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QA: N/A

MAY 09 2002

OVERNIGHT MAIL

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**TRANSMITTAL OF INFORMATION ADDRESSING KEY TECHNICAL ISSUE (KTI)
TOTAL SYSTEM PERFORMANCE ASSESSMENT AND INTEGRATION (TSPAI) 3.02**

The enclosure to this letter provides information to support completion of the KTI TSPAI Agreement Item 3.02.

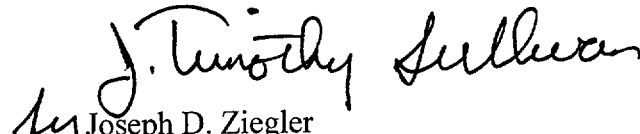
Specifically, this agreement item relates to providing the technical basis for using resampling of waste package general corrosion rates in the waste package degradation model for the Alloy 22 waste package outer barrier. The U.S. Nuclear Regulatory Commission (NRC) staff expressed concerns that resampling of waste package corrosion rates in the model might potentially underestimate the overall waste package corrosion rates, thus resulting in non-conservative waste package life times. The U.S. Department of Energy has since performed scoping evaluations using a modified waste package degradation (WAPDEG) model that effectively models the shell regions of the waste package with a single corrosion rate. A comparison of the results to those reported in the TSPA-Site Recommendation indicates that differences in the waste package failure times, due to sampling method, have negligible effect on waste package performance, and hence, mean dose rates, and that TSPAI 3.02 can be completed on this basis. The enclosure to this letter provides more detailed information to support completion of this agreement item.

Final documentation of the sampling of the waste package corrosion rate data for WAPDEG analysis of the waste package degradation and life times will be reflected in the next update of the document AMR-ANL-EBS-MD-000001, *WAPDEG Analysis of Waste Package and Drip Shield Degradation*, due to be issued in Fiscal Year 2003.

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This letter contains no additional regulatory commitments. Please direct any questions concerning this letter and its enclosure to Timothy C. Gunter at (702) 794-1343 or Paige R.Z. Russell at (702) 794-1315.


for Joseph D. Ziegler
Acting Assistant Manager, Office of
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OL&RC:TCG-1115

Enclosure:
Information to Support Closure of Total
System Performance Assessment Key
Technical Issue Agreement Item
TSPAI 3.02

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cc w/o encl: (continued)

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Enclosure

INFORMATION TO SUPPORT CLOSURE OF TOTAL SYSTEM PERFORMANCE ASSESSMENT KEY TECHNICAL ISSUE AGREEMENT ITEM TSPAI 3.02

The following information is provided to support closure of Total System Performance Assessment and Integration (TSPAI) Key Technical Issue (KTI) Agreement Item 3.02. This agreement item was reached during a Technical Exchange and Management Meeting on TSPAI KTI between the U. S. Nuclear Regulatory Commission (NRC) and the U. S. Department of Energy (DOE) on August 6-10, 2001. Specifically, the Agreement Item 3.02 states:

“Provide the technical basis for resampling the general corrosion rates and the quantification of the impact of resampling of general corrosion rates in revised documentation (ENG1.1.1). DOE will provide the technical basis for resampling the general corrosion rates and the quantification of the impact of resampling of general corrosion rates in an update to the WAPDEG Analysis of Waste Package and Drip Shield Degradation AMR (ANL-EBS-PA-000001). This AMR is expected to be available to NRC in FY 2003.”

This agreement item relates to resampling of general corrosion rates used in the TSPA-SR WAPDEG Model for the shell (non-lid) regions of the Alloy 22 waste package outer barrier. The NRC staff expressed concerns that resampling of waste package corrosion rates might result in underestimation of the effective overall waste package corrosion rates applied to the shell of the waste package, thus leading to potentially non-conservative waste package lifetimes. In the results presented for TSPA-SR, the failure of the closure lid weld regions by Stress Corrosion Cracking (SCC) dominates the waste package failure time (see, for example, Figures 21, 22, 36, and 37 of the *WAPDEG Analysis of Waste Package and Drip Shield Degradation, Reference 1*). As a result, the corrosion rates associated with the shell regions of the waste package outer barrier are of little consequence to the mean waste package failure distribution.

