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CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: Technical Exchange Meeting Between DOE and the NWTRB's Structural Geology & Geoengineering Panel on the Exploratory Shaft Facility (ESF) Alternatives Analysis Study.

DOE-NRC Technical Exchange Meeting Concerning the Draft Technical Position on Regulatory Considerations in the Design and Construction of the Exploratory Shaft Facility. (20-3702-021-070-002)

DATE/PLACE OF TRIP: November 19-20, 1990 at the Hyatt Regency in Denver, Colorado.

AUTHORS: Mikko P. Ahola, Chia S. Shih, and Garry L. Stirewalt

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**PERSONS PRESENT:** Mikko P. Ahola, Chia S. Shih, Gerry L. Stirewalt, Jaak J. Daemen, and John E. Latz

**BACKGROUND AND PURPOSE OF TRIP:**

The first day of meetings (19 November 1990) concentrated on the NRC technical position on the regulatory considerations in the design and construction of the exploratory shaft facility. The second day of meetings (20 November 1990) concentrated on DOE's presentation to the NWTRB on the status of the exploratory shaft facility (ESF) alternatives study. A copy of the meeting agenda is attached. The purpose of this trip by the CNWRA personnel was to attend these meetings.

**SUMMARY:**

Presentation on the Draft Technical Position

1. J. Bunting (NRC) pointed out in his introductory remarks that the NRC was raising points at this technical exchange meeting to address potential concerns which may arise because of the collocation of the ESF and the repository. He stressed that the TP was designed to demonstrate an acceptable method of ESF compliance with regulatory considerations. Its main goal is to provide guidance and to identify potential regulatory problems early on so that DOE would have time to comply with them. Three points were raised by Bunting as follows:

(a) He expressed concern that the NRC had not clearly communicated the concept that since the ESF may become a part of an eventual geologic repository

operations area (GROA), the ESF design would be required to satisfy applicable GROA design requirements.

(b) He reiterated the NRC concerns related to use of drill and blast methods for development of the ESF without full consideration for other methods.

(c) He also reiterated the NRC concern about penetration and extensive drifting into the Calico Hills lithologic unit without a clear statement of information needs.

He indicated that the above points were all related to waste containment and isolation, and, hence, were related to major design considerations which could become design features for the repository. In other words, he thought that certain major design features were being considered and determined now, and this caused concern for the NRC. Functioning in the consultative role established for the NRC, he urged that unnecessary uncertainties related to containment and isolation not be introduced by ESF design, and that unnecessary problems not be caused for site characterization by ESF design.

2. D. Gupta gave the main presentation on the NRC draft technical position on regulatory considerations in the design and construction of the ESF, which he indicated would be completed next year. He discussed a number of the NRC staff positions contained in the TP. The following discussions resulted from his presentation:

(a) D. Deere (NWTRB) asked what might happen if NRC staff changed and new concepts were generated in relation to the ESF. D. Gupta and J. Bunting responded that the existing concepts were not cast in concrete, and that the technical position was seen to be flexible enough to accommodate new data, new staff, and new ideas as necessary. The position was presented as an example of one acceptable approach for achieving compliance with 10 CFR Part 60.

(b) D. Gupta expressed some continuing concern about the ESF anomaly, as well as about the fact that some of the designs have more than four openings for the repository.

(c) His personal statements addressed the concept of limiting damage due to construction, rather than "accounting for and mitigating" damage.

(d) C. Allen (NWTRB) asked if some aspects of QA could be limited initially in order to save time and cost in excavation and characterization of the ESF in the event that the site is shown to be unlicensable. J. Bunting said this was not possible because all of the information to be collected was potentially useful in the licensing process.

(e) R. McFarland (NWTRB) asked that if a shaft were backfilled by all QA standards, could this still pose a potential problem. D. Gupta said problems were still possible, and that the filled shaft could be either "better" or "worse" than before, regarding waste isolation.

