



UNITED STATES  
NUCLEAR WASTE TECHNICAL REVIEW BOARD  
2300 Clarendon Boulevard, Suite 1300  
Arlington, VA 22201  
703-235-4473

**AGENDA**  
**Fall 2021 Board Meeting**  
*November 3–4, 2021*  
*Virtual Meeting*

<https://preconvirtual.com/nwtrb-gov-11-03-21/>

**Wednesday, November 3, 2021**

**12:00 p.m. EDT**     **Call to Order and Introductory Statement**  
*Jean Bahr, Board Chair*

**12:15 p.m. EDT**     **Update on DOE’s Spent Fuel and Waste Disposition Program, including Interim Storage Activities**  
*William Boyle and Alisa Trunzo, U.S. DOE, Office of Nuclear Energy*

*12:30 p.m. EDT*     *Questions, discussion*

**12:45 p.m. EDT**     **Geologic Disposal Safety Assessment (GDSA) Overview**  
*Emily Stein, Sandia National Laboratories*

TOPICS/QUESTIONS TO BE ADDRESSED:

- Briefly summarize the evolution of DOE's GDSA capability.
- What are the specific goals for developing the GDSA Framework and which stages of the repository program do you envision it being used?
- What are the near-term and long-term priorities for GDSA work? How were these initially determined and subsequently updated?
- What are the significant challenges encountered to date in developing the GDSA Framework and how have these been or will be addressed?

*1:25 p.m. EDT*     *Questions, discussion*

**1:45 p.m. EDT**     **Break**

**ADVANCED SIMULATION — FOUNDATIONAL CAPABILITY**

**2:05 p.m. EDT**     **GDSA Framework**  
*Paul Mariner, Sandia National Laboratories*

TOPICS/QUESTIONS TO BE ADDRESSED:

- Describe the conceptual model framework.
- How do you determine the level of detail necessary to represent a feature, event, or process in the GDSA Framework?

Note: The questions have been provided to the speakers in advance of the meeting to convey the Board’s primary interests in the agenda topics and to aid in focusing the presentations.

- Describe the approaches that have been considered for efficiently integrating complex features, events, and processes into the GDSA Framework.
- How do you take account of complex features, events, and processes that can be addressed by engineering/design features, engineered barrier material properties, or assigned safety functions, which would make redundant their inclusion in the GDSA model?

2:45 p.m. EDT *Questions, discussion*

**3:05 p.m. EDT**

**PFLOTRAN**

*Michael Nole, Sandia National Laboratories*

TOPICS/QUESTIONS TO BE ADDRESSED:

- Describe the PFLOTRAN-based computational framework.
- What are the major accomplishments in enhancing the original PFLOTRAN code?
- What are the strengths and limitations of the PFLOTRAN code in the context of GDSA?
- How are uncertainties in models and model parameters quantified?
- What are the plans for verification and validation of the GDSA codes and models?

3:25 p.m. EDT *Questions, discussion*

**ADVANCED SIMULATION — PROCESS MODEL INTEGRATION**

TOPICS/QUESTIONS TO BE ADDRESSED:

- Describe examples of how important features, events, and processes are integrated into the GDSA Framework and the basis for selecting the approach taken to integrate them.
- What future capabilities do you plan to add to these examples and what are the bases/criteria for determining the need to add these capabilities?

**3:40 p.m. EDT**

**a) dfnWorks (preprocessor)**

*Jeffrey Hyman, Los Alamos National Laboratory*

4:00 p.m. EDT

*Questions, discussion*

**4:10 p.m. EDT**

**b) Integration of the Fuel Matrix Degradation Model (embedded)**

*Paul Mariner, Sandia National Laboratories*

4:30 p.m. EDT

*Questions, discussion*

**4:40 p.m. EDT**

**Public Comments**

**5:00 p.m. EDT**

**Adjourn Day 1**

## Thursday, November 4, 2021

**12:00 p.m. EDT**    **Call to Order**  
*Jean Bahr, Board Chair*

### **ADVANCED SIMULATION — PROCESS MODEL INTEGRATION (Continued from Day 1)**

**12:05 p.m. EDT**    **c) Biosphere Model (postprocessor)**  
*Caitlin Condon, Pacific Northwest National Laboratory*

*12:25 p.m. EDT*    *Questions, discussion*

**12:35 p.m. EDT**    **NRC's Development and Use of Performance Assessment**  
*Tim McCartin and David Esh, U.S. Nuclear Regulatory Commission*

#### TOPICS/QUESTIONS TO BE ADDRESSED:

- What are the important aspects that need to be considered in developing a performance assessment model?
- Irrespective of regulations, how do you determine the level of detail necessary to represent a features, events, and processes in performance assessment?
- What were the significant challenges encountered in your performance assessment code development work and how were those addressed?
- How were performance assessment development priorities initially determined and subsequently updated?

*1:05 p.m. EDT*    *Questions, discussion*

**1:25 p.m. EDT**    **Environmental Safety Case Models Supporting Geological Disposal of the UK's Radioactive Waste**  
*Sarah Vines, Radioactive Waste Management (U.K.)*

#### TOPICS/QUESTIONS TO BE ADDRESSED:

- What are the objectives of and strategy for performance assessment model development in the U.K.?
- What level of complexity was incorporated into the performance assessment model, and how was this decided?
- What were the significant and unexpected challenges encountered to date in developing the performance assessment model and how have these been or will be addressed?
- What information, if any, from performance assessment work in other countries were taken into account in developing U.K.'s performance assessment model?

*1:55 p.m. EDT*    *Questions, discussion*

**2:15 p.m. EDT**    **Break**

**2:35 p.m. EDT**    **Uncertainty and Sensitivity Analysis (U/SA)**  
*Laura Swiler, Sandia National Laboratories*

#### TOPICS/QUESTIONS TO BE ADDRESSED:

- What are the objectives and strategy for developing uncertainty and sensitivity analysis tools for GDSA Framework?
- What uncertainty quantification and sensitivity analysis tools have been incorporated into GDSA Framework and what additional uncertainty quantification /sensitivity analysis tools would enhance the uncertainty quantification /sensitivity analysis capability of GDSA Framework?
- Describe examples of how these uncertainty quantification /sensitivity analysis tools have been applied to reference case simulations.

3:05 p.m. EDT *Questions, discussion*

**3:25 p.m. EDT Reference Case Simulation**

*Tara LaForce (w/Emily Stein), Sandia National Laboratories*

TOPICS/QUESTIONS TO BE ADDRESSED:

- Describe the reference cases that have been developed and evaluated to date.
- What is the process for features, events, and processes screening for the reference cases?
- What repository and barrier performance metrics are used?
- What is the approach to evaluating sensitivity of model results to model parameters?
- What are the main conclusions from the PA simulations conducted to date using these reference cases?

3:55 p.m. EDT *Questions, discussion*

**4:15 p.m. EDT DECOVALEX Task F, A Case Study in Integrating Insight and Experience from the International Community in GDSA**

*Emily Stein, Sandia National Laboratories*

TOPICS/QUESTIONS TO BE ADDRESSED:

- What are the objectives of Decovalex Task F and how will these objectives be accomplished?
- How is DOE's participation in this task useful in the development of GDSA Framework?

4:35 p.m. EDT *Questions, discussion*

**4:50 p.m. EDT Public Comments**

**5:00 p.m. EDT Adjourn Public Meeting**