However to evaluate the potential impact of the resampling method, DOE has performed scoping evaluations using a modified WAPDEG Model such that effectively, the shell regions of the waste package are modeled with a single corrosion rate. For the shell regions of the waste package, the approach implemented in the modified WAPDEG Model is equivalent to modeling a single barrier. The first patch breach summary statistics from the TSPA-SR WAPDEG Model (Section 6.5.1 of Reference 1) and the modified WAPDEG Model are shown in the attached Figure 1. The solid curves in Figure 1 correspond to the modified WAPDEG Model (effectively not using resampling). The dotted curves in Figure 1 correspond to those in Figure 37 of Reference 1 (using resampling). As expected, the TSPA-SR WAPDEG Model first patch breach curves show less variability than do those of the modified WAPDEG Model. There is little difference between the first patch breach results of the two models and therefore little difference would be expected between the failure times distribution (and hence the mean dose rates) obtained from the two models. Thus, it is concluded that resampling has a negligible effect on waste package performance. The Project plans to use the modified WAPDEG model (effectively not using resampling) approach for the potential License Application.

A description of the sampling of the waste package corrosion rate for dose calculations will be contained in the next update of the document AMR: ANL-EBS-MD-000001, WAPDEG Analysis of Waste Package and Drip Shield Degradation, due to be issued in FY 03.

Reference 1:

CRWMS M&O 2000. *WAPDEG Analysis of Waste Package and Drip Shield Degradation*. ANL-EBS-PA-000001 REV 00 ICN 01. Las Vegas, Nevada: CRWMS M&O.

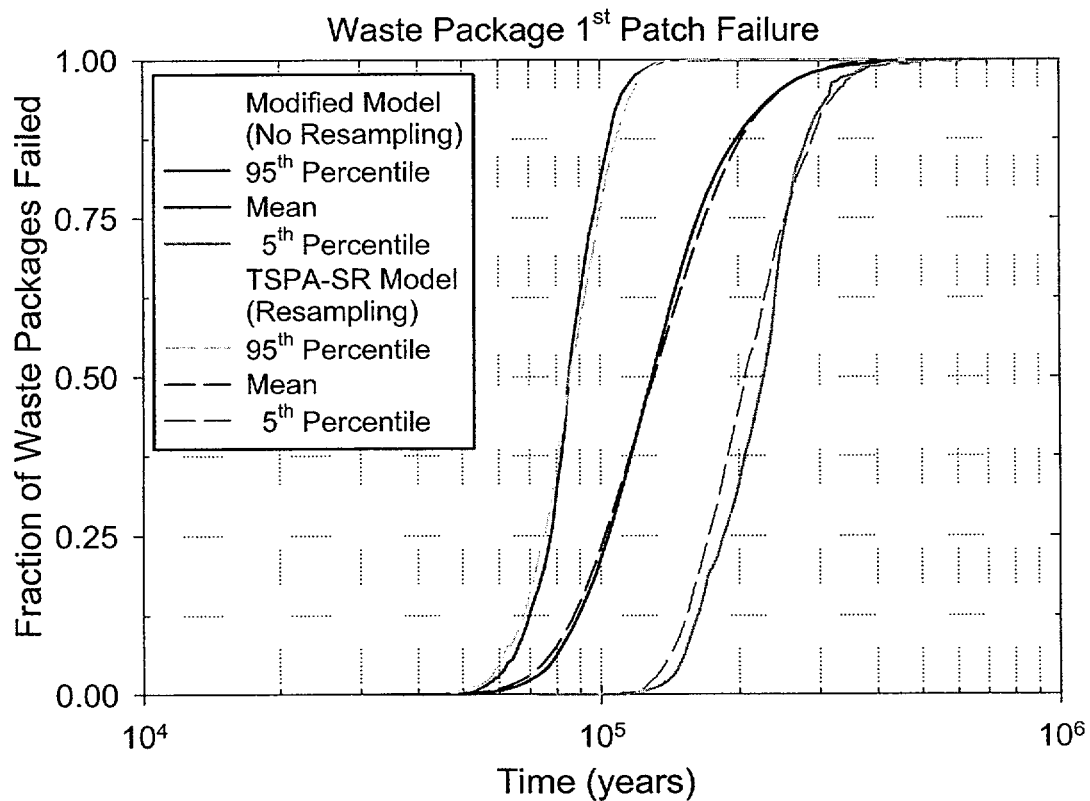


Figure 1. First Patch breach summary statistics from the modified WAPDEG model and the TSPA-SR WAPDEG model.