

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

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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

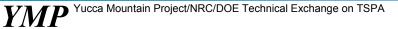


IRSR TRACKING DATABASE

- 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

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IRSR	Tracking Database (Draft)	
Key Techni	cal Issue Container Lifetime and Source Term (CLST)	
Subissue	Acceptance criteria applicable to all six subissues	
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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

