

BSC

Engineering Change Notice

1. QA: QA

2. Page 1 of 1

Complete only applicable items.

3. Document Identifier: CAL-EBS-MD-000030	4. Rev.: 00C	5. Title: Analysis of Mechanisms for Early Waste Package/Drip Shield Failure	6. ECN: 01
7. Reason for Change: CR#4183 documented an incorrect FEPs reference in the calculation CAL-EBS-MD-000030 Revision 00C, Analysis of Mechanisms for Early Waste Package/Drip Shield Failure. Table 21, page 100, lists FEP No. 1.1.08.00.0A as having been excluded in Section 6.4 of this report. This FEP was actually excluded in ANL-WIS-MD-000019, Revision 02, Features, Events, and Processes: System Level.			
8. Supersedes Change Document: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If, Yes, Change Doc.: <u>CAL-EBS-MD-000030-Rev.00C</u> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes			
9. Change Impact:			
Inputs Changed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Results Impacted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Assumptions Changed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Design Impacted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
10. Description of Change: (Address any "Yes" answers) Table 21, page 100 of CAL-EBS-MD-000030 Revision 00C, will be changed to remove the reference to FEP No. 1.1.08.00.0A having been excluded in this document. This change has no impact to the results of the calculation or the design and thus is being processed as an editorial change. The title of Table 21 will also be changed for clarification purposes and to correspond to Table 20. The new title will be: Table 21. Features, Events, and Processes Excluded (Screened Out) in TSPA-LA and Addressed in this Report.			
11. Originator: (Print/Sign/Date) Michael Russell <i>Michael Russell</i> 6/6/05			
Checker: (Print/Sign/Date) Kevin Mon <i>Kevin Mon</i> 6/6/05			
Approved: (Print/Sign/Date) David Stahl <i>David Stahl</i> 6/6/05			

specific information, design, and regulations. The approach for developing an initial list was documented in *The Development of Information Catalogued in REV00 of the YMP FEP Database* (Freeze et al. 2001). To support the TSPA-LA model, the FEP list (DTN: MO0407SEPFEPLA.000) was re-evaluated in accordance with *The Enhanced Plan for Features, Events, and Processes (FEPs) at Yucca Mountain* (BSC 2002, Section 3.2). Table 20 provides a list of FEPs that are included in the TSPA-LA models described in this calculation, and provides specific references to sections within this document. Table 21 provides a list of the FEPs that have been excluded. The summary of the disposition and the details of the exclusion of these FEPs are documented in *FEPs Screening of Processes and Issues in Drip Shield and Waste Package Degradation* (BSC 2004b).

Table 20. Features, Events, and Processes Included (Screened In) in TSPA-LA and Addressed in this Report

FEP No.	FEP Name	Sections Where Disposition is Described
2.1.03.08.0A	Early Failure of Waste Package	Section 6.2

Table 21. Features, Events, and Processes Excluded (Screened Out) in TSPA-LA and Addressed in this Report

FEP No.	FEP Name	Sections Where Disposition is Described
2.1.03.08.0B	Early Failure of Drip Shield	Section 6.3

7. CONCLUSIONS

The first part of this analysis (Section 6.1) performed a review of available literature on defect-related early failures of welded metallic components. Types of components examined included boilers and pressure vessels, nuclear fuel rods, underground storage tanks, radioactive-cesium capsules, and dry-storage casks for spent nuclear fuel. The fractions of the total populations that failed due to defect-related causes during the intended lifetime of the components were generally in the range of 10^{-3} to 10^{-6} per container. In most cases, defects that led to failure of the component required an additional stimulus to cause failure (i.e., the component was not failed when it was placed into service). In fact, there were several examples that indicated that even commercial standards of quality control could reduce the rate of initially failed components well below 10^{-4} per container.

Twelve generic types of defects that could cause early failures in the components examined were identified. These are weld flaws, base metal flaws, improper weld material, improper base metal, improper heat treatment, improper weld flux material, poor weld joint design, contaminants, mislocated welds, missing welds, handling or installation damage, and an administrative error resulting in an unanticipated environment. However, the duration of time required for a defect of a given type and severity to lead to failure is highly dependent on the service conditions to which the component is subjected. As a result, there is insufficient information available in the literature to defensibly relate the cumulative effect of the environment, or stresses to which the examined components were subjected, to the waste package or drip shield. In addition, factors such as the differing degrees of inspection and the