do not require the retention of raw data records.

I consider that the scope of the definition in 10CFR2.4 for NRC records should be incorporated into any prepared definition and that the purpose of the records be contained in the definition. It should be made clear that records and their retention are needed to establish the credibility of all activities, the quality of which can be subject to review during licensing. In particular raw data concerning decision making during design is important to keep.

Such a definition is also needed to establish the scope of the information to be made available for OR review per the agreements of Appendix 7.

MISCELLANEOUS ITEMS

1. In reviewing the definitions recommended in my report of February 28, 1986, I noted a significant mistake in the definition I provided for the term DESIGN. In the part of the definition covering the use of DESIGN as a verb I left out acts which produce research and development data. The definition should be as follows:

The term DESIGN means (1) specifications, plans, drawings, blueprints, and other items of like nature; (2) the information contained therein; or (3) the research and development data pertinent to the information contained therein. When used with reference to an activity or as a verb, DESIGN means, respectively, the activity or act itself as inferred from the context, involved in producing information listed under (1), (2) and (3) herein.

As can be seen from the discussions accompanying the definitions in my February memo, It was my intent to include research and development within the context of the term design.

b. DOE issued a letter, dated March 27, 1986 to RHO formally notifying RHO (and subcontractors via RHO) to comply with Appendix 7 DOE/NRC agreements concerning the On-Site Representatives activities. This letter is Attachment B to this memorandum. Comments which DOE has included in the letter to RHO significantly alter the agreements which were intended by the signers of Appendix 7, based on the language in Appendix 7 and my understanding of the NRC's intent.

My comments on the DOE letter are contained in Attachment C to this memorandum and are in way of justifying the conclusion noted above.

F. Robert Cook, Senior
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Representative, Basalt
Waste Isolation Project
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Attachments A, B and C as stated.

cf:

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JJLinehan

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