Department of Energy
Office of Civilian Radioactive Waste Management
1551 Hillshire Drive
Las Vegas, NV 89134-6321

QA: N/A

APR 30 2009

OVERNIGHT MAIL

RECEIVED MAY 01 2009

B. John Garrick, Ph.D.
Chairman
Nuclear Waste Technical Review Board
2300 Clarendon Boulevard, Suite 1300
Arlington, VA 22201-3367

Dear Dr. Garrick:

It has been called to my attention that an error exists in information that was presented to the Nuclear Waste Technical Review Board on May 29, 2008. The enclosed letter from Peter Swift of Sandia National Laboratories, dated April 21, 2009, explains the error detected and provides corrected pages for the presentation, as well as background information. The enclosed letter also refers to a U.S. Department of Energy response to a U.S. Nuclear Regulatory Commission Request for Additional Information (RAI) that is related to this error and gives information regarding the retrieval of this RAI for your use.

If you require further clarification regarding this matter, please contact me at (702) 794-1408, or Abraham E. Van Luik at (702) 794-1424.

Sincerely,

J. Russell Dyer, Acting Director
Office of Technical Management

Enclosure:
As stated

Sandia National Laboratories

Operated for the U.S. Department of Energy's
National Nuclear Security Administration
by **Sandia Corporation**

P.O. Box 5800
Albuquerque, NM 87185-0773

Peter Swift
Lead Laboratory Chief Scientist
Yucca Mountain Project
Organization 06780

April 21, 2009

J. Russell Dyer
Acting Director, Office of Technical Management
U. S. Department of Energy
Office of Civilian Radioactive Waste Management
1551 Hillshire Drive
Las Vegas, Nevada 89134-6321

SUBJECT: CONTRACT NO. DE-AC04-94AL-85000 – CORRECTION TO ERROR IN INFORMATION PRESENTED TO THE NUCLEAR WASTE TECHNICAL REVIEW BOARD (NWTRB) ON MAY 29, 2008

I am writing to call your attention to an error in information I presented to the NWTRB on May 29, 2008. Near the end of my presentation of "Total System Performance Assessment Modeling Approach and Overview of Results," I provided a brief discussion of the treatment of localized corrosion in the TSPA, as shown on slides 34, 35, and 36 of my presentation. Subsequent work has identified an error in the Localized Corrosion Initiation Uncertainty Analysis documented in Appendix O of the Total System Performance Assessment Model/Analysis for the License Application (TSPA-LA report, MDL-WIS-000005, REV 00 AD01). The figure shown on Slide 35 of my presentation to the Board was incorrect, as was a statement on Slide 34 of a quantitative result from the Appendix O analyses. Corrected copies of these two slides are attached.

The correction changes the value calculated by the TSPA localized corrosion initiation analysis for the percentage of locations within the repository where environmental conditions could be favorable for the initiation of localized corrosion on Alloy 22, assuming that drip shields had failed. As reported in both my presentation to the Board and the TSPA-LA report, approximately 10% of the waste package locations could have environmental conditions favorable to the initiation of localized corrosion. Corrected results, as shown in the corrected copies of Slides 34 and 35, indicate approximately 34% of locations could have such conditions approximately 500 years after permanent closure of the repository. Conditions at later times, for example, at 5000 years, are unchanged.

The correction results from the implementation of the "salt separation" model in an updated set of localized corrosion initiation analyses. Although text in the TSPA-LA report (MDL-WIS-000005 REV 00 AD01, section 6.3.4.3.2) and the License Application Safety Analysis Report (the SAR, DOE/RW-0573 Rev 0, Section 2.3.5.5.1) describes this model, which allows chloride concentrations to increase due to physical separation of dissolved and precipitated phases as seepage water evaporates during flow on a hot metal surface, as having been used in localized corrosion analyses, the model had not been implemented in the calculations reported in Appendix O of the TSPA-LA report.

This correction has no impact on any estimates of mean annual dose to the reasonably maximally exposed individual provided to the Board on slides 13 through 22 of my May 29, 2008 presentation and documented in the TSPA-LA report and SAR. This absence of an impact on mean dose occurs because, regardless of calculated environmental conditions, localized corrosion of Alloy 22 in seepage water does not initiate as long as drip shields are intact and seepage does not reach the waste packages. For the drip shield early failure modeling case, which evaluates consequences of drip shield failures during the first 10,000 years when environmental conditions have the potential to initiate localized corrosion, the TSPA implements a conservative bounding assumption that all waste packages encountering seepage are assumed to fail completely and immediately by localized corrosion. This assumption effectively bounds the impact of the error introduced by the failure to implement the salt separation model in the localized corrosion initiation analysis. Potential impacts on other modeling cases in which drip shields could fail during the first 10,000 years (i.e., igneous intrusion, seismic ground motion, and fault displacement) are similarly shown to be negligible.

This error has been identified and addressed through the Project's corrective action program, and has been reported in full to the Nuclear Regulatory Commission. The Department of Energy's response to a related Request for Additional Information from the NRC is available in the NRC's ADAMS database (http://www.nrc.gov/reading-rm/adams/web-based.html), accession numbers ML090980528 and ML090980532 for the transmittal letter and enclosure, respectively.

