

FINAL MEETING SUMMARY

**HANFORD ADVISORY BOARD
TANK WASTE COMMITTEE**

May 11, 2011

Richland, WA

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This is only a summary of issues and actions in this meeting. It may not represent the fullness of ideas discussed or opinions given, and should not be used as a substitute for actual public involvement or public comment on any particular topic unless specifically identified as such.

Welcome and Introductions

Larry Lockrem, Tank Waste Committee (TWC) Vice-Chair, said everyone in the room is aware that budgets are becoming tighter within the United States Department of Energy (DOE) and other government agencies as well as in the commercial industry. Larry said the Hanford Advisory Board (Board or HAB) is determining mechanisms to become more cost effective while still supporting their environmental mission. He said today TWC would be experimenting with telecommunications via computers and the phone to possibly help reduce travel costs for in-person meetings. Larry said Dirk Dunning, TWC Chair, will be leading the committee meeting over the phone.

Dirk said he would first like to mention the Executive Issues Committee (EIC) retreat. He said the EIC recently held its Leadership Retreat where they meet with agency representatives to talk

about the key issues and develop a work plan for the coming year to address them. He said Nick Ceto in particular and DOE were concerned about the budget and asked the Board to pursue using technologies that would allow more remote and online meetings. He said he listened to part of the River and Plateau Committee (RAP) meeting yesterday and there are sound quality issues that would not allow for a full online meeting at this point. He was unable to hear many people around the perimeter of the room. Dirk asked that individuals not at the main table either speak closer to the table or have someone near the phone relay what is being said.

Dirk also commented that he needs to re-examine the February summary since edits were suggested and suggested the committee adopt it at its next meeting. The committee approved the March meeting summary.

Alternative Waste Forms

Dirk said Shirley Olinger spoke from a DOE-Headquarters (DOE-HQ) perspective on long-term costs and schedule for the Waste Treatment Plant (WTP). He said the focus was on fluidized bed steam reforming (FBSF) and agencies spoke with the Board about other alternative technologies. Dirk requested that DOE come speak with the Board about what they are working on.

Larry said there was a technology roadmap completed during a workshop last summer. Pacific Northwest National Laboratory is revising the report and he does not think a second revision is available yet. He said once the revision is available, the committee will probably need to readdress alternative waste forms and the roadmap. Larry volunteered to be an issue manager (IM) with support from Rob Davis.

Larry introduced Steve Pfaff, Federal Project Director for supplemental and secondary waste treatment, DOE-Office of River Protection (DOE-ORP), who would provide a presentation on alternative technologies to vitrification with a focus on the current level of technology development for FBSF, cast stone, and bulk vitrification that are currently under consideration.

Steve said he would discuss alternative waste forms in the context of supplemental immobilization management processes. He said in the DOE project management sequence a score of zero indicates a critical decision is needed. Steve said DOE received authorization in December or January to build a facility to complete work. DOE is entering Critical Decision 1, which involves conducting alternative analysis and selecting a design. Secondary waste treatment is also undergoing preliminary alternative analysis. Steve said he would discuss the readiness level of these different waste forms using the DOE guide on technology readiness

levels (TRLs), which is adapted from the National Aeronautics and Space Administration (NASA) and the Department of Defense (DOD).

Steve said the TRL for second low activity waste (LAW) vitrification is six, bulk vitrification is five, FBSF is four, and cast stone is four. A TRL of four indicates that the system has been validated in a lab environment with the possibility of some larger scale pieces of equipment, but not in a prototypical form. Steve said DOE is currently testing Hanford Site waste in a bench scale steam reformer at Savannah River (SR). The Idaho Site is building a steam reformer for a different type of waste, which should be able to be adapted to handle the type of mineral waste at the Hanford Site.

Steve said DOE is also working to determine how closely the simulants used in the SR bench scale experiments correspond to actual waste from the Hanford Sites. He said if they scale-up the experiments, DOE will use simulants instead of actual waste so it is important to have a thorough understanding of how the two compare.

Steve said case stone is still being considered, but as a fairly simple type of grout aversion. Cast stone was rejected around 2002 or 2003 and the technology was spread around the DOE complex. DOE has been testing grout forms for a long time and it has a TRL of four. Steve said DOE is testing several advanced methods for immobilizing liquid and slurry waste.

Steve said bulk vitrification has a TRL of five, meaning there have been lab experiments and a similar system has been validated in a relevant environment. Bulk vitrification has been tested using actual Hanford Site waste in a full-scale, almost prototypical system. Steve said one major concern was how well the uranium would remain in the waste box and he is not sure that problem has been solved. He said the bulk vitrification option is being considered because DOE has the most information about it and because it is included in Tri-Party Agreement (TPA) requirements.

