

# Steering Committee

## Accelerator Transmutation of Waste

February 19, 1999

### MINUTES

#### ATTENDANCE

Name	Organization
Arthur Edward	LANL
Bishop Bill	DOE
Bresee Jim	DOE
Burris Les	ANL
Chitaykin Vladimir	IPPE, Russia
Goodwin Dave	DOE
Gudowski Waclaw	RIT, Stockholm
Haberman Norton	DOE
Herczeg John	DOE
Hill Dave	ANL
Hill Julian	PNNL
Hoffman Darleane	LBNL
Ireland John	LANL
Karell Eric	ANL
Michaels Gordon	ORNL
Miles Todd	PNNL
Schmieman Eric	PNNL
Schweitzer Eric	DOE
Shay Mike	PNNL
Stewart Leroy	DOE
Todosow Michael	BNL
Van Tuyle Greg	LANL
Venneri Francesco	LANL
Walter Carl	LLNL
Williamson Mark	LANL
Wood Tom	PNNL
Wymer Ray	Consultant

These minutes attempt to accurately capture concepts, issues, and opinions discussed, but are not intended to be a verbatim transcript. Please report any errors Julian Hill (202) 646-7796 or [julian.hill@pnl.gov](mailto:julian.hill@pnl.gov).

## **Opening Remarks**

Jim Bresee opened the meeting at 8:30, expressed appreciation for everyone attending, and requested that everyone introduce himself or herself.

## **Discussion of Steering Committee Charter**

Jim Bresee opened discussion on the draft charter for the Steering Committee. There were only minor comments on the charter and the committee accepted it. The final charter, with committee comments incorporated, is attached to these minutes.

## **Discussion of Focus for ATW Technology Roadmapping**

Carl Walter suggested that this effort needs to take a broader focus to ensure that ATW is the appropriate path. Jim Bresee responded that the direction for this effort is embodied in the text of the legislation (HR 105-749). Verbal direction from congressional staffers responsible for this legislation was very clear. It is to focus on accelerator transmutation, not reactor transmutation.

Norton Haberman asked if the roadmap project would investigate critical systems as well as subcritical systems. Ray Wymer expressed that both the nature of the instructions of the bill and the time allowed to complete the project necessarily limits the scope of the project to that defined by the bill. Darlene Hoffman agreed and added that the STATS panel took six years and that we must narrow the scope to complete this effort on time. John Ireland then asked if a comparison between reactor and accelerator systems would be made. Jim Bresee replied that a thorough analysis would be too challenging, but he believed there are some aspects of the comparison that may need to be made.

Carl Walter stated that the present nomenclature (ATW) presumes that spent fuel is waste and that a change in terminology might be appropriate. Jim Bresee explained that today, by definition, it is considered a waste although he would like to see, early in this project, a clear statement of the fuel value remaining in the waste. Waclaw Gudowski suggested that the US should learn from the lessons of Europe. Waste is an issue now and it should be treated as the first issue. Most individuals engaged in solving the problem of waste do so from a reactor standpoint. He suggested that the ATW Roadmapping effort take advantage from the international analyses of accelerators vs. reactors and not redo them. Bill Bishop then explained that there was a clear directive to provide a roadmap for ATW, not reactor transmutation. The Under Secretary is expecting to see a roadmap for ATW. Jim Bresee stated that Mike Knotek will be representing the Under Secretary on the ATW roadmap project. He would be briefed on both this meeting and the world expert meetings of the two previous days. The consensus of the steering committee was to keep the focus narrowed on accelerators.

## **Identification of ATW Technical Working Group**

Jim Bresee then asked for feedback or other ideas on the strawman technical working group (TWG) structure that was delivered the day before. There was some initial confusion on exactly what the System Scenarios and Integration (SSI) TWG would do. Jim Bresee explained that integration is a very challenging task facing the project. It will be difficult to maintain communication and interface matching between the working groups. The SSI TWG would maintain communication between working groups and provide some accountability to keep the other groups on track and at task. The SSI TWG would also provide technical direction for the two parallel outside contract activities, the cost estimate and the performance assessment. Gordon Michaels suggested that the SSI TWG could analyze the potential impact of ATW on the Yucca Mountain repository.

