



TANK WASTE CORPORATE BOARD NEWSLETTER

UPCOMING EVENTS:

**Tank Waste Corporate Board
Oak Ridge National Laboratory
Oak Ridge, Tennessee
28 – 29 July 2009**

The Board meeting will be preceded by a tour of the Radiochemical Engineering and Development Center on the afternoon of Tuesday, 28 July, and the meeting is planned for a full day on Wednesday, 29 July.

Agenda Items include:

- Future Directions for DOE Office of Nuclear Energy
- Robotic Arm for Tank Cleaning
- AREVA Mobile Hot Cell
- Integrated Project Team Report
- DOE Nuclear Safety Research and Development Coordinating Committee
- Melton Valley Clean-Up: Lessons Learned
- Chemical Cleaning of Waste Tanks at Savannah River – F Tank Farm Closure Project
- Structural Integrity of Single Shell Tanks
- Report from the Performance Assessment Community of Practice Technical Exchange Meeting

The leadership of the High-Level Waste Corporate Board is considering changing the Board's name to the Tank Waste Corporate Board to better reflect those items that come before the Board. This change currently is under consideration by the Board members.

3 June 2009

News from the Tank Waste Corporate Board Meeting of 9 March 2009 in Phoenix, Arizona

Welcome and Introduction

Mark Gilbertson

Deputy Assistant Secretary, Office of Engineering and Technology
Mark started the meeting with a discussion of budgets, both FY09 and FY10. He also mentioned the influx of funding from the American Recovery and Reinvestment Act of 2009 (also known as stimulus funding). He next discussed some of the notable successes we have had over the last year. These include modeling, groundwater cleanup, continuing to establish best practices, international collaborations safety records, and the coupled accomplishments of saving money and accelerating schedule. He then discussed the Final Report on the Engineering and Technology Roadmap from the National Academy of Sciences. Major conclusions from this report are that the Roadmap is a good start but it should be considered a living document and updated as necessary. This report is available on the National Academy Press website ([NAS report](#)). Other comments by the National Academy are that the Roadmap should have milestones, that Office of Engineering and Technology should work to leverage the output of other organizations, and work to fill gaps in the Roadmap identified in the Report. Mark also discussed the Office of Engineering and Technology's Annual Report, which is available on Office of Engineering and Technology's website (http://www.em.doe.gov/pdfs/AR_Final_Proof.pdf). Mark was able to summarize this report by saying, "The Office of Engineering and Technology has done well at matching the effort to the challenge."

Overview of Integrated Waste Treatment Unit

Jan Hagers, Assistant Manager for Facility and Material Disposition, DOE-Idaho

The mission of the Integrated Waste Treatment Unit (IWTU) is to provide treatment of 900,000 gallons of tank farm waste (also called sodium bearing waste, SBW) stored at the Idaho Tank Farm Facility to a stable waste form suitable for disposition at the Waste Isolation Pilot Plant (WIPP). The treatment process is steam reforming which destroys nitric acid, nitrates, and organic materials. The steam reforming unit consists of several subsystems: waste transfer, denitration / mineralization reformer, carbon reduction reformer, off-gas handling, additive feed system, product transfer system,

**Performance Assessment
Community of Practice
Technical Exchange Meeting
Salt Lake City, Utah
13 – 14 July 2009**

Objective: The purpose of this technical exchange is to understand the current state-of-practice and reduce uncertainty in models used to estimate the performance of the engineered systems for environmental assessments. The engineered system is defined to include the waste forms, engineered barriers, and the near field physical-chemical interactions of these systems with the immediate surroundings. The agenda includes:

- DOE HQ perspectives on PAs
- IAEA Activities on Safety Assessment and Radioactive Waste Management
- NRC perspectives and approaches to PA modeling of source terms
- Overview of PA modeling and role of models for the engineered barrier systems
- State of the Practice: How were the engineered systems modeled for the F-Tank Farm PA?
- Performance and simulation of a low-level waste disposal vault (Spain)
- Modeling release from different waste forms
- Modeling Performance and Degradation of Barriers and Barrier Materials
- Composite Systems
- Approaches used in Assessing Engineered Systems in Geologic Repositories
- International Repository Approach (Belgium?)
- Integration and Uncertainty
- Linkages between the source term elements, source terms and transport models: Saltstone
- Linkages between the source term elements, source terms and transport models: SS Tanks

