

ITASCA TRIP REPORT

DATE: 31 August 1987

LOCATION: Hyatt Regency West (Houston, Texas)

PURPOSE: To Observe the ESF Title II 60 Percent Design Review Introductory Meeting, Salt Repository

ATTENDEES: J. Daemen (Itasca)
N. Tanious (NRC)

PREPARED BY: J. Daemen

SUMMARY

The purpose of this one-day meeting was to prepare for a 30-day review of the ESF Title II 60 Percent Design Review of the PB/PB-KBB salt repository design. The review is to be performed by some 35 to 45 people from the following organizations: SRPO; Battelle; Fluor/MKE; Parsons Redpath; Golder; Army Corps of Engineers; DOE HQ/Weston; DOE Chicago; MSHA; and the U.S. Bureau of Mines. The 60 percent design was presented by 18 people from PB/PB-KBB. The review procedure was detailed by the Battelle Design Review Board, consisting, primarily, of G. K. Beall (Board Chairman), T. M. Goodell (Board Secretary), and G. H. Erikson (QA). The meeting agenda and participants are enclosed (Attachments I and II, respectively.)

Review Procedures

The primary difference between the 30% review procedure and the 60% review procedure appears to be in a streamlined, smooth, and very tightly controlled comment flow control. One could not help but be impressed with the repeated and very emphatic emphasis placed by the review organizers on the absolute need for a complete following by all participants of the Battelle Document Review Procedure. All comments will be documented and resolved according to established ONWI TMP 22 Review Procedures (Attachment III.) Clearly, it would be premature to draw final conclusions about the review procedures and process prior to its completion. It involves a large number of people and organizations

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on the review site, as well as a large number of people of the responding (design) group, and remains a rather complex task to be completed in a strictly limited time. It will be of considerable interest to evaluate the success of the comment control and dispositioning at the end of the review.

General Overview

Although the meeting was dominated by procedural concerns, it included a fast-paced extensive four-hour introduction to the technical content of the 60% design (Attachment I). The technical overview included the following sections:

- (1) General (65 minutes) ;
- (2) Mining (100 minutes);
- (3) Infrastructure (60 minutes); and
- (4) Environmental (10 minutes).

The extremely fast presentations, combined with the fact that copies of viewgraphs were not presented, made it difficult to provide any detailed technical assessment of the current design. Moreover, while the infrastructure (in particular, the civil, mechanical, structural, and electrical designers) specifically identified changes between the 60% and the 30% design, the mining designers did not identify such differences. This further complicated the task of evaluating progress and changes since the 30% design.

It is of note that the time allotted for mining significantly exceeded the time of other categories. Even more noticeable was the emphasis placed by management, both PB/PB-KBB and Battelle, on the very high priority assigned to shaft design review. This emphasis was stressed several times by both parties, as they repeatedly asked for comments on shaft design.

Technical (ESF Design) Comments

Layout of ESF underground facility is considered final and complete. Drift sites are reduced to the absolute minimum, except where needed for testing, to reduce excavation and surface storage of unnecessary tonnage.

Ventilation — Major Requirements

- supply, distribute and exhaust adequate air volumes
- standby unit for main exhaust fan
- accommodate salt creep for all control elements
- criteria: 80°F WB, 95° DB, 80°F effective

Underground Stability

- require safety factor of at least 1.5 for all pillars
- estimate shaft closure; analyze the effects of compressible backfill and time-dependent salt behavior
- determine required overexcavation
- determine subsidence
- design room reinforcement

Pillar Stability

used Wilson design method; compared results with Obert and Duvall, Bieniawski, and Dreyer; found safety factor of at least 2 everywhere

Subsidence

two-dimensional and axisymmetric viscoelastic finite element analysis; looked at shaft tilt, curvature, strain (all extremely small)

Shaft Closure

analyzed by three methods (FEM, manual, and extrapolation from WIPP); will overexcavate 20 inches for unlined shaft, 12 inches in lined shaft sections.