Ray Wymer stated that a decision would need to be made on whether we are addressing ATW as reducing problems at Yucca Mountain, or are we conducting a more general analysis like the French R&D program. He suggested that specific goals be set in order to provide that integration. He proposed an integration method that states specifically which actinides and fission products are going to be addressed by the TWGs, and what levels of reduction should be achieved. These goals affect all other design

parameters. Ray Wymer suggested a target of all actinides and fission products with half-lives greater than 3,000 years. Len Burris agreed. These kinds of targets are necessary for the separations and chemical processing function. John Ireland also agreed.

Jim Bresee expressed concern that this would give the idea that the TWGs must work sequentially. The TWGs need to work in parallel. Greg Van Tuyle suggested that narrowing the focus might be the most practical way to achieve this. The SSI TWG should not restrain itself to only one system. It should have the freedom to look at other scenarios at a high-level but does not have to work out all of the detail. International collaboration will come into play as other scenarios are looked at. Bill Bishop questioned whether this was a Steering Committee (SC) function rather than a TWG function.

Jim Bresee explained that there should be some representation of the SC at the TWG meetings. They would have the responsibility of critiquing, making recommendations, bringing focus to problems as they arise, and passing information back and forth to the SC. Specific targets would need to be designated as early as possible to ensure unity.

After some discussion, it was decided that the Chemical Separations TWG be called the Separations Technology and Waste Forms (STWF) TWG.

Michael Todosow recommended that high-level baseline requirements be set. The TWGs could sort through the individual issues associated with its task. Jim Bresee stated that between the SC and the SSI TWG, an agreement could be reached on what the parameters are. Gordon Michaels stated that there are two primary issues that need to be addressed. First, regardless of the technology, how well do we have to do? [e.g. Burn-up of actinide, decontamination factors for separations system, etc.] Second, from a technology standpoint, how well can we do? Gordon Michaels also suggested we need to specify whether the ATW system will be an energy provider. Dave Hill stated that it is only practical for the SSI TWG to set the agenda. Therefore the SSI TWG should have SC members on it. Mark Williamson recommended that the LANL flowsheet used for the MIT review be used as a baseline.

Jim Bresee suggested that the LANL Flowsheet used for the MIT review would be used for something akin to a mission statement. All working groups can begin work based on that document. He foresaw that it would be modified and matured by all the working groups. John Herczeg pointed out that the bill charter gives specific goals, which should be used for guidance.

It was decided that the LANL flowsheet used in the MIT review will be used as the baseline for this effort. The SSI TWG will use that to coordinate changes to all the other working groups. Jim Bresee then asked if there was general agreement that a SSI TWG group is a good idea. John Ireland stated that the SSI TWG would establish the baseline system but the Target/Blanket TWG would handle specific alternatives of coolants and reactor design. The other TWGs could make investigations and then make recommendations back to the SSI TWG. The details would be left to the other technical TWGs.

It was asked where the recommendations of the expert panel for R&D get addressed. Ray Wymer stated that each TWG should address these. Greg Van Tuyle cautioned that experts around the world are converging on basic characteristics of an ATW system and that the TWGs should not go too far astray from the international consensus.

It was agreed that there should be an Accelerator Technology (AT) TWG and there was consensus to have a STWF TWG.

There was a lengthy discussion about the organization of the Target/Blanket TWG. Ray Wymer suggested a separate neutronics group but it was argued that this is part of the reactor design. Greg Van Tuyle suggested that coolants be combined with the Materials Group. Fuels should be included in the Materials Groups as well. It was asked whether the Target/Blanket Group could be divided. Francesco Venneri stated that it would be wise to make subgroups within this working group.

Vladimir Chitayakin stated that this situation is similar to what the former Soviet Union went through. When they first developed the reactors, they skipped over the issues of materials and concentrated on reactor design. This resulted in the 1968 submarine accident he described on Wednesday. Later, they overdid the materials side. The materials people then dictated to the reactor designers how the reactor would look. As a result they arrived at a design that was poor for maintenance and operation. This indicates that they must be considered together. It is important to know the perspective of the unifying entity. If the focus is on reactors the result could be disastrous. The opposite is also true. The Russians have only the high level designs of the LANL concept. They are trying to include in the design their experience. His suggestion is that the LANL concept be the first topic of the first TWG meetings.