Contacts:

Logistics - Christina Rado,
crado@CRESP.org,
(615) 322-6405

Technical:

David Kosson,
David.Kosson@Vanderbilt.edu,
(615) 322-1064

fluidized gas system, and process exhaust system. Diagrams of the process flow sheet and equipment layout were presented. SBW is comprised mainly of tank waste remaining after the calcining operation stopped in 2000. This tank waste comes from a variety of sources. The expected product will be about 650 standard canisters of remote-handled transuranic waste with a surface dose of 50 R/hr. The process building includes Performance category 3 reinforced concrete process cells that would support a future processing mission for higher source term calcine. Currently, the WIPP permit prohibits receipt and disposal of treated tank waste from Idaho without a Class III permit modification. We have assumed that such a permit modification requires a waste determination to conclude the waste is transuranic and not HLW.

[Hagers presentation](#)

Desired Pu Loading During Vitrification

*Jean Ridley & Allen Gunter, Waste Disposition Programs Division
DOE-Savannah River*

For several years, the Waste Acceptance Product Specification (WAPS) listed a maximum of 2500 grams as the upper limit per canister for plutonium (all isotopes combined). The Yucca Mountain License Application specifies an upper fissile limit of only 897 gm/m³ of which plutonium is the largest contributor. This change challenges operations at the Defense Waste Processing Facility (DWPF) to maintain canister production within established limits. This change also resulted in the halting of the plan to process 5 MT of Pu through DWPF. The ultimate fate of this material is still in analysis. As the situation stands now, this fissile limit could result in producing an additional 400 to 700 canisters.

[Ridley presentation](#)

Tank Waste System Integrated Project Team

Steve Schneider, Office of Engineering and Technology

This work resulted from an action created at the 6 November 2008 Board meeting. That action ordered an optimization study of the Strategic Planning Initiative and the optimization study resulted in the conceptualization of the Integrated Project Team (IPT). Steve presented background on scale and scope of the EM task overall as an indicator of the need to integrate clean-up efforts. Starting with that, he discussed the scope of the IPT (develop strategic model, develop optimized strategy, identify transformational research and technology, and save more than \$1 billion), IPT Structure (leads, members, and subteams with specific tasks), and the key activities of the IPT (model development and integration, optimize strategy, interact with regulators and stakeholders, cost estimating, and develop IPT report). Other important concepts coming from this study are notions of transformational discoveries and optimized strategies. Transformational discoveries are those paradigm shifts that fundamentally change the way we do business to improve cost, schedule, and performance. Optimized strategies are needed because the possibility of an improvement in one process may hamper progress in another.

[Schneider presentation](#)

NEWS:

SENATE CONFIRMS TRIAY AS NEXT DOE CLEANUP CHIEF

The Senate confirmed Ines Triay as the next Assistant Energy Secretary for Environmental Management by unanimous consent late last week.... Triay has held the post of DOE cleanup chief in an acting capacity since last fall. Triay was one of a slate of DOE nominees the Senate confirmed last week, which also included:

- Daniel Poneman as Deputy Secretary;
- Kristina Johnson as Under Secretary of Energy;
- Steven Koonin as Under Secretary for Science;
- David Sandalow as Assistant Secretary for Policy and International Affairs; and
- Scott Blake Harris as General Counsel.

**Mike Nartker,
Weapons Complex Monitor, 25 May
2009**

U.S. Energy Department to Set Up Panel on Nuclear Waste

U.S. Energy Secretary Steven Chu said on [11 March 2009] the Department will establish a "blue ribbon" panel to develop a comprehensive plan this year to handle the disposal of radioactive wastes from nuclear power plants.

