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NRC INSIGHTS ON PRESENTATION OF PA RESULTS

Presented by

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NRC/DOE Technical Exchange on

Total System Performance Assessments for Yucca Mountain

Legacy/main - K

TOPICS

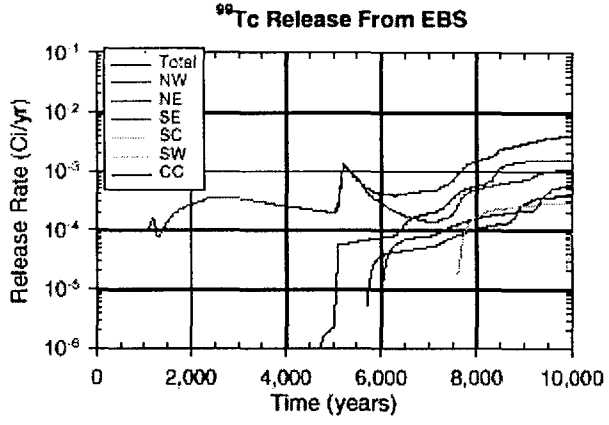
- Components of Transparency and Traceability
- What Has Helped NRC Understanding of VA
- Areas Where the VA Could Have Been More Transparent and Traceable

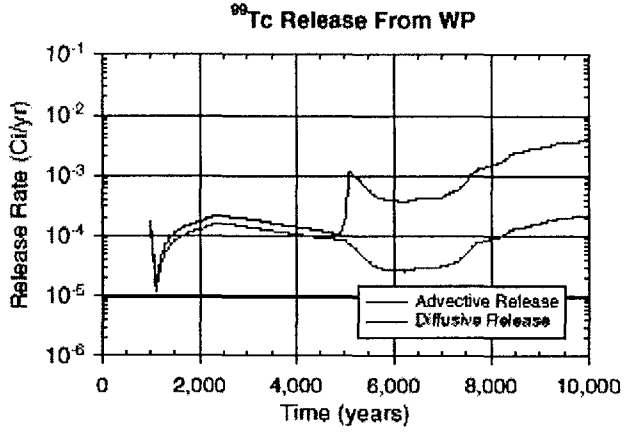
COMPONENTS OF TRANSPARENCY AND TRACEABILITY

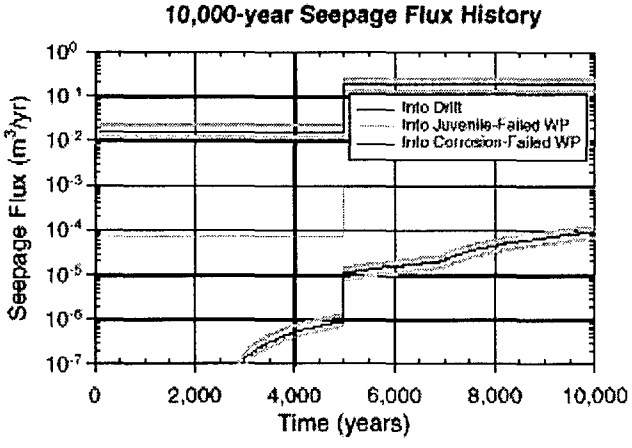
- Clear Identification of Data Transfer From One Component or Model to Another in the Description of the TSPA
- Demonstration of Consistent Treatment of Uncertain Parameters Sampled at the System and Component Levels
- Clear Description of Bases for Models of the TSPA and Data Used in the TSPA
- Clear Identification of Those Portions of the System That Have a Significant Impact on Performance of the Overall Repository