Sincerely,

Peter Swift

PS/dsf

Enclosure

09_229_YMP-LL_04-21-2009

U.S. Department of Energy
Office of Civilian Radioactive Waste Management

www.ocrwm.doe.gov

Total System Performance Assessment: Modeling Approach and Overview of Results

Presented to:
Nuclear Waste Technical Review Board

Presented by:
Peter Swift
Lead Laboratory Chief Scientist
Sandia National Laboratories

May 29, 2008
Las Vegas, Nevada

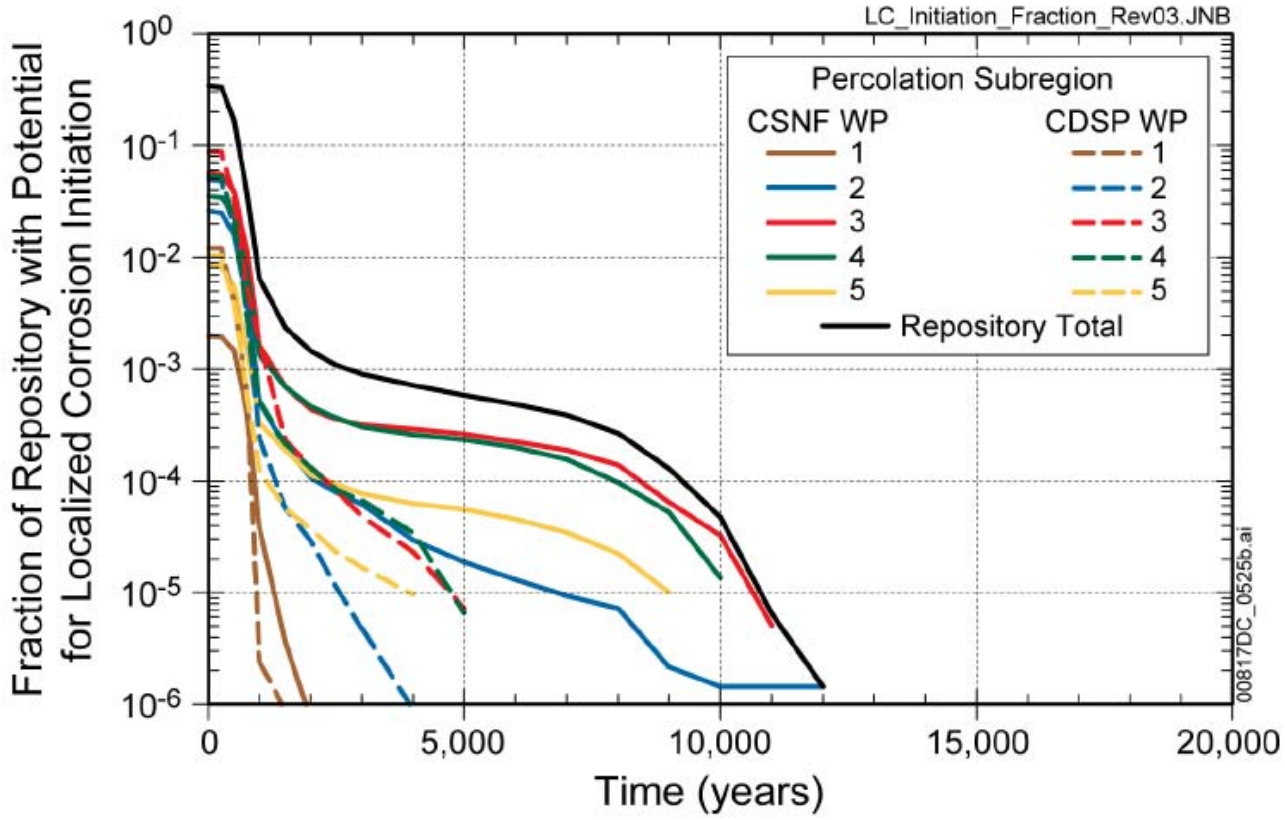
Corrected copies of Slides 34 and 35

April 16, 2009

Localized Corrosion of Alloy-22

- **Environmental conditions for LC initiation are analyzed using TSPA model independent of the drip shield (MDL-WIS-PA-000005 REV 003 AD 01, Appendix 0)**
  - **Temperature, pH, and nitrate/chloride ratios modeled as a function of time for 3,264 nodes in repository**
  - **The potential for LC peaks in the first few hundred years when temperatures are highest**
    - **LC conditions could exist at approximately 34 % of modeled WP locations at early time**
    - **By 5000 years, less than 0.1 % of WP locations have LC conditions**
    - **LC conditions do not occur at any locations after 12,000 years**
- **LC is included by bounding assumptions for modeling cases in which the DS is compromised before 12,000 years**
  - **For DS Early Failure case, failure of WP due to LC is assumed for all seeping locations, regardless of actual environment**
  - **For Seismic Fault Displacement, WP is assumed to be sheared by the fault displacement event**
  - **For Igneous modeling cases, WPs are assumed to be fully compromised by the event**

Localized Corrosion in TSPA (cont.)



Source: Output DTN: MO0709TSPALOCO.000 [DIRS 185808].

Fraction of locations in each percolation subregion with the potential for localized corrosion (MDL-WIS-000005 REV 00 AD01 Fig O-2)