"I believe nuclear power is an essential part of our energy mix," Chu said at a hearing before the Senate Budget Committee. "It provides the clean base load generation of electricity."

The panel Chu plans to form would be responsible for creating a long-term U.S. nuclear strategy that would include permanent disposal of nuclear wastes. He said he hopes the panel will have a proposal available sometime this year.

With Yucca Mountain shelved, lawmakers at the hearing pressed Chu on the administration's commitment to nuclear power and questioned whether

Waste Determination and Section 3116 of the 2005 National Defense Authorization Act – Site Perspective

Virginia Dickert, Washington Savannah River Company

This presentation was paired with the one following and points out that, for sites actually managing HLW, the official definitions of waste types leave much to be desired. The first definition of HLW came from the Nuclear Waste Policy Act of 1982 and defined HLW as coming from the reprocessing of spent nuclear fuel and contained fission products in sufficient concentration. But there was more left unsaid than said. As HLW passes through a pump, there is some contamination and holdup in the pump body. Is the pump now high-level waste? And what is a sufficient concentration? This amount is left undefined by the Act. At stake was a large number of canisters, possibly as many as 140,000, depending on the definition.

Accordingly, the Department developed DOE Order 435.1, which gave risk-based criteria to determine disposal requirements. This order introduced a new waste category, Waste Incidental to Reprocessing (WIR), which requires that someone decide whether WIR is transuranic waste or low-level waste, as appropriate.

According to the National Defense Authorization Act section 3116, that someone is the Secretary of Energy in consultation with the Nuclear Regulatory Commission. Section 3116 also provides criteria to be followed and it has some important differences from DOE Order 435.1. The first section 3116 Waste Determination was signed by the Secretary on 16 January 2006. The presentation goes on to provide details of the lessons learned from these Waste Determinations.

Dickert presentation unavailable at press time

Waste Determination and Section 3116 of the 2005 National Defense Authorization Act – HQ Perspective

Marty Letourneau, DOE Office of Compliance

This presentation is the other view of NDAA section 3116, from DOE headquarters. Marty points out that, when compared to DOE Order 435.1, both provide a means to treat and manage waste incidental to reprocessing. However, the section 3116 approach (obtaining a Waste Determination) can be used only in the states of Idaho and South Carolina. Furthermore, waste determinations apply only to waste disposed of in state. Although the criteria of each path is essentially the same from a technical perspective, a key difference is that the section 3116 process includes the regulatory responsibility of the Nuclear Regulatory Commission. Marty also discussed some of the cultural differences between the two organizations. He emphasized that NRC has an important monitoring role under section 3116 and that section 3116 makes both DOE and NRC subject to judicial review. It is the policy of DOE management to comply with even the option portions of 3116.

LeTourneau presentation

Status of Art & Practice of Performance Assessment with the DOE Complex

Roger Seitz, Savannah River National Laboratory

any new nuclear plants could be licensed before a permanent waste disposal plan is established.

Chu said he did not believe scrapping the Yucca Mountain site would cause the Nuclear Regulatory Commission to delay licensing for nuclear plants because there are interim storage options available for wastes.

Separately, Chu reiterated that the United States must support the creation of technology that will mitigate the carbon emissions from coal.

"We have to develop clean coal technologies because India and China will not turn their back on coal," Chu said.

(© Reuters)

TW Corporate Board

Members:

