

DRAFT

Steering Committee Videoconference

Accelerator Transmutation of Waste

May 6, 1999

Minutes

Attendance:

Location/Person/Affiliation

ANL

Jim Bresee-RW
David Hill-ANL
Eric Schweitzer-DP
Dill Shipler-PNNL
Greg Van Tuyle-LANL
Dave Wade-ANL
Carl Walter-LLNL
Mike Shay-PNNL
Dick Smith-PNNL
Chet Erhman-Consultant
Eric Schmieman-PNNL
James Willit-ANL
Michael Todosow-BNL
John Herczeg-NE
Hans Ludewig-BNL
John Ireland-LANL

Washington, DC

Leroy Stewart-RW
Steve Hanauer-RW
Jim Duguid-Duke (M&O)
Norton Haberman-NE
Dave Goodwin-SC

LANL

Ed Arthur-LANL

LBNL (Telephone)

Darlene Hoffman-LBNL-NAS

These minutes attempt to capture concepts, issues, and opinions, but are not intended to be a verbatim transcript. Please provide any additions or corrections to Dill Shipler:

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Agenda

2:00 p.m. to 3:00 p.m. CDT

2:00 p.m. Jim Bresee, Introductory Remarks

Discussion Items:

1. Jim Duguid—Performance Assessment Assumptions
2. Dick Smith—Total System Life-Cycle Cost Process
3. Jim Bresee—ATW Report to Congress Philosophy
4. Jim Bresee—Planning for Face-to-Face Steering Committee Meeting

3:00 p.m. Adjourn

The agenda and timing were followed.

Jim Bresee opened the meeting setting the purpose and scope, which were defined as listed above. Participants in the videoconference from all locations were asked to introduce themselves. The attendance list is provided above.

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1. Jim Duguid discussed the assumptions used in the preliminary performance assessment runs and those to be used in the next assessments. The list of assumptions for the next assessment is copied below.
Additional comments:
 - Same number of waste packages and 0.1 number of waste packages.
 - ATW waste in Zr cladding (should see $\times 10^{-2}$ or more reduction in dose).
 - Solubility and content of Np-237 in HLW will still control long-term concentration of Np-237 in the saturated zone.
 - Carl Walter suggested a run without the HLW, Duguid will do.New runs are expected to be available mid-next week.
2. Mike Shay introduced Dick Smith and Dick presented a set of vugraphs outlining the process being used to develop the TSLCC estimate for the ATW Overview Report to Congress. The viewgraphs are available on the ATW home page under: <http://www.pnl.gov/atw/meetings/sc05061999.html>.
Additional comments:
 - Uncertainties will be addressed using probability distribution functions (pdf) and Monte Carlo methods resulting in complementary cumulative distribution functions (ccdf).
 - Preliminary results using existing data were presented in the vugraphs.
 - The preliminary results did not include R&D or demo costs (not available), just deployment.
 - Some discussion on sources and modification of data, e.g., accelerator costs were considered too high, ALMR was low because of considerable work performed to optimize design and manufacturing processes.
3. Jim Bresee discussed the philosophy to guide the development of TWG and the Overview Reports. The guiding philosophy was discussed at the February 5, 1999 Steering Committee meeting with Dr. Moniz. We are to stress science and technology and keep the reports neutral, i.e.:
 - Balance the content—neither for nor against ATW.
 - Make factual—don't emphasize one way or the other, or be philosophical.
 - Make technical—limit to ATW, not related to nuclear energy systems.
 - Identify institutional challenges—don't make recommendation for solutions.
 - Be representative—don't bias one way or the other.
4. Jim Bresee led a discussion on when and where to hold a face-to-face meeting of Steering Committee Members or their alternatives to review, discuss, and mold the preliminary draft of the ATW Overview Report. The purpose of the meeting is to bring the Steering Committee more into a steering mode for the ATW road-mapping process and an ownership position for report development. He reiterated the responsibility of the Steering Committee Members to represent their organizations (except for the three NAS-nominated members) and to provide organizational acceptance of the final products.

Darlene Hoffman raised the concern of how Steering Committee Members are to interact with the TWGs. Some discussion followed resulting in a review of recent past and upcoming meetings of the several TWGs, thus providing more opportunity for Steering Committee Members to participate. Also, announcements of future meetings will be made to all participants as soon as possible.

The next face-to-face meeting of the Steering Committee was discussed and a decision was made to hold it on June 21-22, 1999 at a mutually convenient location. Washington, DC; Chicago; Albuquerque; and Santa Fe were mentioned as possibilities, with no decision made. The location for the meeting is being determined.

Planned ATW Meetings

- Accelerator TWG—Costs—week of 5/17/99
- LCC—5/19-21/99--PNNL
- SSIG TWG—5/25-26/99--ANL
- SWF TWG – 6/2/99--ANL
- T/B TWG—6/1/99-ANL

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May 6, 1999
Jim Duguid

Assumptions for Performance Assessment of ATW Waste

1. The performance assessment is based on the repository for the TSPA-VA base case.
2. The ATW waste is contained in the same number of waste packages as the commercial spent fuel and the DOE spent fuel.
3. The size and thermal characteristics of the ATW repository are the same as the TSPA-VA base case repository.
4. The ATW process removes 99% of the Uranium and 99.9% of the Transuranics from the repository waste.
5. The ATW process removes more than 95% of the ⁹⁹Tc and ¹²⁹I from the repository waste (assume 95% removal).
6. The ATW waste will be disposed in Zircaloy canisters that provide a barrier equivalent to the Zircaloy cladding of commercial spent fuel.
7. There is no removal of ¹⁴C.
8. The waste from the first separation process will be glass-bonded sodalite that will have leach characteristics similar to high-level waste glass.
9. The waste from treatment of spent fuel from the ATW reactor will be Zirconium alloy that will not contribute significantly to the dose from the repository.
10. There may be as much as a factor of six reduction in the number of waste packages. This will be handled through a sensitivity analysis comparing the dose from the same number of waste packages to that for a ten-fold reduction.

Note: In the first performance assessment, the short-term results showed that there was no improvement in dose when only assumptions 1 through 5 were made. This was caused by removal of the cladding from the commercial spent fuel (i.e., a barrier that contributes more than two orders of magnitude to performance). In the first assessment, ¹⁴C was assumed to be removed in one case, an assumption that is not realistic except for the about 5% loss during treatment. No removal of ¹⁴C will be assumed for the second assessment. Also, the spent fuel dissolution model was used for the analyses of the ATW repository. For the second iteration on the assessment, assumptions 6-10 will be added to the list of assumptions made. The change from the 99% removal of TRU to 99.9% removal should not make a difference because of the contribution from the HLW. The change from 99.9% removal of ⁹⁹Tc and ¹²⁹I to 95% removal should increase the dose from the ATW waste by about an order of magnitude. The Zircaloy canister should decrease the dose from ⁹⁹Tc and ¹²⁹I by more than two orders of magnitude.