

Steering Committee videoconference

Accelerator Transmutation of Waste

5 February, 1999

MINUTES

ATTENDANCE

Individual	Location
Arthur, Edward	LANL
Bishop, William	FORS
Bresee, James	FORS
Burris, Leslie	ANL
Goodwin, David	FORS
Herczeg, John	FORS
Hill, David	ANL
Hoffman, Darleane	LBNL
Knotek, Michael	FORS
Moniz, Ernest	FORS
Schmieman, Eric	FORS
Shelor, Dwight	FORS
Stewart, Leroy	FORS
Todosow, Michael	BNL
Walter, Carl	LLNL*

*telephone connection

These minutes attempt to accurately capture concepts, issues, and opinions discussed, but are not intended to be a verbatim transcript. Please report any errors to Eric Schmieman (202-646-5037 or eric.schmieman@PNL.gov).

1:00 PM EST Introductory Remarks

Dr. Knotek stated that the Department has completed about 20-25 technology roadmaps. This roadmap should capture the state-of-the-art of international efforts, should have broad technological involvement, and should be primarily a technical effort through Phase III. He does not expect a single pathway, but several parallel paths converging upon success. Issues and risks associated with each path will be identified. He stressed

that this work is being performed at the direction of Congress in the FY99 Energy and Water Appropriation Act.

Dr. Bresee encouraged each Steering Committee member to appoint an alternate and to inform Jim of the appointment. He requested that each Steering Committee member review personal contact information (attached to these minutes). Report any omissions or corrections to Eric Schmieman. Dr. Bresee stated that he estimates the Steering Committee duties to be about a one-quarter time commitment for each member for the remainder of the fiscal year.

Dwight Shelor, Director, Office of Acceptance, Transportation and Integration, Office of Civilian Radioactive Waste Management, stated that his function was to remove bureaucratic roadblocks to ensure the smooth running of the Steering Committee (phone 202-586-5564).

1:15 PM EST Remarks by Undersecretary Moniz

Dr. Moniz expressed his personal gratitude to everyone contributing to the preparation of the ATW technological roadmap. He stated that this work is being performed in response to Congressional direction (transparency attached). Dr. Moniz cautioned that this is not a promotional effort, that no FY00 funds have been budgeted for ATW, and that the Department is not committed to an ATW R&D program. However, he intends to answer Congress' questions, and he expects the roadmap to be thoroughly, rigorously, and professionally developed. Further, he stated that he was not going to simply answer Congress' questions and then walk away: the completed roadmap will be seriously evaluated by him. The completed roadmap will also be reviewed by the National Academy of Sciences and their views of institutional issues will be added for congressional consideration. Drs. Moniz, Knotek and Shelor left the meeting immediately following these remarks.

1:20 PM EST Steering Committee Responsibilities Presentation by Dr. Bresee

A preliminary agenda for the first meeting between the experts and the Steering Committee was described. All times are EST.

Tuesday, 16 Feb 99

Noon-5:00PM Aerospace Building Conference Room 900
Informal 1-on-1 meetings between experts and Steering Committee. The Aerospace building is located between Forrestal and L'Enfant Plaza (901 D Street SW).

6:00-7:30 PM Loews L'Enfant Plaza Renoir Room (2nd floor)
Reception

Wednesday, 17 Feb 99

8:30AM-4:45PM Loews L'Enfant Plaza Monet-III Room (2nd floor)
Experts make presentations to the Steering Committee. Each expert presentation is expected to last one hour, including time for questions from the Steering Committee and answers from the experts. The meeting is open to the public.

7:00-9:00PM Loews L'Enfant Plaza Renoir Room (2nd floor)
Dinner, Steering Committee and Experts. Remarks by Undersecretary Moniz.

Thursday, 18 Feb 99

8:30AM-3:45PM Loews L'Enfant Plaza Monet-III Room (2nd floor)
Experts make presentations to the Steering Committee. Each expert presentation is expected to last one hour, including time for questions from the Steering Committee and answers from the experts. The meeting is open to the public.

Friday, 19 Feb 99

8:00AM-noon Aerospace Building Conference Room 900
Steering Committee meets. Goal of this meeting is to identify technical areas most in need of additional research and identify staff (lab or federal employees) who will develop detailed research program plans.