**Mark A. Gilbertson, *Chair*
Deputy Assistant Secretary for
Engineering and Technology**

**Steven L. Krahm, *Deputy Chair
and Executive Secretary*
Director, Office of Waste
Processing**

**Frank Marcinowski, III
Deputy Assistant Secretary for
Regulatory Compliance**

**Dae Y. Chung
Deputy Assistant Secretary for
Office of Safety Management
and Operations**

**Terrel J. Spears,
Savannah River Site**

**Jan Hagers
DOE – Idaho**

**Matthew S. McCormick
Richland Operations Office**

**Sunil Patel
Chief of Operations Office**

Sen Moy

Performance Assessments (known as Safety Assessments outside the US) have a long history of successful use for waste disposal. The use of Performance Assessment approaches as a decision tool is increasing and assessments of challenging Decontamination & Decommissioning, remediation, and tank closure applications are looking more like Performance Assessments. There is general international agreement on some fundamental principles, but there remain many areas where approaches continue to evolve and improve. Internationally, Performance Assessments are viewed as being most effective when implemented in a graded and iterative approach, which evolved as a result of the inevitable tension that occurs between programmatic demands for cost-effective and timely decisions and scientific desires for in-depth understanding. Recent trends in Performance Assessment include a move towards increased use of probabilistic modeling, including hybrid (combined deterministic and probabilistic) approaches, and an emphasis on increased consistency which has resulted in establishing technical forums and communities of practice (the Department is contributing to this effort; see the presentation by John Marra below). There are a number of areas where technical advances are needed and being made. For example, challenges include improved sharing of information across the Complex, graded approaches to development of input distributions, improved sensitivity analysis, and more effective use of advanced computing. Examples of technical advances that are being made include: improved models for degradation of barriers and waste forms, representation of geochemistry, and experience in application of probabilistic approaches for a variety of problems.

[Seitz presentation](#)

Experience from the Short Course on Introduction to Nuclear Chemistry and Fuel Cycle Separations and Future Educational Opportunities

David Kosson, Vanderbilt University / CRESP

In December of 2008, the Consortium of Risk Evaluation with Stakeholder Participation (CRESP) and Vanderbilt University hosted a short course, "Introduction to Nuclear Chemistry and Fuel Cycle Separations" in conjunction with speakers from several national labs and other sources. Several of the regular participants of these HLW Corporate Board meetings attended this short course, which had over 100 attendees. This presentation brings a review of the organization, content, evaluation, and suggestions for future offerings of this course. The title described the course content. The course was well received and given an average ranking of 8 on a ten point scale. Other feedback on the course provided areas for improvement such as better targeting to the intended audience, including additional basic introductory material, having more discussion of selected topics, and changing structure to promote a greater dialogue between speaker and audience. One immediate change in the course will be reorganizing the course material so that the first day is a "Manager's Overview" and days two and three are directed at more detailed technical coverage of topics. The next course offering will be in August 2009 in Washington, D.C.

Richland Operations Office

Stacy L. Charboneau
Office of River Protection

Glyn D. Trenchard
Tank Farms Project Division

Advisors:

Neil R. Davis
Savannah River National Laboratory

Thomas M. Brouns
Pacific Northwest National Laboratories

John E. Marra
Savannah River National Laboratory

Michael J. Connolly
Idaho National Laboratory

Dana C. Christensen
Oak Ridge National Laboratory

Christopher A. Kouts
Director, Waste Management Office (OCRWM)

James C. Bresee
Office of Nuclear Energy

Paul Bredt
Pacific Northwest National Laboratories

Andrew R. Felmy
Pacific Northwest National Laboratories

Ted M. Besmann
Oak Ridge National Laboratory

Bryan C. Bower
Director, West Valley Demonstration Project

Edward C. Fox
Oak Ridge National Laboratory

[Kosson presentation](#)[Role of Liquid Waste Pretreatment Technologies in Solving the DOE Clean-up Mission](#)

Bill Wilmarth, Savannah River National Laboratory

The Department of Energy's strategy for treating radioactive liquid waste stored in tanks at its Hanford and Savannah River sites consists of first separating the waste into high activity and low activity waste fractions through a pretreatment process. The high activity fraction is then immobilized in a glass form suitable for shipment to a national repository, while the low activity waste is immobilized in a waste form suitable for disposal at the respective site. (These lines were shamelessly stolen from the report of the same name, SRNS-STI-2008-00426, Wilmarth, et al). In his presentation, Bill points out that separations is a fundamental activity within the Department and the role of separations is to expedite retrieval, processing, and closure. Indeed, separations are an important part of the Engineering and Technology Roadmap. The push to create the whitepaper was an action item from the first Board meeting (see Action Item Review and Status by Steve Krahn, below). The goal of the paper is to convey the current state of technologies and applicability to an interim pretreatment facility. The whitepaper presented four major conclusions for HLW pretreatment technology, among them that the magnitude of removal of a radionuclide may not originate from a regulatory requirement. An important focus of the presentation is that the wastes at Savannah River differ from those at Hanford and that the nature of the wastes dictates selection of pretreatment technology.

