

June 16, 1999

Dr. Stephen J. Brocoum
Assistant Manager for Licensing
U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 30307
North Las Vegas, NV 89036-0307

SUBJECT: MINUTES OF THE JUNE 3 - 4, 1999, TECHNICAL EXCHANGE ON THE U.S. DEPARTMENT OF ENERGY'S GEOLOGIC FRAMEWORK MODEL 3.1 (GFM 3.1)

Dear Dr. Brocoum:

Enclosed are the minutes of the June 3-4, 1999, technical exchange between the staff of the U.S. Department of Energy (DOE) and the U.S. Nuclear Regulatory Commission (NRC). The purpose of the technical exchange was for DOE to provide the NRC staff and its contractors with a hands-on, one-on-one workshop on DOE's Geologic framework Model, Version 3.1 and provide a comparison between this version and the previous Version GFM 3.0 which the staff had already reviewed and documented in the Structural Deformation and Seismicity Issue Resolution Status Report.

The meeting was conducted in a professional and cordial atmosphere and resulted in a good exchange of information regarding the use of GFM 3.1. No response to this letter is required. If you have any questions regarding the enclosed meeting minutes, please contact Dr. Bakr Ibrahim of my staff. He can be reached at 301-415-6651 or by E-Mail at aki@nrc.gov.

Sincerely,
[Original signed by D. Brooks for:]

C. William Reamer, Chief
High-Level Waste and Performance
Assessment Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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Sincerely,

A handwritten signature in black ink, appearing to read "C. William Reamer".

C. William Reamer, Chief
High-Level Waste and Performance
Assessment Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

cc: See Distribution list

Letter to S. Brocoum from C.W. Reamer dated: June 16, 1999

cc: R. Loux, State of Nevada
S. Frishman, State of Nevada
L. Barrett, DOE/Wash, DC
A. Brownstein, DOE/Wash, DC
S. Hanauer, DOE/Wash, DC
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MINUTES OF THE JUNE 3-4, 1999
U.S. DEPARTMENT OF ENERGY/NUCLEAR REGULATORY COMMISSION
TECHNICAL EXCHANGE ON DOE'S GEOLOGIC FRAMEWORK 3.1

On June 3-4, 1999, the U.S. department of Energy (DOE) and the U.S. Nuclear Regulatory Commission (NRC) conducted a Technical Exchange to discuss DOE's Geologic Framework Model 3.1 (GFM 3.1). GFM 3.1 is a revised version of GFM 3.0 which the staff reviewed last year. The staff is currently reviewing GFM 3.1 as a step in achieving a common understanding of the results of DOE's Integrated Site Model (ISM). In order to conduct a review and evaluation of GFM 3.1, the staff and its contractors, the Center for Nuclear Waste Repository Analysis (CNWRA) and MANDEX, determined that they need to consult with DOE in order to understand the main differences between GFM 3.0 and GFM 3.1 and the rationales for the revision.

The Technical Exchange was held at the NRC Headquarters, in Rockville, MD, in the Computerized Risk Assessment and Data Analysis Laboratory (CRADAL). The detailed agenda for the meeting is enclosed as Attachment 1, and the list of attendees as Attachment 2.

The Technical Exchange was opened by a statement from M. Tynan DOE's representative, and B. Ibrahim identifying the purpose of the meeting and introduced DOE's and NRC's contractors and one public attendee. Following the opening remarks, M. Tynan proceeded with discussing the Process Model Report (PMR) which intended to:

1. Document the technical basis supporting the TSPA.
2. Develop the technical information to TSPA.
3. Provide traceability of data, information, and references.

He indicated that the ISM is one of the several PMRs which will be developed by DOE and it will provide:

1. Description of the models, submodels, and abstraction.
2. Relevant data and uncertainties.
3. Assumptions and basis.
4. Model results.
5. Code verification and validation.
6. Information to support regulatory evaluations.

Following M. Tynan, R. Clayton provided an overview of the character of ISM and GFM models, and a summary of the differences between GFM 3.0 and GFM 3.1. He indicated the main differences between the two versions are:

1. Incorporate new data from recently drilled boreholes.
2. Fault dips and shapes were revised to be consistent with cross sections.
3. Modification of isochore maps based on the new borehole data.

After these brief presentations by DOE and its contractor, the attendees started the discussion of GFM 3.1. The primary focus on day 1, June 3rd, discussions, was on the stratigraphic frame work, including modeling methodology, technical hurdles, technical issues for model construction and input data sets, honoring input data, identification of needed files and file nomenclature, identification of inconsistencies in model and modification of some, logic for interpretations, issues related to representation of stratigraphic horizons, horizon thickness, character of horizons at faults contact, and model output capabilities.

