



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**

Presented by:  
**Holly A. Dockery  
Performance Assessment Department  
CRWMS M&O/Sandia National Laboratory**

**June 7, 2000**

**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 TSPA I KTI Objective

KTI SUB-ISSUES	IMPORTANCE TO WASTE ISOLATION
<b>1 System Description and Demonstration of Multiple Barriers</b>	<b>Demonstrates the effectiveness and diversity of the barriers as a measure of the resiliency of the repository</b>
<b>2 Scenario Analysis</b>	<b>Describes what can reasonably happen to the repository and the processes and events that can affect the system</b>
<b>3 Model Abstraction</b>	<b>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</b>
<b>4 Demonstration of the Overall Performance Objective</b>	<b>Provides for a transparent demonstration of compliance with the overall performance objective</b>

# 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**

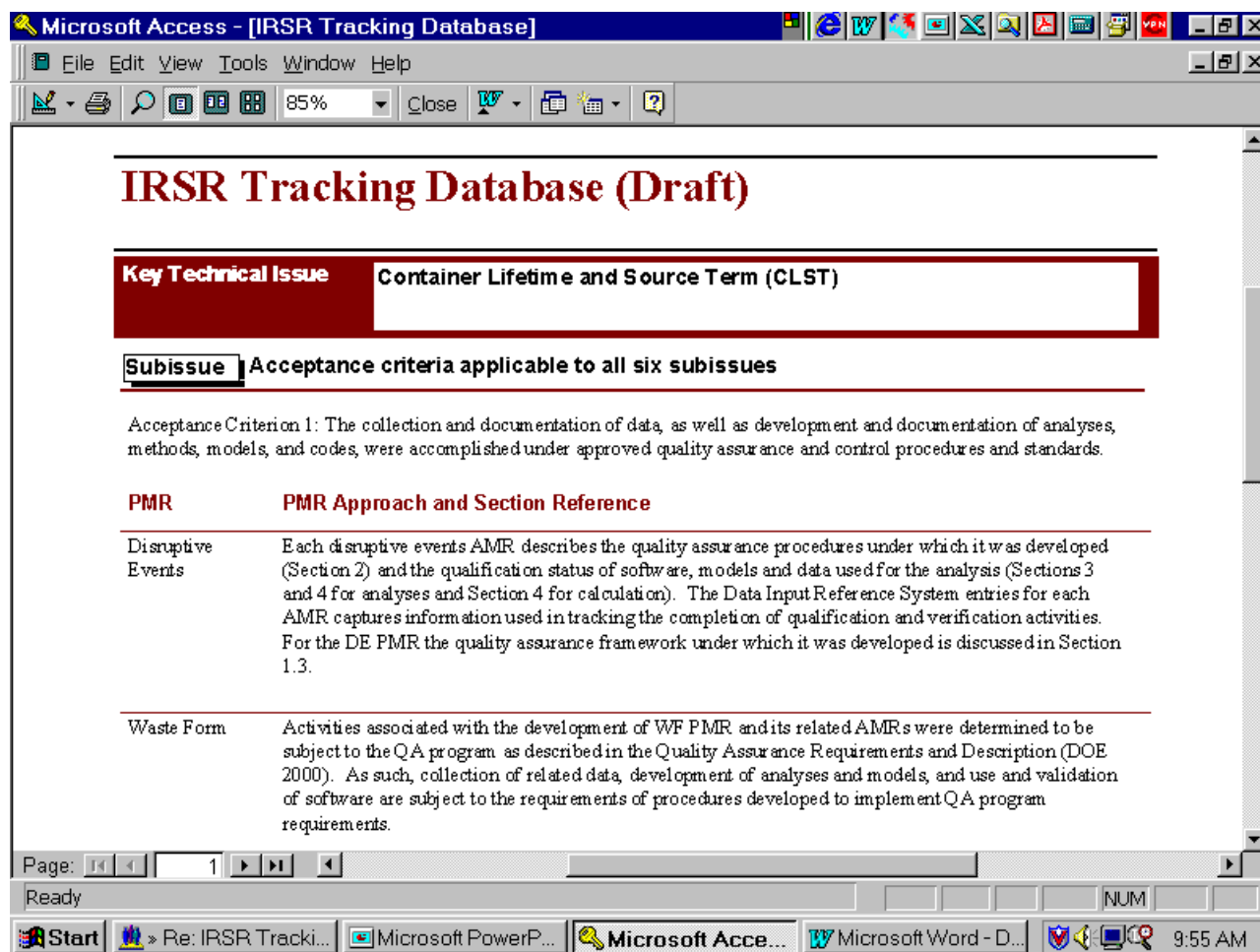
# **SUBISSUE 4 - Demonstration of the Overall Performance Objective**

- **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**