

**Waste Package Materials Performance  
Peer Review Panel**

**Closing Remarks**

*Presented by*

**Peer Panel on Waste Package Materials Performance  
Chairman, Joe H. Payer**

*Presented to*

**U.S. Department of Energy (DOE)  
Bechtel SAIC Company, LLC (BSC)**

**March 18-19, 2002  
Las Vegas, NV**

**Peer Review  
of  
Waste Package Materials Performance**

The U.S. Department of Energy (DOE) requested Bechtel SAIC Company, LLC (BSC) to conduct a consensus peer review of the waste package materials performance.

Reviewed the technical basis for prediction of the long-term performance of waste package materials

Panel submitted Final Report to BSC/DOE on February 28, 2002; report is posted on ymp.gov website

Panel's formal work is complete; members are available for follow-up activities through September 2002

## Content of the Final Report

### **Executive Summary**

### **Introduction**

### **Overview Sections**

- o Section 2 provides the Panel's overall findings, presents technical issues that need to be resolved
- o Section 3 presents a summary of the Panel's review and findings for specific degradation modes and factors

### **Detailed Sections**

- o Section 4 through Section 10 provide information to support the findings and recommendations

### **Contributing Factors**

- o Section 11 presents summaries drawn from Special Topic Reports (those reports to be issued in March 2002)

**Compilation of Special Topic Reports  
to be issued in March 2002**

**Design And Fabrication Factors**

**Fabrication Processes and Metallurgy: Sub-Panel Meeting; F. Wong**

**Development of Weld Procedures; J. Lippold**

**Composition Effects within the Chemical Specification for Alloy 22;  
S. Floreen**

**Residual Stress in Stainless Steel Cylinders from Quenching; C.  
Jaske**

**Corrosion Product Passive Films: Effect of Surface Finish; R. Rapp**

**Compilation of Special Topic Reports  
to be issued in March 2002**

**Corrosion, Chemistry and Metallurgy Factors**

**Localized Corrosion: Phenomenology and Controlling Parameters; G. S. Frankel**

**Water Composition within Yucca Mountain; K. Nagy**

**Localized Corrosion: Chemistry and Radiolysis Effects; A. Turnbull**

**Passive Films and the Long-Term Uniform Corrosion Resistance of Alloy 22; T. Devine**

**Inhibition of Localized Corrosion by Non-Halide Anions; R. Newman**

**Passivity-Induced Ennoblement; G. S. Frankel**

**Localized Corrosion: Temperature Effects; R. Newman**

**Development in the Concept of Repassivation Potential as a Measure of Crevice Corrosion Susceptibility; T. Shibata**

**The Critical Potential for Localized Corrosion; M. Akashi**

**Compilation of Special Topic Reports  
to be issued in March 2002**

**Corrosion, Chemistry and Metallurgy Factors**

**Formation of an Aqueous Environment from Condensation in Dust Layer; R. Frankenthal**

**Statistical and Stochastic Aspects of Corrosion Life Prediction; T. Shibata**

**Microbiologically Influenced Corrosion; S. Dexter**

**Radiation Effects; R. Jones**

**High-Temperature Corrosion Related to Waste Package Corrosion; R. Rapp**

**Interfacial Segregation in Nickel Base Alloys; C. Briant**

**Comments on Metallurgy and Fabrication of Alloy 22 Waste Packages; S. Floreen**

**Effects of Stress Relaxation on Stress Mitigation; R. Jones**

**Corrosion of Nickel Base Alloys in Flue Gas Desulfurization Systems; J. Beavers**

**Atmospheric Corrosion of Nickel Base Alloys; J. Beavers**

**Corrosion Of Stainless Alloys And Titanium In Peroxide Solutions; R. Newman**

## Peer Review Panel Members

Dr. Joe H. Payer, Case Western Reserve University; Chairperson  
Dr. John A. Beavers, CC Technologies Laboratories, Inc.  
Dr. Thomas M. Devine, Jr., University of California, Berkeley  
Dr. Gerald S. Frankel, Ohio State University  
Dr. Russell H. Jones, Battelle-Northwest  
Dr. Robert G. Kelly, University of Virginia  
Dr. Ronald M. Latanision, Massachusetts Institute of Technology

*Panel member expertise in the materials science and engineering,  
corrosion, and prediction of materials performance*

### *Subject Matter Experts:*

- o *~15 U.S. & International to assist the Panel*
- o *Expertise includes passivity, localized corrosion, geochemistry, hydrogeology, physical metallurgy, welding, oxidation*

## Acknowledgements

- U.S. Department of Energy
- Bechtel SAIC
- Lawrence Livermore National Laboratory
- Subject Matter Experts
- U.S. Nuclear Regulatory Commission
- Center for Nuclear Waste Regulatory Analyses
- U.S. Nuclear Waste Technical Review Board
- State of Nevada Agency for Nuclear Projects and its contractors

*The Panel had cooperative and open discussions with all throughout the conduct of this review.*