Question, Dr. Arthur: when will we receive an agenda, other documents?

Response, Dr. Bresee: a meeting agenda will be sent to everyone next week, probably by e-mail. A separate letter will describe other activities.

Dr. Bresee distributed draft view graphs that he is preparing for his presentation to the National Academy of Sciences National Research Council next week. A copy of the view graphs is attached to these minutes.

Biosketches of experts:

- Vladimir Chitaykin is a Russian expert on lead-bismuth eutectic and its use as a reactor coolant.

- Gregory Choppin is a Florida State University professor and expert on pyroprocessing.
- Waclaw Gudowski is a member of the Swedish Royal Institute of Technology, head of their ATW program, and promotes international cooperation through the IAEA on ATW R&D programs.
- Mujid Kazimi is a professor at MIT and chaired the group that reviewed the LANL ATW flow sheet in 1998.
- George Lawrence is the LANL expert on high flux, high power accelerators.
- Takehito Mukaiyama is head of the Japanese ATW program and Director of the JAERI Center for Neutron Science.
- Gennadii Petrov is Head of the High-Energy Physics Laboratory at the St. Petersburg Institute of Nuclear Physics and member of the Russian Academy of Sciences.
- Carlo Rubbia, Italian, is a Nobel Laureate (1984, with Simon van der Meer for the discovery of the W and Z particles) and an advocate of the “energy amplifier” concept. He supports the thorium – U²³³ fuel cycle.
- Massimo Salvatores is technical head of the French ATW program. He is knowledgeable about all flow sheets.
- Greg Van Tuyle is head of the LANL ATW program.
- Charles Bowman is the President of ADNA Corporation

Question, Dr. Herczeg: Is there an April deliverable to Congress?

Response, Dr. Bresee: Yes, April 12th Lake Barrett is scheduled to testify before the Senate Appropriations Committee.

Question, Dr. Hoffman: Which Board in NRC will do the institutional review?

Response, Dr. Bresee: I do not know, but hope to find out next week.

Comment, Dr. Hoffman: NRC review period is typically longer than one month.

Response, Dr. Bresee: Kevin Crowley is aware of our schedule and has not informed me of any difficulty yet. We are all aware of the length of time you and others contributed to STATS (Committee on Separations Technology and Transmutation Systems).

Question, Dr. Arthur: These 3-month workshops appear to be where all the work will be done. How will they be staffed? Will consultants be used?

Response, Dr. Bresee: DOE will supply funding for the workshops, through PNNL. We do not expect the labs to bear the costs. Congress appropriated \$4M for this work. I expect the Steering Committee will identify 4-6 technical areas for technical specialist workshops. For example: accelerator scale-up and spallation target design; subcritical reactor operations and control; chemical reprocessing and separations; etc. The panels may use consultants.

Question, Dr. Herczeg: How will the A/E be handled?

Response, Dr. Bresee: We want the A/E to develop a cost estimate for one preconceptual flowsheet. The LANL flowsheet is probably most mature. It would most likely be fast neutron spectrum, lead-bismuth cooled, and pyroprocessing. Burns & Roe has recent and transferrable experience from their APT work. We’re not looking for a precise figure,

probably something like $\pm 40\%$. The result would probably be something similar to STATS.

Question, Dr. Goodwin: Will we, the Steering Committee, review the A/E work? The NRC work?

Response, Dr. Bresee: A/E, yes. In fact, I expect the Steering Committee will “ride herd” on the A/E. The NRC work will be identified in the final report as their work, not the Steering Committee work.

Comment, Dr. Herczeg: Previous similar A/E work took more than six months. We need to start the A/E real soon.

Response, Dr. Bresee: Concur that we need to start the A/E soon. That is one of the items we will discuss in our meeting on Friday, 19 Feb. The money for the A/E is in the PNNL budget. Between October, when this work was authorized, and now we have gone through at least four iterations in planning. The present concept evolved near the end of 1998 and was approved by the Undersecretary in December. We recognize and regret the delay in startup.