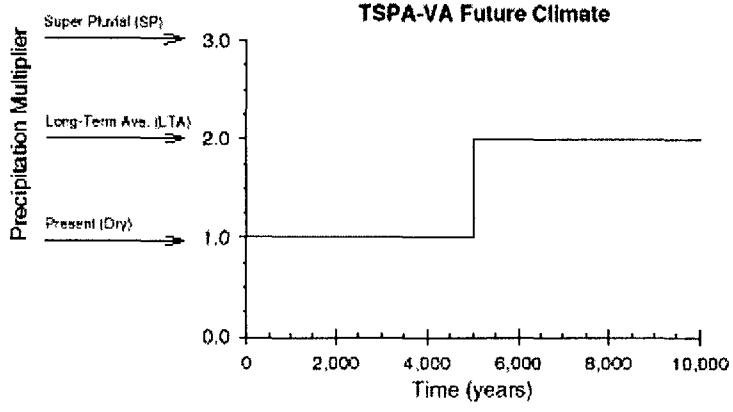
WHAT HAS HELPED NRC UNDERSTANDING OF VA

- **Extensive Plots of Intermediate Outputs**



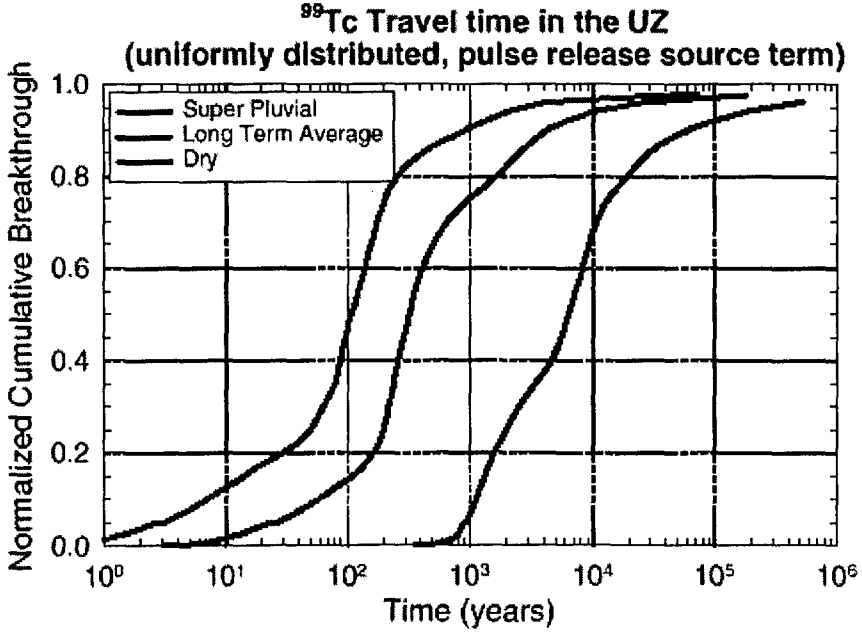


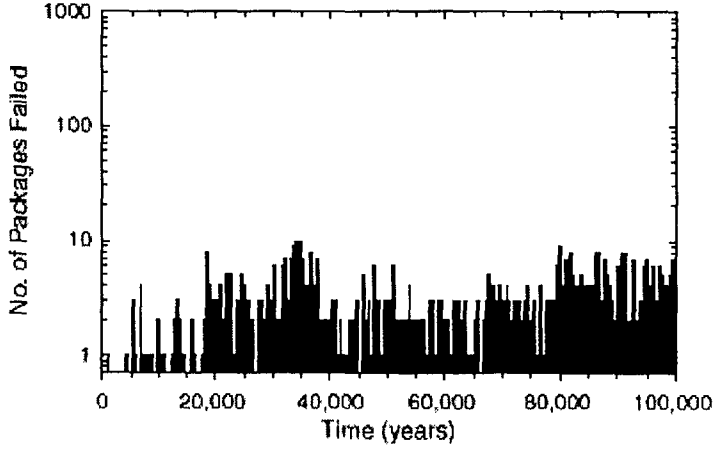




WHAT HAS HELPED NRC UNDERSTANDING OF VA

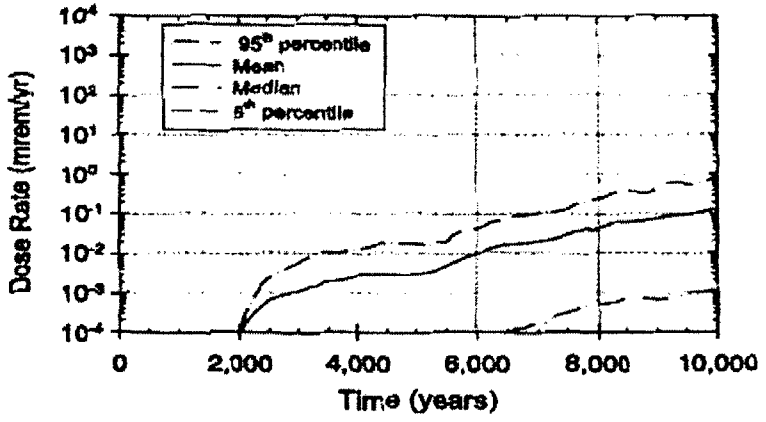
- **Text Description of How the System Is Performing Over Various Time Periods**
- **Plots of the Performance of Subsystems Such As Travel Times and Waste Package Lifetimes**