[Wilmarth presentation](#)[Performance Assessment Community of Practice](#)

John Marra, Savannah River National Laboratory

This presentation also resulted from an Action item from the very first Board meeting (see Action Item Review and Status by Steve Krahn, below). An important question from that first meeting was how to achieve greater consistency in the execution of Performance Assessments. The original thought was to form a Board sub-committee and have it prepare a guidance document for Performance Assessment practitioners. On further analysis and discussion, the sub-committee now believes that the most reasonable path forward is to establish a Performance Assessment Community of Practice (CoP) and the draft charter was updated to reflect this change in approach. The draft charter specifies for CoP the goals and rationale, objectives, methods, membership, duties, and sources of support. This presentation describes each of those topics. The draft charter currently is in review by the Board Members and Advisors. Final action on the draft charter is expected at the next Board meeting (date and location to be announced soon).

[Marra presentation](#)[Action Item Review and Status](#)

Steve Krahn, Office of Waste Processing

The TW Corporate Board had four open action items, three of which

Roger Nelson
Carlsbad Field Office

Russ Patterson
Carlsbad Field Office

Theodore E. Olds
Office of River Protection

Virginia Dickert
Washington Savannah River Company

David Kosson
Vanderbilt University / CRESP

Charles W. Powers
Vanderbilt University / CRESP

Phil McGinnis
Oak Ridge National Laboratory

Russ Dyer
Office of Civilian Radioactive Waste Management

Joseph A. Watts
Los Alamos National Laboratory

Kenneth G. Picha
Office of Safety Management and Operations

Roy Schepens
Parsons Corporation

Tom Burns
Parsons Corporation

Chris Burrows
Washington River Protection Solutions

Jeffrey C. Griffin
Savannah River National Laboratory

John T. Greeves
JTG Consulting

were closed at this meeting. The 6 November 2008 meeting in Richland, Washington initiated the need for an optimization study of the Strategic Planning Initiative. Consideration of this action led directly to the development of the Integrated Project Team concept presented at this meeting (action closed). The inaugural meeting of the Board (1 April 2008) called for a Pretreatment Technology whitepaper which was presented at this meeting by Bill Wilmarth (action closed). The inaugural Board meeting also created the action of finding a mechanism to provide improved guidance in the execution of Performance Assessments. This action has gone through some evolution since first proposed and has resulted in the proposal of establishing a Performance Assessment Community of Practice (action closed). The final Action, coming from the Richland meeting, is the distribution of the Final Report from the Slurry Transport Workshop. This report is in the final stages of review and approval and will be distributed when available.

There is one new action from this meeting to be resolved at the next Board meeting. The draft charter of the Performance Assessment Community of Practice is being circulated among the Board members and advisors for comment. The draft charter is being voted on electronically by the Board members. The result will be announced at the next Board meeting.

[Action Items presentation](#)

OTHER RECENT MEETINGS

OFFICE OF WASTE PROCESSING TECHNICAL EXCHANGE
Denver, Colorado, 19-21 May 2009

Tuesday, 19 May 2009

- Opening Session
- Waste Retrieval and Closure – 1
- Waste Form Development

Wednesday, 20 May 2009

- Pretreatment – 1
- Pretreatment – 2
- Facility Readiness & Start-up
- Waste Retrieval and Closure – 2

Wednesday Evening Poster Session

Thursday, 21 May 2009

- Regulatory Activity & Performance Assessment
- Waste Storage and Tank Farm Operational Improvements
- Pretreatment – 3
- Waste Form Development – 2
- Closing Session

The internet broadcast of this symposium is located at
http://srnl.doe.gov/owp_techex09/

And select the “Webcast on Demand” button.

The webcast will remain on line until approximately 17 June 2009.