Question, Dr. Arthur: I understand the necessity for the 4-6 technical working groups to proceed in parallel, but how will integration of their work occur? For example, if one group assumes reduced or increased mass flow rates in their area, this might impact other parts of the system. Will the Steering Committee be responsible for integration?

Response, Dr. Bresee: Integration is very important, and must occur while this work is in progress. The Steering Committee will have to be cognizant of the work of all technical working groups. I was hoping that Steering Committee members that have an expertise in one technical area might want to actively participate in that technical group’s work, and this would contribute to integration. However, I want to discuss integration further with the Steering Committee on Friday, February 19, 1999.

2:00PM EST Concluding Remarks, Dr. Bresee

Please verify your e-mail, phone and fax numbers in the attachment. Let Eric know of any changes (202-646-5037 or eric.schmieman@PNL.gov). We plan to use videoconferencing for most Steering Committee meetings mainly to reduce the impact of frequent meetings on Steering Committee members’ schedules (as well as reduce costs).

ATTACHMENTS

1. Steering Committee membership & contact information.
2. Transparency of Dr. Moniz.
3. Transparencies of Dr. Bresee.

1. Congressional Guidance in the FY-99 Appropriations:
 - a. Conduct a study of accelerator transmutation of waste (ATW) technology.
 - b. Establish, in coordination with DOE Laboratories, a road map for the development of ATW technology.
 - c. Identify the technical issues that must be resolved, a proposed time schedule and program to resolve those issues, and the estimated cost of such a program.
 - d. Consider and propose collaborative efforts with other countries and other programs developing ATW technology.

