



Model Error Resolution Document

QA: QA
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Complete only applicable items.

INITIATION

1. Originator: Russell Jarek	2. Date: 4/10/08	3. ERD No. ANL-EBS-MD-000004 ERD 01
4. Document Identifier: ANL-EBS-MD-000004 REV 02 AD 01	5. Document Title: General Corrosion and Localized Corrosion of the Drip Shield	
6. Description of and Justification for Change (Identify applicable CRs and TBVs):		
<p>The following correction is posted to correct the condition identified in CR 11033.</p> <p>Summary Information: Section 6.7.2 (Microbially Influenced Corrosion) of the subject report contains the following:</p> <p style="padding-left: 40px;">Hydrogen peroxide maintains a low pH (< 3) near the metal by oxidizing metal cations that then undergo hydrolysis. These chemical changes can lead to ennoblement (a shift of the corrosion potential to more positive values) of titanium by up to 500 mV (Shoesmith and Ikeda 1997 [DIRS 151179], Section 6).</p> <p>The cited source document does not support the implication that the low pH conditions due to a biofilm will raise the corrosion potential of titanium by 500 mV.</p> <p>Correction: To accurately represent the information presented in the cited source document, the text quoted above from Section 6.7.2 is replaced with the following:</p> <p style="padding-left: 40px;">Hydrogen peroxide maintains a low pH (< 3) near the metal by oxidizing metal cations that then undergo hydrolysis. These chemical changes can lead to of the ennoblement of the corrosion potentials (i.e., to more positive values) of high molybdenum stainless steels and superalloys by as much as 500 mV, as summarized by Shoesmith and Ikeda (1997 [DIRS 151179], Section 6 and Figure 16). If microbial processes on titanium also result in a similar shift in titanium corrosion potentials (in the range of +500 mV), such a shift would be insignificant to its localized corrosion susceptibility.</p> <p>Impact Evaluation: The correction to the text presented here does not impact the general conclusion of Section 6.7.2 (i.e., that microbially influenced corrosion will have no significant effect on either general or localized corrosion processes of titanium alloys under the repository exposure conditions). There is only a single document (<i>Features, Events, and Processes for the Total System Performance Assessment: Analyses</i>, ANL-WIS-MD-000027 REV 00) that cites Section 6.7.2 of the subject report as direct input; the information presented in that document is more consistent with the corrected text presented here than the original text, and as such there is no impact to that document.</p> <p>Other documents use a direct input from the subject report that are not related to Section 6.7.2, and they are confirmed to be unaffected by this ERD: <i>Postclosure Nuclear Safety Design Bases</i> (ANL-WIS-MD-000024 REV 01) and <i>Seismic Consequence Abstraction</i> (MDL-WIS-PA-000003 REV 03).</p>		

CONCURRENCE

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APPROVAL

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