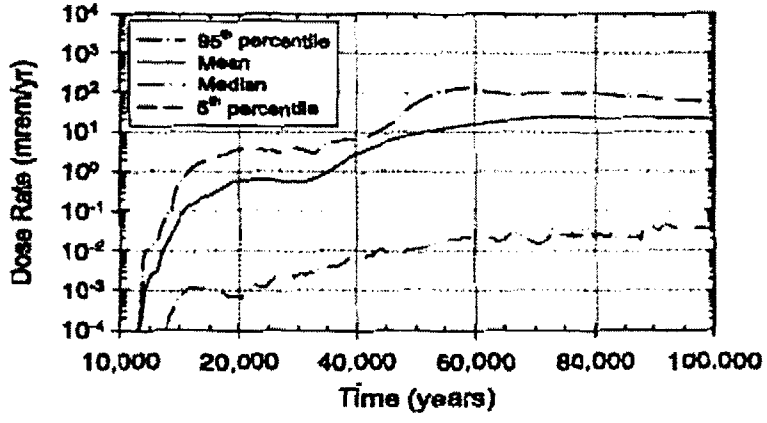




WHAT HAS HELPED NRC UNDERSTANDING OF VA

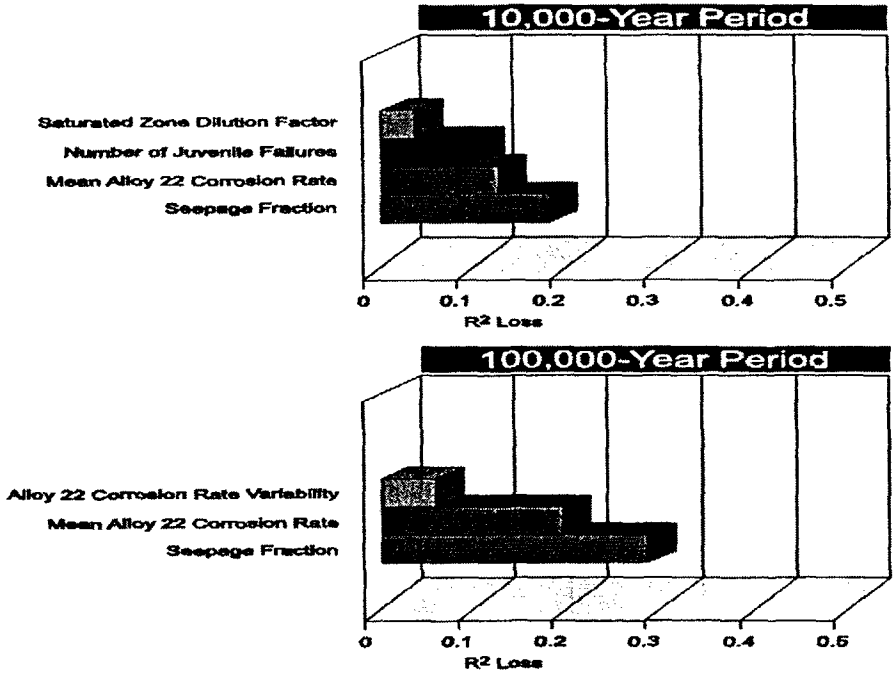
- **Plots of 5th and 95th Percentiles of the Dose-rate Distribution**

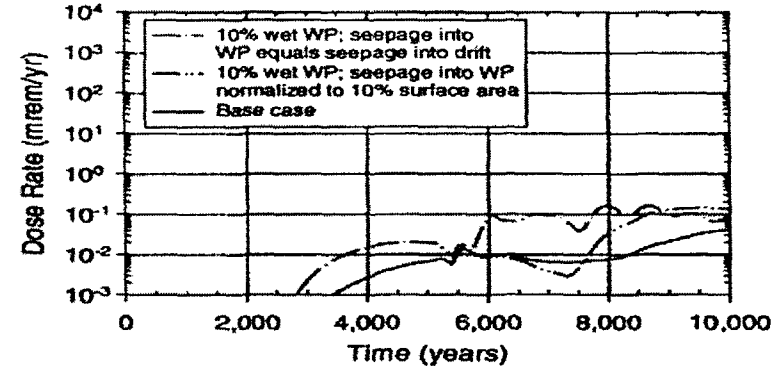


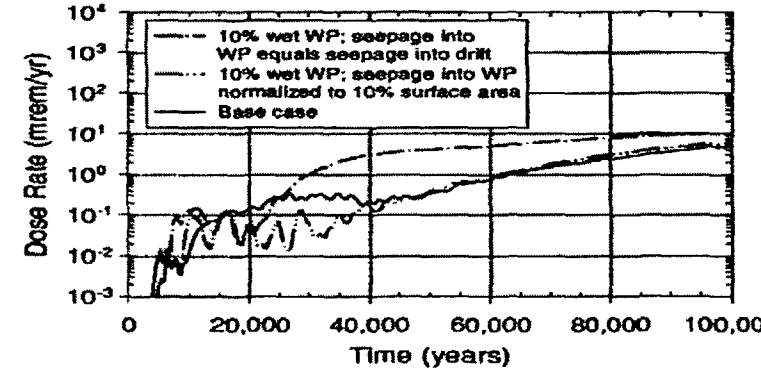


WHAT HAS HELPED NRC UNDERSTANDING OF VA

- **Plots of the Results of Sensitivity Analyses and of Alternative Conceptual Models**







