U.S. Department of Energy
Office of Civilian Radioactive Waste Management

Total System Performance Assessment and Integration Issue Resolution Status Report, Revision 2

Presented to:
NRC/DOE Technical Exchange on Total System Performance Assessment (TSPA) for Yucca Mountain
San Antonio, Texas

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YUCCA MOUNTAIN PROJECT

Presentation Overview

- DOE General Approach to Issue Resolution
- Status of Issues Related to the Total System Performance Assessment and Integration (TSPAI) Issue Resolution Status Report (IRSR)
- Discussion of Approach to Addressing TSPAI IRSR Subissues
- IRSR Tracking Database
- Summary

DOE General Approach to Issue Resolution

- **DOE is committed to an approach to resolution in the risk-informed, performance-based approach to issue resolution**
- **Issues will continue to be addressed through formal interactions and correspondence**
- **Issues will be tracked using a database to ensure that all issues are ultimately addressed**
- **TSPAI IRSR Rev. 2 Acceptance Criteria are addressed in PMRs**

Subissues Supporting the TSPAI KTI Objective

KTI SUB-ISSUES	IMPORTANCE TO WASTE ISOLATION
1 System Description and Demonstration of Multiple Barriers	Demonstrates the effectiveness and diversity of the barriers as a measure of the resiliency of the repository
2 Scenario Analysis	Describes what can reasonably happen to the repository and the processes and events that can affect the system
3 Model Abstraction	Provides for a systematic examination, in the context of the total system performance, whether models, assumptions, and input data have been appropriately identified, incorporated and analyzed in the TSPA-SR
4 Demonstration of the Overall Performance Objective	Provides for a transparent demonstration of compliance with the overall performance objective

Status of Issues Related to the TSPAI KTI

- **TSPAI Subissues Status**
  - **System Description and Multiple Barriers (Open)**
  - **Scenario Analysis (Open)**
  - **Model Abstraction (Open)**
  - **Overall Performance Objective (Open)**
- **32 Site Characterization Analysis (SCA) issues are identified in the TSPAI Issue Resolution Status Report, Revision 2:**
  - **27 are resolved**
  - **5 remain open**
- **Attached table addresses open issues related to the TSPAI KTI**

SUBISSUE 1 - System Description and Demonstration of Multiple Barriers

- **Transparency**
  - **The TSPA Methods and Assumptions document provides a roadmap for development of the TSPA-SR**
  - **Explicit discussions of the TSPA methodology and treatment of uncertainty are also part of the TSPA-SR**

SUBISSUE 1 - System Description and Demonstration of Multiple Barriers

- **Traceability**
  - **Assumptions and details of the analyses will be in the TSPA-SR document, PMRs and supporting AMRs**
  - **The TSPA analysis tools allows direct tracking of information along its entire path through the analysis**
  - **Unique data tracking numbers are assigned for traceability and control of Q-status**
  - **The TSPA-SR document is tied directly through text, table, and graphics to the supporting Analysis and Model Reports (AMRs) and Process Model Reports (PMRs)**

SUBISSUE 1 - System Description and Demonstration of Multiple Barriers

- **Multiple Barriers**
  - **The entire TSPA analysis is built on a succession of process-level and abstracted models that represent the various parts of the natural and engineered system**
  - **TSPA-SR will show performance analysis results for the various components of the system**
  - **TSPA-SR sensitivity studies and barrier importance analyses will evaluate the contribution and the relative importance to system safety of major system components and barriers**

SUBISSUE 2 - Scenario Analysis

- **Methodology and TSPA-SR implementation will be documented in the TSPA-SR Technical Report**
- **Description of the individual FEPs for each process, including the screening analysis results, is included in the associated PMR and supporting AMR**
- **The FEPs database has been revised to enhance the understanding of its structure**

SUBISSUE 3 - Model Abstraction

- This subissue addresses the adequacy with which the various components of the engineered system, geosphere, and biosphere are treated in the TSPA-SR (Chapter 3) and supporting analyses PMRs and AMRs
- Subsequent Technical Exchanges will cover the details of the various component models