It was decided that there would be a Target/Blanket Technology (TBT) TWG with a large charter capable of organizing appropriately into two or more subgroups.

John Herczeg asked who would oversee the costing of the systems. Jim Bresee explained that the SSI TWG would have oversight of the A&E work. The SSI TWG would be responsible for integrating the R&D cost estimates into the product. It was asked who is responsible for the cost of each functioning TWG. Jim Bresee explained that the cost is the responsibility of the administrative managers (PNNL). Darleane Hoffman asked whether institutional issues were going to be considered separately. Jim Bresee explained that they would be addressed in the final report to carry out the congressional mandate. The institutional issues will be summarized in an appendix written by the NAS. The TWGs will naturally bring up institutional issues, so they will appear in the final report in multiple places.

#### **Identification of Technical Working Group Leads**

The task of staffing the TWGs was then addressed. It was decided that TWG leaders would be responsible for staffing their own groups. SC members should not to be leaders of the TWGs but alternates could be. However, SC members should be active and involved in the TWGs.

Recommendations were taken for TWG leaders. It was decided that the TWGs would be led as follows:

System Scenarios and Integration:	Dave Hill
Accelerator Technology:	George Lawrence
Target/Blanket Technology(co-chairs):	Doug Crawford Francesco Venneri
Separations Technology and Waste Form	Jim Laidler

A question was asked on funding the TWGs. It was decided that each TWG should submit a budget. Each TWG may have approximately 10 or fewer people. For the next six months, each individual would work approximately quarter time. This figures out to be approximately a couple of man-years of effort for each TWG. Therefore, as a rough estimate, each individual TWG should cost several hundred thousand dollars. It was recommended that work should be done by video conferencing and email as much as possible.

Estimates of TWG budgets would be due by March 1, 1999.

## **Steering Committee Interests in Technical Working Groups**

SC members were polled regarding their interest in individual TWGs.

Edward Arthur	SSI
Bill Bishop	SSI, STWF
Jim Bresee	STWF
Les Burris	STWF
Dave Goodwin	AT, SSI
John Herczeg	SSI
Darleane Hoffman	STWF, TBT
Carl Walter	TBT, SSI

It was asked how the other laboratories get involved. Jim Bresee responded that he wants broad involvement of all the labs & M&Os. Interested labs should contact the TWGs.

It was asked how foreign participants get involved. Jim Bresee stated that foreign help from individuals as advisors is most welcome. They cannot be part of any TWG consensus. FEDS or M&Os must provide any consensus recommendations. The meetings will always be open and minutes/drafts will be available on the ATW website.

A request for email addresses and phone numbers was made, to be provided to the PNNL secretariat

## **Adjournment**

# Steering Committee Charter

## MEMBERSHIP

Arthur, Edward
Bishop, William
Bresee, James
Burris, Leslie
Goodwin, David
Herczeg, John
Hoffman, Darleane
Todosow, Michael
Wade, David
Walter, Carl

## RESPONSIBILITIES

The Steering Committee responsibilities are to:

- Direct the road mapping effort
- Receive information from world experts
  - Current status of the technology
  - Recommended R&D
  - Opportunities for collaboration
- Identify and help organize Technical Working Groups
  - Identify technical areas needing R&D
  - Identify and coordinate interfaces between Technical Working Groups
  - Identify a lead individual for each Technical Working Group
  - Identify Steering Committee liaison for each TWG
- Provide technical parameters for
  - A/E cost estimates
  - Repository PA improvements
- Prepare the draft report for the Undersecretary

## DELIVERABLES

- Meeting minutes
- Technical Working Groups' Charters
- A/E scope statement
- PA parameters document
- Draft report for Undersecretary review

## LIMITS AND EXCLUSIONS

- Not responsible for institutional issues (NAS)

## SUPPORT REQUIRED

- Technical Working Groups – R&D planning
- A/E – life cycle cost estimating
- YMSCO – repository PA improvement estimate
- PNNL – integration, logistics