WHAT HAS HELPED NRC UNDERSTANDING OF VA

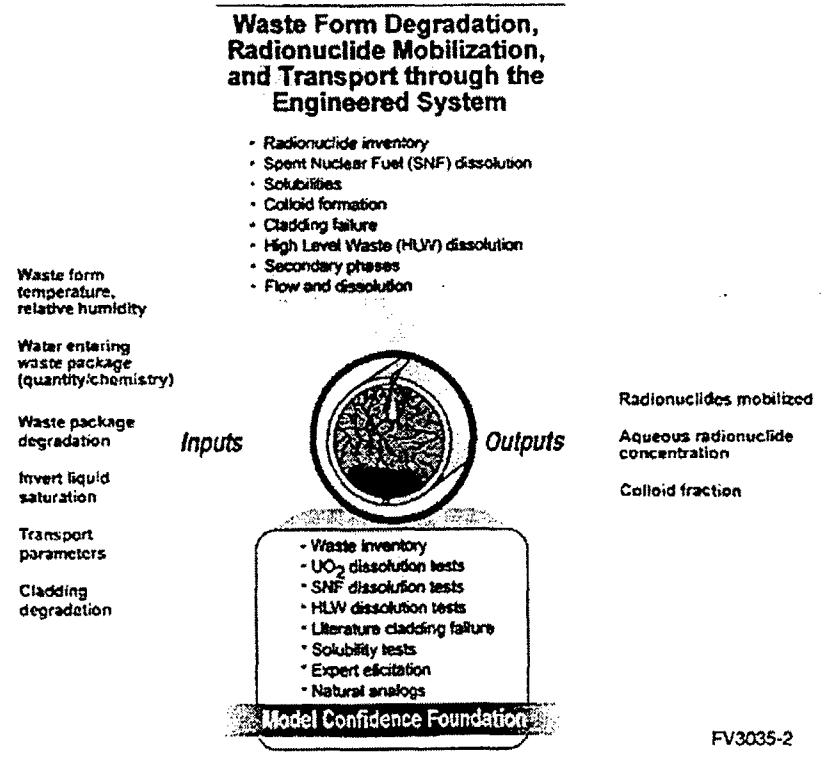
- **Tables That Provide a Summary of Abstraction Workshops**
- **Figures That Summarize Inputs and Outputs of TSPA-VA Components**

UNSATURATED ZONE FLOW ABSTRACTION/TESTING WORKSHOP
December 11–13, 1996, Albuquerque, NM
(CRWMS M&O 1997t)

PRIORITIZATION CRITERIA
- Does the issue have a strong effect on:
  - Percolation flux at the repository?
  - Seepage into the drift?
  - The partitioning of flow between the fractures and matrix?
- Will the issue be important to flow and transport below the repository?

Highest Priority Issues
- Infiltration and future climate
- Model calibration
- Lateral flow and perched water below the repository
- Flow channeling and seepage into the drift

Analysis Plans
- Sensitivity studies conducted on the site-scale model to determine abstraction methods for unsaturated zone flow
- Seepage into drifts under pre-waste-emplacement conditions
- Testing of perched-water concepts and their implications for TSPA-VA calculations
- Sub-grid-scale fractures and model calibration



AREAS WHERE THE VA COULD HAVE BEEN MORE TRANSPARENT AND TRACEABLE

- Information Flow From Components to the System Code
  - The Flow of Key Information Between the RIP Code and External Process Models Is Difficult to Trace
- Sampling of Uncertain Parameters Outside of the TSPA-VA Code
  - Difficult to Determine Whether Correlations Among the Sampled Parameters Have Been Accounted for Properly
  - Inadequate Sampling of Parameters Potentially Important to Performance

AREAS WHERE THE VA COULD HAVE BEEN MORE TRANSPARENT AND TRACEABLE

- Mathematical Basis for Lumped Parameters Used to Account for Complex Physical Processes Should Be Included, at Least in a Limited Manner, in the TSPA
  - Having to Refer to Technical Basis Document Exclusively to Trace the Basis for These Parameters Is Inconvenient
- It Would Be Useful If the VA Had Contained a Table Listing All Important Input Parameter Values and Distributions
  - This Would Make It Easier for NRC to Review and Easier for DOE to Check Numbers for Consistency

AREAS WHERE THE VA COULD HAVE BEEN MORE TRANSPARENT AND TRACEABLE

- **The Depth of the Description of the Modeling Approach for a System or Process Should Be Consistent With the Importance of That System or Process With Respect to Performance**

SUMMARY

- **The Transparency and Traceability of the TSPA-VA Is a Significant Improvement Over Previous Versions of the DOEs TSPAs**

- **Continued Dialog Between NRC and DOE Will Help to Improve the Transparency and Traceability of TSPA-LA Which Will Facilitate the NRC Review of the License Application**