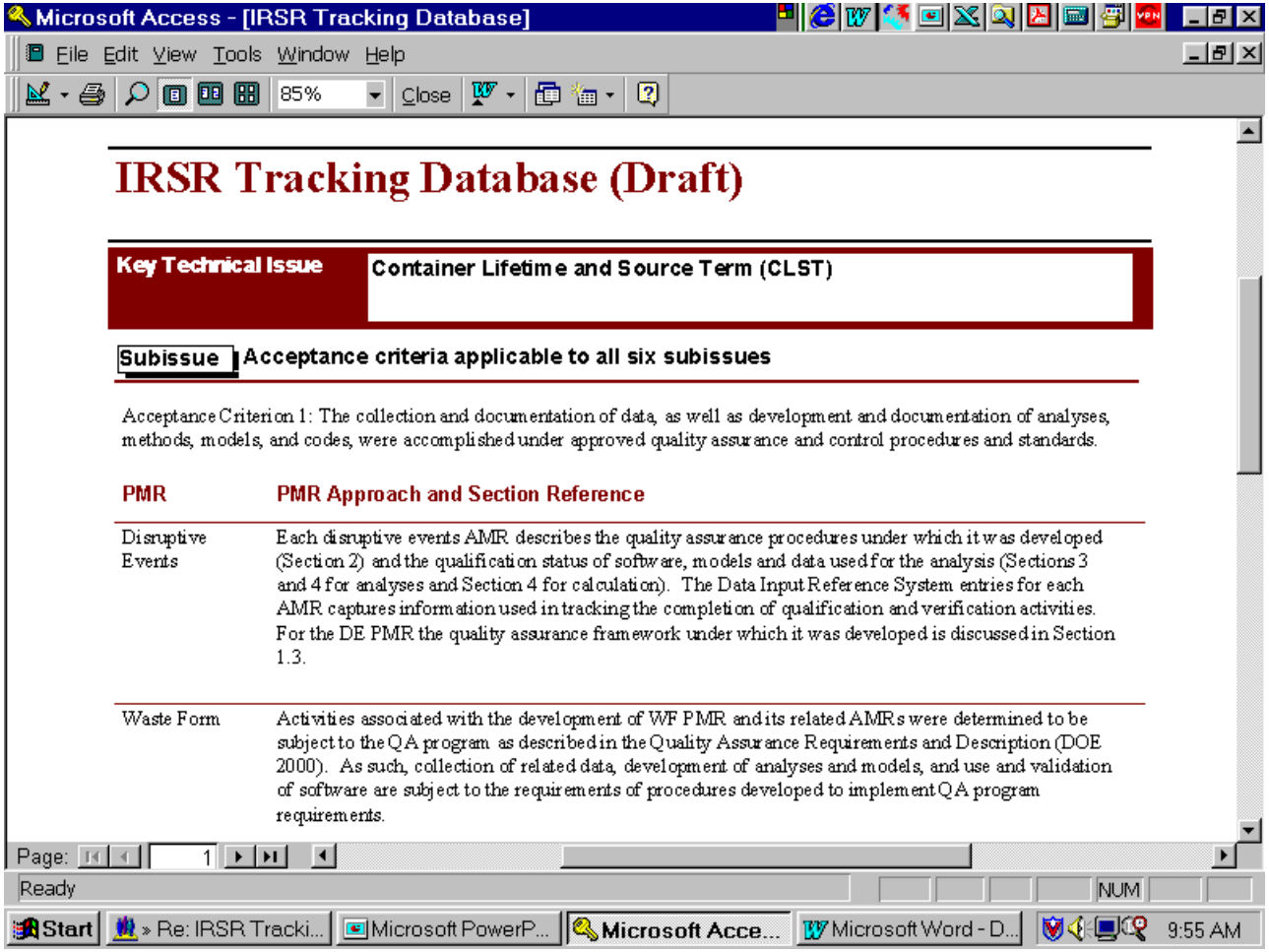
SUBISSUE 4 - Demonstration of the Overall Performance Objective

- Acceptance criteria and review methods to be issued in succeeding versions of the IRSR
- TSPA-SR will be conducted to comply with proposed 10 CFR Part 963, and 40 CFR Part 197 in terms of addressing the prescribed requirements for the total system
- Chapter 4 of the TSPA-SR will consist of the nominal, disturbed, and combined performance results
- Chapter 5 shows the results of uncertainty analyses, sensitivity analyses, and barrier importance analyses

IRSR TRACKING DATABASE

- IRSR Tracking Database currently being developed
- IRSR Tracking Database is designed to track how NRC subissues within the KTIs have been addressed by TSPA
- Database includes four key tables
  - IRSR Acceptance Criteria and ISI Tables
  - RSS4 Table
  - Mapping Table
  - Summary Table
- The database is designed to link with the FEP database

IRSR TRACKING DATABASE



SUMMARY

- TSPAI IRSR Rev. 2 Acceptance Criteria are addressed in PMRs (see attached table)
- Open issues identified in the TSPAI IRSR Rev. 2 and in previous interactions are being addressed (see attached table)
- Significant progress has been made in addressing issues related to Transparency,Traceability and FEPs
- Issues related to Model Abstraction will be discussed at subsequent Technical Exchanges