In addition the following points were discussed on June 3, 1999:

1. Did the new borehole data confirm the original GFM 3.0 model or did major modifications have to be made?
2. Uncertainties associated with the newly acquired data.
3. How much effect the new version GFM 3.1 will contribute to changes to the total performance of the site.
4. How fractures were accounted for in this version.
5. Does GFM 3.1 provide the necessary structural resolution to be used by the engineers for the construction and design of the surface handling facility?
6. How GFM 3.1 would be used in consideration of UZ modeling.

On the second day, June 4, the discussion focused on faults, fault geometry, and internal block stratigraphy and structure.

In addition, the following points were discussed on June 4, 1999:

1. Modeling methodology for construction of 2D fault surface grids in GFM3.1, including how data files were developed since little borehole information exists on subsurface fault geometry.
2. Rationale for showing curved fault geometry for many faults at depth in GFM3.1 - a change from how subsurface fault geometries were illustrated in GFM3.0 - in direct response to comments generated by the NRC as a result of the review of GFM3.0..
3. Model output capabilities and how GFM3.1 is linked with design studies and mineralogical, statistical rock property, and hydrologic (porous and fracture flow) models.
4. Review of observations made during review of GFM3.0 to determine if new knowledge had been gained and incorporated into GFM3.1 relative to these points of observation.

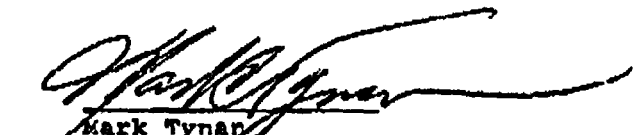
During the Technical Exchange one of the main questions posed to DOE was how will GFM 3.1 be used in the Yucca Mountain Project. Another issue discussed during the Exchange was the qualification of all the data used to construct the GFM 3.1 model.

DOE intends to issue GFM 3.1 report around October 1999 and the qualification of the data used in the model should have been completed by that time.

At the close of the Technical Exchange, summary statements were made by the participating parties. All the participants concluded that the Exchange accomplished its objectives and was highly productive. Staff will prepare a written review of GFM 3.1 which will be enclosed in SDS IRSR Rev. 2.


Sakr Ibrahim

Division of Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission


Mark Tynan

Yucca Mountain Project
Office of Project
Execution
U.S. Department of
Energy

MEETING AGENDA FOR 3-4 JUNE 1999
TECHNICAL EXCHANGE BETWEEN DOE AND NRC ON THE 3D YUCCA MOUNTAIN
GEOLOGICAL FRAMEWORK MODEL, VERSION 3.1 (GFM3.1)
NRC-HQ, ROCKVILLE, MD

OBJECTIVE: NRC/MANDEX/CNWRA staff to gain a thorough understanding of GFM3.1 and associated files in order to review and comment on acceptability of GFM3.1

THURSDAY 3 JUNE 1999

Statements from NRC and DOE / Introduction of Attendees	9:00 - 9:15am
General Overview of GFM3.1	9:15 - 11:00am
<i>Discussion topics include, but are not limited to, modeling methodology, technical hurdles, honoring input data, logic for interpretations, and model output capabilities. These topics will be revisited as necessary during the course of the exchange.</i>	
Break	11:00 - 11:15am
Examination of Fault Surfaces and Associated Files	11:15 - Noon
<i>Discussion topics include, but are not limited to, potential issues related to representation of fault geometry in GFM3.1</i>	
Lunch	Noon - 1:00pm
Examination of Fault Surfaces and Associated Files	1:00 - 5:00pm

FRIDAY, 4 JUNE 1999

Examination of Stratigraphic Horizons and Associated Files	9:00 - 11:00am
<i>Discussion topics include, but are not limited to, potential issues related to representation of stratigraphic horizons, horizon thickness, and character of horizon surfaces adjacent to faults in GFM3.1.</i>	
Break	11:00 - 11:15am
Examination of Stratigraphic Horizons and Associated Files	11:15 - Noon
Lunch	Noon - 1:00pm
Examination of Stratigraphic Horizons and Associated Files	1:00 - 2:30pm
Consideration of Other Pertinent Features of GFM3.1 / Wrap-up	2:30 - 4:30PM

NRC CONTACT: P. JUSTUS (301) 415-6745

ATTENDANCE LIST

DOE/NRC TECHNICAL EXCHANGE GEOLOGIC FRAMEWORK MODEL 3.1

June 3-4, 1999

Name	Affiliation	Address	Telephone No.
Bakr Ibrahim	NRC	Rockville, MD	301-415-6651
Mark Tynan	DOE/YMP	Las Vegas, NV	702-294-5457
Gerry Stirewalt	NRC/MANDEX	Rockville, MD	301-415-5265
Robert Clayton	M&O/URS- Woodward Clyde	Las Vegas, NV	702-295-5754
Darrell Sims	CNWRA	San Antonio, Tx	210-522-6829
Bob Elayer	M&O/MK-Design	Las Vegas, NV	702-295-5154
Ram Murthy*	DOE/RW-3	Las Vegas, NV	702-794-5549
Sidney Crawford*	Self/Public	Maryland	301-515-6398

* Attended only June 3, 1999