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NUCLEAR REGULATORY COMMISSION
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WM Record File 412.4

WM Project
Docket No.
PDR
LPDR

June 3, 1987

Distribution: (Joan ticket)
Galson REB MJB
(Return to WM, 623-SS)

Note to: Dan Galson, WMRP/NMSS

From: Hans Schechter, IP/GPA HBS

Subject: Visits by German WM Delegation and Taiwanese Professor

1. As shown in Attachment A, a six-man German delegation representing DWK and other institutes will be visiting Washington, DC, agencies and field offices and facilities elsewhere from June 10-23.

   Dr. Bernd-Uwe Jahn, Science Counselor at the local German Embassy, asked us to schedule a visit at NRC on June 11 from 9:15-11:45 a.m. Since I will be out of town from June 7-14, I would appreciate your assistance in making all the necessary arrangements for this visit to NMSS. I suggest that you coordinate the details of the visit directly with Dr. Jahn (tel. 298-4330). (Dr. Jahn may also be accompanying the visitors.) Names of visitors and topics of discussion are contained in the attached telefax. Try to provide NRC technical coverage in as many NRC-relevant topics as possible. (Some of the topics may be more properly addressed by DOE or EPA, which they will also be visiting.)

2. Dr. Jung Yeh Si of the National Tsing Hua University wishes to visit NRC on June 12 (letter at attachment B). Dr. Si has already visited NRC once before.

   I suggest setting up a meeting on June 12 from 10:00-11:30 a.m. (please coordinated with RES as necessary) based on the topics in his letter highlighted by me in yellow. Would you also please assemble the DOE papers mentioned by Dr. Si? Also, kindly inform Dr. George K. C. Liu (CCNAA--the local Taiwan representative office) at Tel. 895-1930 ASAP of the arrangements made so that he may notify Dr. Si of the time and venue of the meeting.

   Howard Faulkner (IP) and Hal Bengelsdorf (IEAL in Washington, DC) may wish to take Dr. Si out to lunch. Howard will coordinate on this with you and Bengelsdorf.

Thanks for your assistance.

Attachments:
A. 6/2/87 Telefax DWK-Hanover to Dr. Bernd-Uwe Jahn, et al. (11 pages)
B. 5/6/87 Letter Si Jung Yeh, National Tsing Hua University, Taiwan, to H. J. Faulkner, NRC

cc w/attachments:
K. Burke, IP/GPA
H. Faulkner, IP/GPA

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TELEFAX

An:
Herrn
Dr. Bernd-Uwe Jahn ⟷ Tel: 298-4330
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Fax-Nr. 202-298-4249

Team visit to NRC on June 11
9^{15} – 11^{15} at Willste Bldg.

Repeat:
Herrn
Hans W. Schechter
Nuclear Regulatory Commission
Fax-Nr. 001-301-492-7142

Von:

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Sehr geehrter Herr Dr. Jahn,

unter höflicher Bezugnahme auf Ihren Anruf vom 1.6.87 übersenden wir Ihnen als Anlage eine Teilnehmerliste mit Angabe der Dienststellen und unseren Fragenkatalog, den wir mit Schreiben vom 14.5.87 bereits an Mr. Carl Cooley übersandt haben.

Wunschgemäß senden wir dieses Telefax mit allen Anlagen auch an Herrn Schechter, NRC.

Mit freundlichen Grüßen

Deutsche Gesellschaft
für
Wiederaufarbeitung von Kernbrennstoffen
mbH

i.V. Jacobi

Att A

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Herrn
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Visit 10th to 23rd June, 1987

Questions

Physikalisch-Technische Bundesanstalt

1. Has public information and participation in site-selecting processes convinced the public and improved site acceptance?

2. Is the transport of radioactive waste to a planned repository an issue of public concern?

3. For how long are individual doses calculated after repository closure? What parameters are considered quantitatively/ qualitatively after 10,000 years?

4. What is the radius of concern for air-borne emissions of a repository during the operational phase?

5. Is it ensured that chemo-toxic waste is not mixed with radioactive waste packages destined for disposal?

6. What scenarios are considered at the selected sites concerning post-closure human interference?

7. Even after thorough site investigations, uncertainties and alternative interpretations and assumptions seem to remain. How will this issue be solved? Is safety analysis based on pessimistic or realistic data?

8. What type of site-specific investigations are carried out to validate hydrogeologic modelling, e.g. application of porous media concept, flow through fractures and structural discontinuities, hydrodynamic dispersion, nuclide migration?

9. Thermally induced salt creep and differential uplift can only be calculated finally after underground investigation. How are these problems tackled in planning and sinking the shafts?

10. What is the minimum acceptable time for the salt barrier to be dissolved by dissolution? What are the average, uniform dissolution rates for the selected salt site? Does local dissolution occur and how are the respective structural discontinuities investigated? What is the maximum depth caused by local dissolution and what local dissolution rates could occur?

11. Will gases and brine pockets be genetically interpreted? Will the long-term safety analyses be based on this type of interpretation?

12. What effects have the requirements on waste package lifetime on the results of site-specific safety analyses?

Visit 10th to 23rd June, 1987

Questions

Bundesanstalt für Geowissenschaften und Rohstoffe

I am mainly interested in the site-characterization phase. Which kind of investigation is planned to allow a detailed study of the host rock? Which kind of test will be performed subsurface to measure in-situ stress, permeability, heat transfer and other rock characteristics? Has DOE already developed a site-characterization for each of the three sites selected for characterization? Does the site-characterization phase include already a concept of the repository to be built at the site?

