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## Detailed Status Information

<b>Manuscript #</b>	<a href="#">E-SYMP-04-45-A</a>
<b>Current Revision #</b>	0
<b>Submission Date</b>	2004-02-18
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<b>Title</b>	Risk Assessment of Uniform Corrosion and Localized Corrosion of Alloy 22
<b>Manuscript Type</b>	Symposium (Effect of Processing on Materials Properties for Nuclear Waste Disposition)
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<b>Abstract</b>	The risk associated with the performance of Alloy 22 waste package (WP) in the potential repository for high-level nuclear waste at Yucca Mountain was assessed using the NRC's Total- system Performance Assessment (TPA) Code. The high temperature (above 100 °C) deliquescence relative humidity from mixed salt deposits on the WP surface was evaluated by lowering the critical relative humidity (RH <sub>critical</sub> ) for aqueous corrosion to (35 - 60) pct. For the base case values of the critical potential for localized corrosion, the estimated dose increased from 0.05 to 1 mrem/year in 10,000 years by altering RH <sub>critical</sub> . For the modified case the estimated dose increased to 3.8 mrem/year at 10,000 years without lowering RH <sub>critical</sub> . With the addition of nitrate as an inhibitor, the estimated dose decreased to 0.03 mrem/year at 10,000 years. Giving credit to the remaining surface area of the WP after failure by localized corrosion reduces the estimated dose from 4 mrem/year to 0.4 mrem/year. Anodic sulphur segregation at the interface of metal and passive film and subsequent spalling of passive film may enhance uniform corrosion. The cyclic process of fast active corrosion upon sulfur segregation followed by slow passive corrosion upon repassivation is unlikely to reduce significantly the WP lifetime.
<b>Key Reader</b>	Assigned
<b>Key Words</b>	Alloy 22, uniform corrosion, localized corrosion, nuclear waste disposition, risk assessment, passivity

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