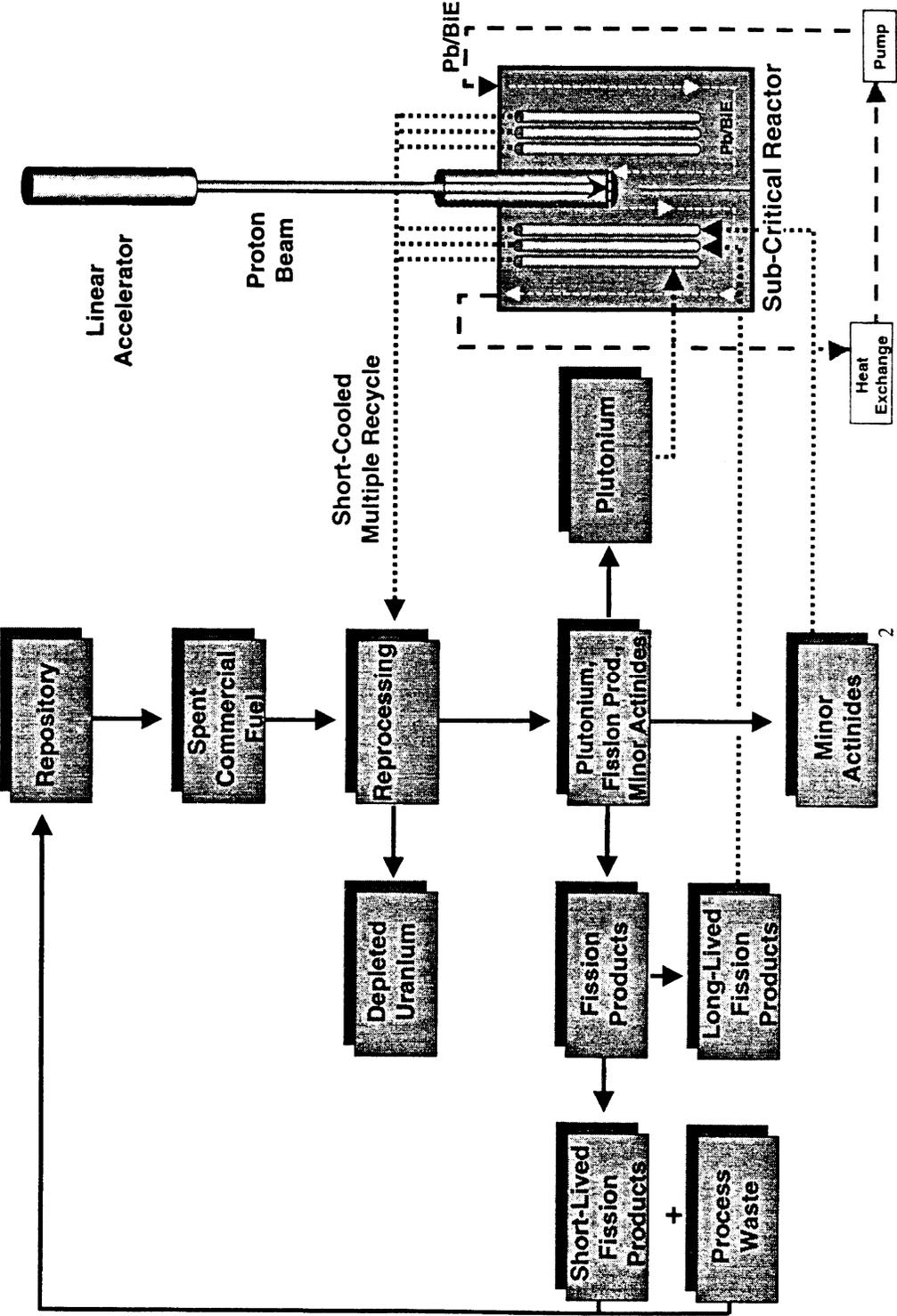
Accelerator Transmutation of Waste

Content of Congressionally Authorized Program for Fiscal Year 1999

The Department is to establish “road map” or program plan containing:

1. The identification of technical issues to be resolved for accelerator transmutation of waste (ATW).
2. The time table and program to resolve the technical issues.
3. The estimated cost of such an R&D program.
4. A plan to involve collaborative activities with other countries and with other programs developing ATW technology.
5. The identification of ATW institutional challenges.
6. An evaluation of the possible impacts of ATW on the civilian spent fuel disposal program.
7. The identification of possible benefits to other ongoing programs.
8. The estimated total capital/operating costs of treat civilian spent nuclear fuel.

Conceptual Flowchart Accelerator Transmutation of Waste



Phases of Road Mapping Program

- I. Appointment of steering committee
- II. Obtaining individual views from world experts.
 - a. Current status of ATW technology.
 - b. Critical technologic issues requiring R&D.
 - c. Opportunities for collaboration.
- III. Parallel public workshops at working level
 - a. Design of R&D programs.
 - b. Estimated cost and schedule.
- IV. Evaluation of repository impact and life cycle cost of processing civilian waste through outside contracts.
- V. Review of draft road map by NAS/NRC.
 - a. Quality evaluation of work product.
 - b. Identification of ATW institutional challenges.

Steering Committee Membership

Edward Arthur, LANL

William Bishop, DP

James Bresee, RW (Leroy Stewart, RW, Alternate)

Leslie Burris, ANL

David Goodwin, SC (Barry Parks, SC, Alternate)

John Herczeg, NE

Darleane Hoffman, LBNL

Michael Todosow, BNL

David Wade, ANL (David Hill, ANL, Alternate)

Carl Walter, LLNL

World Expert Panel

Charles Bowman, ADNA Corporation, Los Alamos, NM

Vladimir Chitaykin, IPPE, Obninsk, Russia

Gregory Choppin, Florida State U., Tallahassee, FL

Waclaw Gudowski, Royal Institute of Technology,
Stockholm, Sweden

Mujid Kazimi, MIT, Cambridge, MA

George Lawrence, LANL, Los Alamos, NM

Takehiko Mukaiyama, Jaeri, Tokai, Japan

Gennadiy Petrov, St. Petersburg Institute of Technology,
St. Petersburg, Russia

Carlo Rubbia, Cern, Geneva, Switzerland

Massimo Salvatores, CEA, Cadarache, France

Gregory Van Tuyle, LANL, Los Alamos, NM

Approximate Schedule for ATW Road Map

World Expert Meeting, February 17-18, 1999.

Steering Committee selection and staffing of parallel technical workshops, February/March 1999.

Workshop activities, March-June 1999.

Results to expert panel for individual review, June 1999.

Public meeting of experts and steering committee for individual evaluations and recommendations, July 1999.

Steering committee prepares draft road map, August 1999.

Proposed NRC review, August/September 1999.

Delivery to Congress, October 1999.