(f) C. Gertz (DOE) asked the NRC's opinion of the GROA design concepts which the DOE had already presented, questioning whether or not the DOE should do more regarding repository design. D. Gupta commented that the DOE should do more for repository design, when the time is right, because too few comparative analyses had been conducted as yet.

3. M. Blanchard (DOE) discussed the DOE comments on the NRC technical position

paper. The five areas of concern specified included (a) early comparative evaluations, (b) role of ESF, (c) restrictions on excavation methods, (d) absence of supporting rationale, and (e) justification of design modifications.

M. Blanchard commented that the DOE believes there is adequate time for a series of comparative evaluations to be done, but that these evaluations be conducted after some site characterization data has been made available. Too many early evaluations could produce non-meaningful results for waste isolation, due to the limited site characterization data presently available. The evaluations are not viewed by DOE as being discriminators. He also pointed out that the TP implies that DOE is required to justify every ESF design modification to the NRC. He stated that it would be logical to expect changes to the ESF as construction proceeds, and that DOE's internal design control process should be considered as adequate by NRC, since all design changes will need to be approved internally by DOE.

4. A representative of Edison Electric Institute (EEI) presented additional comments on the NRC technical position. He briefly stated that his organization felt NRC's role in the ESF design should be only a consultative one since there will be no license application submitted for the ESF design and construction. The following points of discussion occurred:

(a) EEI believes that DOE needs to get into the characterization of Yucca Mountain as soon as possible in order to determine if the site is acceptable or not. He emphasized that NRC should recognize that the ESF design and construction should permit maximum flexibility to modify the design of the GROA based on data collected during site characterization.

(b) EEI believes that the role of the ESF is to provide a means for DOE to access the subsurface and the proposed repository host rock. It would allow DOE to obtain the data necessary to establish the geological conditions and ranges of parameters of the proposed repository site relevant to the location of the repository, and the suitability of the site. He criticized that NRC's TP has subordinated the ESF's role of data collection to that of ensuring that the ESF would not interfere with the waste isolation capability of the site and that it will become a part of the repository. They felt that such reversal of priorities had created the inconsistency of this TP with the commission's position as stated in 10 CFR 60.15.

(c) The EEI representative concluded that the technical position was probably "not needed". J. Bunting commented that the NRC did believe that the position paper was necessary, and that the merits of the data should be the focus of the hearing process rather than an interpretation of the regulations.

#### Presentation on the ESF alternatives analysis study

1. E. Petri (DOE) gave an overview of the study during the period since the July 25, 1990 meeting. He pointed out that a total of 17 alternative designs for the ESF had been developed plus 17 additional options to allow early access to the Calico Hills lithologic unit. He pointed out that the next NWTRB meeting had been scheduled to be held on January 16, 1991 in Washington, D.C.

2. A. Stephens continued with the ESF alternatives study and pointed out that the ongoing progress had reached the point of comparative evaluations and that the next phase would be to rank the options. The alternatives included in the evaluation are:

(a) Options 1-17 were developed with the objective of obtaining all the data to support the SCP requirements using a systematic progression from the accesses to the Topopah Springs unit and down into the Calico Hills.

(b) Options 18-34 were developed to proceed as quickly as possible to the Calico Hills to identify the potential evidence of site unsuitability, deferring tests in the accesses except those that would be irretrievably lost if not acquired during access construction.

A. Stephens reported that multiple expert panels had been organized and utilized to provide different performance measurements subjectively based on the objective information provided by the staff.

3. L. Merkhofer (ADA) and P. Gnirk (RESPEC) jointly presented the evaluation of the ESF alternatives. These options were evaluated by estimating:

(a) The impacts of ESF options on the likelihood of important down stream decisions and uncertainties including:

- (i) programmatic viability
- (ii) early ESF test outcome
- (iii) late ESF outcome
- (iv) regulatory authorization
- (v) repository construction/operation possibilities

(b) The final consequences of all the possible combinations of events.