Reinforcement Design

point-anchored grouted bolts with compressible flexible soft-plate padding; based on beam loading by a disturbed zone (16-foot bolts on 4-foot centers)

Shaft Design

- two shafts to test horizon
- conventional sinking; freezing; controlled excavation [freezing analysis (ice wall design) is not part of bid package]
- umbrella type single circle freeze holes

Shaft Excavation, Liner and Construction

will pay full attention to testing requirements; schedule will allow for it

Water Inflow

- limits 0.3 gpm total, 0.1 gpm local
- liner designed for hydrostatic pressure in upper shaft section
- confinement seals below and above aquifers consist of two sanded grout columns and two chemical seals each

Hoisting System

- has been modified significantly
- Shaft 2 has been deepened to provide greater flexibility

Infrastructure (surface)

- soil compaction has been investigated in order to allow reduction in foundation sizes
- surface layout has been modified significantly, based on 30% design review comments, to allow smoother construction and operation
- surface area is slightly larger

Mine Dewatering System Design

- 200 gpm, sump to surface

Electrical Grounding System

will pose a real challenge; need seven independent systems

Environmental

- primary concerns: waterproof barriers
- asphalt shaft lining
- chemical seals

Graded QA of ESF Structures, Systems and Components Important to Safety, Retrievability, and Waste Isolation

based on "Decision Criteria for Determination and Assignment of QA Labels for Items and Activities"; applied by engineering judgement during last 3 weeks

Initial Results:

- QA Level 1 — 22% (e.g., shaft liner, shaft concrete, fire water tank)
- QA Level 2 — 8% (e.g., stand-by power)
- QA Level 3 — 70%

Design Bases

- requirements document
- detailed design criteria
- baseline elements status report
- references

Plans for 90% Review

all drawings and specifications will be complete

Near the end of the meeting, serious reservations were expressed by two reviewers about the Shaft Design Guide. Detailed discussion was deferred to a planned shaft design meeting to be held by a much smaller group within the next day or so. It would seem very desirable for NRC to try to obtain a copy of the Shaft Design Guide and to subject it to careful scrutiny.

Respectfully, submitted,


Jaak Daemen

attach.
jd/ks

COST BREAK-OUT

Labor

J. Daemen	8 hrs @ \$57.75/hr	\$ 462.00
	TOTAL LABOR	\$ 462.00

Actual Expenses

Travel

Airfare		\$ 318.00
Daemen (Tucson-WDC)		
Miscellaneous Travel Expenses		25.00
Daemen (taxis)		

Lodging

Daemen		60.00
(1 night at \$60.00/night)		

Meals

Daemen		33.00
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TOTAL EXPENSES: \$ 436.00

ATTACHMENT I

**ESF TITLE II 60 PERCENT DESIGN REVIEW
INTRODUCTORY MEETING
AGENDA**

**ESF TITLE II 60 PERCENT DESIGN REVIEW
INTRODUCTORY MEETING
AGENDA**

DATE: August 31, 1987
LOCATION: Hyatt Regency-West Houston, 13210 Katy Freeway, Houston, Texas
PHONE: 713/558-1234
ROOM: Texas I and II, 1st Floor
TIME: 8:00 AM - 5:00 PM

<u>SCHEDULE</u>	<u>ITEM</u>	<u>RESPONSIBILITY</u>
8:00 AM	Introduction <ul style="list-style-type: none"> ● Purpose ● Organization ● Agenda ● Design Board ● Schedule 	SRPO/Battelle
8:45 AM	Design Review Plan and Scope <ul style="list-style-type: none"> ● Participating Organizations ● Review ● Integration ● Resolution ● Report 	Battelle
9:10 AM	Presentation of Design	PB/PB-KBB
10:15 AM	15 Minute Break	
10:30 AM	Presentation of Design (continued)	PB/PB-KBB
12:15 PM	Lunch - Texas Ballroom No. III	
1:15 PM	Presentation of Design (continued)	PB/PB-KBB
2:30 PM	Design Review Objective <ul style="list-style-type: none"> ● Compliance with Requirements and Criteria ● Constructability ● Operability ● Safety ● Design Review Organization/Logistical Support/Reference Material/Other Meetings 	Battelle
3:15 PM	15 Minute Break	
3:30 PM	Instructions to Reviewers <ul style="list-style-type: none"> ● Comments ● Forms/QA ● Flow Chart ● Deliverables ● Reviewer's Responsibility ● Signoff of Deferred 30% Comments 	Battelle
4:00 PM	Closing Comments and Questions	
4:30 PM	Review Package Distribution	

ATTACHMENT II
ESF TITLE II 60 PERCENT DESIGN REVIEW
INTRODUCTORY MEETING
PARTICIPANTS

ATTACHMENT III
ONWI TMP 22 REVIEW PROCEDURES