Visit 10th to 23rd June, 1987

Questions

Niedersächsisches Umweltministerium

U.S. criteria for the choice of site

- Have criteria now been formulated and what aspects are taken into account?

Long-term safety

- In your opinion, what is the time scale for dose calculations? How are the OECD statements with regard to a period of 10^4 years viewed? In comparison, ICRP/IAEA do not postulate a time scale, but the mrem concept.

- Certain water transportation times are required in the USA. More information on this would be desirable.

- For the choice of scenario, in the Federal Republic the natural conditions alone are considered. In the USA, beyond this, potential paths such as drilling (short circuit) or spreading over the shaft are assumed. Some results of investigations would be of interest.

- In contrast with deterministic choices of scenario, in the USA there is a tendency in the direction of a probabilistic procedure in the choice of scenario, including risk evaluation and the determination of potential cases of cancer. What results have been obtained in this respect?

Post-operational phase

- In the USA, in some cases, requirements have been laid down for the barrier properties of waste packages of several hundreds of years (up to 500 years). What proof of container properties such as leakage rates, leach rates etc., is required and how is proveability viewed?

- Is is correct that retrievability is meanwhile only required for the operational phase of the repository?

- How is the supervision of the repository (supervision of the surrounding area, documentation) in the post-operational phase viewed?

Operational phase, criteria for the repository

- In the USA, is the exhausting of legally prescribed limiting values legally possible in the lay-out of the repository?

- Of what significance is the cost/benefit analysis or the ALARA principle in the final disposal?

- What measures have been considered for the sectionalization or the avoidance of chemotoxic material in the repository?

- What criteria must be fulfilled for emplaceability? How extensive must the intake controls be? Is the qualification of procedure in the construction of the waste package sufficient?

- Is a total limitation of the activity inventory envisaged for the repository? If it should be necessary, how can proof be obtained if only the relevant nuclide is indicated?

Visit 10th to 23rd June, 1987

Questions

Niedersächsisches Landesamt für Bodenforschung

- Are we able to generate performance assessment models applicable to such complex systems as given in most of the candidate sites today as the main scientific evidence for licensing geologic repositories of nuclear waste?

- Performance assessments based on undefined or poorly defined repository designs with generic geological conditions could be useful in demonstrating assessment procedures but could not be used to demonstrate the safety of disposal (IAEA 1986 - Panel discussion). Do you agree?

- How do you try to find and measure the water paths related to fractured rocks, according to the results of the work of I. Neretnieks? At the GEOVAL Symposium in April 1987 in Stockholm he said:

  "Field and laboratory observations indicate that water flow is very unevenly distributed in fractured (crystalline) rocks. Most of the naturally flowing water emerged in a few spots. There are consistently only a few channels which carry a large fraction of the water flow rate."

- Do you use date of the pore water composition or the stable isotopic composition for the characterization and determination of the ages of the pore water to investigate regional groundwater flow systems?

- Does the licensing procedure in the USA end with a more or less "static decision" or is it possible to do "long-term observations" in connection with a "retrievable-storage philosophy"?

- Are you experienced in using long-term monitoring tools (for hydraulic tests taking into consideration the petrography, the chemistry of groundwaters, the time span at tools in practise)?

- What is the meaning/how is the definition of the "10,000 year-borderline" used in the long-term safety analysis?

- Can you tell us how you transform statistical data from tectonical investigations (e.g. number/width of fractures) into porosity data and create the mean value of these data and the rock's porosity?

- Can you give us some explanation of the methods or means you use to characterize and discriminate fracture environments in "hard rocks" (from granite to sedimentary rocks)?

  Do you apply comparable criteria (which?) for hazardous, toxic chemical and radioactive waste?

  1. a) What is the rate per year of subrosion at your salt domes?
     b) Do you have subrosion effects at flat salt layers?

  2. Do you have recent uplift of salt domes diapirism, in which a final disposal for radioactive waste should be constructed, and which rate did you determine?

  3. Do you find blocks (caused by tectonic mechanisms) from surrounding rocks or overlying strata in the salt formations and what is your evaluation for thermo-mechanical behaviour and for water flow passes?

  4. Did you recognize hydrocarbones in salt formations and what is the meaning for final waste disposal?

Visit 10th to 23rd June, 1987

Questions

Oberbergamt Clausthal-Zellerfeld

Repository in a Mine

Which body is supervising the repository, how is supervision executed?

Which regulations are envisaged for transport and storage of packagings with radioactive wastes?
Are there special rules (or regulations) for transport and storage systems, or are there special rules for other relevant installations?
Could these regulations be discussed at the sites, i.e. WIPP, Carlsbad, New Mexico?
How is DOE dealing with geological, hydrological, and problems of rock mechanics?
Does DOE engage external experts for these questions?
Are reports available?

Visit 10th to 23rd June, 1987

Questions

Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen

A copy of the "Nuclear Waste Policy Act of 1982" would be appreciated.

Nuclear Waste Fund:
- How does the system work in practice?
- Amount of fees collected since the introduction of the
- Nuclear Waste Policy Act?
- Budget of DOE with regard to candidate sites?
- Budget of DOE for R & D work?
- How is budget control executed?

Estimated repository cost per cubic meter (or cubic foot) of waste?
What is the present attitude towards reprocessing of spent fuel?
How is spent nuclear fuel stored ad interim?
Are there plans for the direct disposal of spent fuel, how would be the outlay of a final repository for this purpose?
What packagings will be required for the direct disposal of spent fuel?