

Peer Panel on Waste Package Materials Performance

Overview of DOE Peer Review of Waste Package Materials Performance

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

Presented to
U.S. Nuclear Waste Technical Review Board
Full Board Meeting
May 8-9, 2001
Washington, DC

May 2001

Peer Panel on Waste Package Materials Performance

Peer Review of Waste Package Materials Performance

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

Panel recommendations will be provided to the DOE to enhance confidence in the current technical basis and the planned experimental and modeling program for the prediction of long-term waste package performance.

May 2001

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Overall Objectives

Review current bases for predicting long-term performance

- o corrosion performance of Alloy 22 waste package and Ti Gr 7 drip shield materials
- o on-going and planned experimental and modeling program

To increase confidence in long-term performance projections

Assess the adequacy of the experimental and modeling program

- o recommend any augmentations of existing or planned tasks
- o Recommend additional new tasks that would significantly strengthen the program

Prepare an Interim and a Final Peer Review Report

- o Present Panel's assessment, findings and conclusions
- o to assist DOE in prioritizing future work plans

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Peer Panel on Waste Package Materials Performance

Sub-Issues To Be Addressed

- o Assessment of potential degradation modes
- o Long term performance of passive metals
- o Composition of waters in contact with waste package materials
- o Understanding and control of crevice corrosion and pitting
- o Understanding and control of stress corrosion cracking

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Review Criteria

- o Validity of basic assumptions
- o Alternate interpretations
- o Appropriateness and Limitations of methods and implementing documents used to complete the work product under review
- o Adequacy of application
- o Accuracy of calculations
- o Validity of conclusions
- o Uncertainty of results and impact if incorrect

Emphasis is on the understanding and review of the technical basis for long term performance

May 2001

Peer Panel on Waste Package Materials Performance

Peer Review Panel Members

Chairperson - Dr. Joe H. Payer, Case Western Reserve University
 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

Technical expertise in the materials science and engineering disciplines including metallurgy, corrosion processes, material performance, long-term passive film stability, and experimental and modeling programs necessary to predict long-term performance

May 2001

Subject Matter Experts

Subject Matter Expert (SME) to provide technical advice to the Panel members on specific aspects of the review

SME may serve the Panel members where technical issues arise beyond the established expertise of the Panel members or where the volume of material to be reviewed requires technical support.

SME will not have permanent standing on the Panel and will report their comments, concerns, conclusions, and recommendations through the appropriate Panel members

The Panel members will retain responsibility for assimilating all SME work into the reports

-12 Experts: U.S. & International; passivity, localized corrosion, geochemistry, hydrogeology, physical metallurgy, welding, oxidation, nickel alloys

Process and Procedures

Members of the Panel will work interactively with the Contractor and others who can contribute to the Panel's work

Panel members can request any information they deem necessary to the success of the review

Panel members will attend project meetings, technical exchanges, and workshops, as needed

Panel members solicit advice concerning materials relevant to the review and welcome input from any group or individual

Meetings and Interactions

Open Meetings (a) Introductory meeting, (b) Interim Report meeting and (c) Final Report meeting

- o To present findings to DOE/Contractor.
- o Interactions at these meetings will be generally confined to the Panel members and those directly addressing them.
- o Time will be scheduled at each open meeting for the Panel to receive comments and questions from the public

All other functions of the Panel, collectively and individually, will be treated as closed working sessions

Panel will prepare and deliver to the Contractor an Interim Report and a Final Peer Review Report

- o Present comments, concerns, conclusions, and recommendations

Review Schedule

February-April 2001

Select Peer Review Panel and Subject Matter Experts. Develop Peer Review Plan including specific objectives

May 2001

Peer Review Introductory Meeting (May 23) to include presentations by the Project. Open meeting on May 23 in Las Vegas, NV

June-August 2001

Conduct Peer Review

September 2001

Issue Interim Report and present Interim Report Findings to DOE/Contractor. Open meeting tentatively on September 10 in Las Vegas, NV

October-January 2001

Complete Peer Review

February 2002

Issue Final Report and present Final Report Findings to DOE/Contractor. Open meeting in Las Vegas, NV

March/April 2002

Prepare and issue Peer Review Evaluation Report (Contractor)