The judgmental probabilities of all the events and the consequences of potential combinations of events was provided by the consensus of judgements on the multi-attribute utility by specific expert panels. Cost impacts were developed based on engineering economic estimations.

#### IMPRESSIONS/CONCLUSIONS:

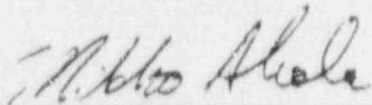
Overall, the meetings went well. DOE recommended that they meet with the NRC to further discuss concerns and potential changes related to the technical position on regulatory considerations in the design and construction of the ESF. Based on discussions at such a meeting, they felt that the TP should be re-issued for comment, prior to finalization. Regarding DOE's presentation to the NWTRB on the ESF alternatives study, a number of questions were raised on the approach taken by DOE in their decision making process. Due to the limited amount of time scheduled for this meeting and the amount of material that DOE was to present, the NWTRB felt it was necessary to limit the number of questions from the audience. Dr. Deere of the NWTRB recommended that these questions and discussions be deferred to the next DOE/NWTRB meeting in January, 1991.

PROBLEMS ENCOUNTERED: NONE

PENDING ACTIONS: NONE

SIGNATURES:

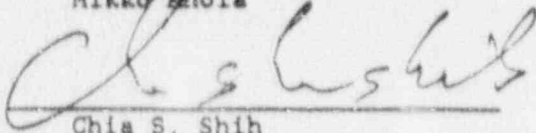
SIGNATURES:



Mikko Ahola

12/20/90

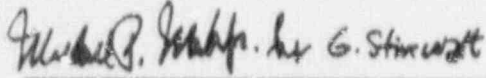
Date



Chia S. Shih

11/20/90

Date

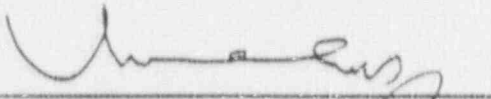


Gerry L. Stirewalt

12/26/90

Date

CONCURRENCE:



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Manager, RDCO

12/20/90

Date



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12/26/90

Date

for



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## Agenda

### Structural Geology & Geoengineering Panel and Department of Energy - Technical Exchange

#### Exploratory Shaft Facility (ESF) Alternatives Analysis Study

Hyatt Regency Denver - Anaconda Tower  
November 19-20, 1990

#### November 19, 1990

2:30 p.m.

Nuclear Regulatory Commission (NRC) discussion of the draft technical position on regulatory considerations in the design and construction of the exploratory shaft facility.

3:30 p.m.

Department of Energy (DOE) discussion of its analysis of the draft technical position.

4:30 p.m. - 5:00 p.m.

Edison Electric Institute (EEI) comments on NRC's technical position.

#### November 20, 1990

8:30 a.m.

##### Overview

- Brief review of the alternative analysis process and definition of the decision tree
- Basis for subsequent presentations

##### Requirements applicable to the evaluation

- Regulatory and testing requirements
- Process of defining applicability to the ESF alternatives analysis

##### Influence diagrams and evaluation panels

- Detailed discussions of example influence diagrams(s)
- "Crosswalks" of requirements to influence diagrams
- Supporting information for evaluation panels.

(over)

	Options evaluated <ul style="list-style-type: none"> <li>• Brief review of selected option(s)</li> <li>• Summary data for each option/evaluation panel</li> </ul>
11:30 a.m.	Lunch
1:00 p.m.	The evaluation (scoring) process <ul style="list-style-type: none"> <li>• Steps of the process</li> <li>• Sample worksheets and instructions</li> <li>• Sample results from each step</li> <li>• Ranking of options within each category</li> <li>• Sensitivity of rank to uncertainties</li> <li>• Current status and remaining steps</li> </ul>
4:00 p.m.	Summary and discussion
4:30 p.m.	Closed NWTRB panel discussion
5:00 p.m.	Adjourn