Steve said second LAW has a TRL level of six. DOE is testing the technology on different scale melters. He said there is a great deal of information on melters in the United States and abroad that justify the TRL level. He said DOE is continuing to test melter technology to determine how to optimize performance.

Steve added that DOE will convene an expert review panel to look at all data packages and make a final decision.

Regulator Perspective

- Suzanne Dahl, Washington State Department of Ecology (Ecology), asked if these efforts were separate from the Environmental Impact Statement (EIS) work. Steve said they are.

Suzanne said she was surprised DOE was re-examining all these technologies. She said the purpose of the EIS is to end discussions on all other alternatives. Suzanne did not realize DOE was returning to the project level and making down-select decisions again. She said Ecology did participate in the 2003 down select committee, but were purposely not involved now because Ecology believes the TPA and consent decree were clear on vitrification. Suzanne said she was confused on who was making decision since it has already been made in the milestones and negotiations.

- Steve said since the project management system takes several years to complete, DOE must make progress in examining alternate options. He said the work does not supersede or overcome the process stipulated by the TPA and negotiated down-select decisions. Steve said DOE is evaluating these different processes again, but are not in front of the EIS. Steve said the dates for the milestones are hopefully beyond what will be in the EIS and Record of Decision (ROD). The TPA mandate requires consideration of a second LAW facility regardless of analysis results.
- Suzanne said Ecology believes the milestones that allow for consideration of treatment alternatives other than vitrification ended in 2006. The milestones stated that if no alternate options were decided on by 2006, the decision would be for second LAW. After 2006 there was a series of negotiations resulting in language that clearly specifies vitrification is the technology for consideration. Suzanne said there were very specific discussions about language. She realizes the EIS must look at all the alternatives, but still has concerns that other technology options are still being considered in the EIS.
- Suzanne said the situation is frustrating because the discussion should have ended in 2006 when the milestone was set at the default decision of second LAW. She said Ecology will consider the data created, but their stand has always been that whatever kind of treatment is chosen must be as good as the original low-activity glass described in the 2001 Performance Assessment. She added that it is useful to examine various types of immobilization technology since a lot of waste at the Hanford Site needs to be immobilized.

Committee Discussion

- Larry asked if the classification of various technologies was completed four years ago. Steve said he was not sure. Suzanne said the classification was recent. Larry said he was involved three or four years ago and was asked to participate again when they were closing out the technology. Exact numbers were given at that time. Larry said there has been a lot of progress on technology and TWC has not had the opportunity to hear about the new data for some of these technologies. Larry said TWC would benefit from hearing

about technology developments since the decision was made for vitrification years ago. He said TWC could evaluate if the technologies offer a means of solving some of the problems.

- Vince Panesko asked Steve what drivers would cause them to consider options other than glass. He asked about the performance of melters at SR. Steve said SR has replaced the melters once. He said that until recently the throughput was lower than what would be expected at the Hanford Site, but after adopting bubbling technology the throughput has increased substantially.
- Vince asked if the melters had issues with metals in the bottom. Suzanne said she does not think the melter failed. SR took it out of service. Pam Larsen said the melter was scheduled to last five years, but it was kept in use for significantly longer. Suzanne added that the melter ran at significantly less than capacity initially and she is unsure if it ever reached the 70% operating efficiency expected at the Hanford Site.
- Vince asked if off-gas was a concern and whether any issues with off-gases had been resolved. Steve said he does not have a lot of information on the SR melters. He said the volume of waste and the timeline are what drive DOE to consider other technologies, although the technology comparison may not reveal anything cheaper than glass.
- Steve said TWC would hear a presentation later on System Plan 6 that would focus on some of these technologies, at least for FBSR and second LAW. He said they would consider estimates on construction cost and second LAW has the highest capital cost. Steve said FBSR is cheaper to build and operate with less off-gas.
- Suzanne said that is one version, but the cost reporting stated all options are fundamentally equal. Steve clarified that FBSR was not evaluated. Suzanne said FBSR was addressed in some paragraphs near the end of the document. She said the cost of FBSR ties into the size of the facility. It is concrete and rebar with many of the same construction needs as second LAW as they are both facilities handling the same amount of waste with nuclear safety controls. Dick Smith said historically new systems look cheap and easy. He said bulk vitrification was originally estimated at \$25 million to become operational. They have already spent that much on the facility and it was never operational before being abandoned. He said the less you know about something, the cheaper and better it is.
- Al Boldt said the input for second LAW has a basis for cost from the first plant. The numbers DOE used for FBSR were based on numbers from the Idaho plant. Al believes that the cost will be more than the contractors are willing to say. He said there is a smaller plant in Idaho that is scheduled to begin operation during the current year.

- Suzanne said issues like operability must be considered when operating a plant. There are many managed controls that can be dialed up or down on a regular basis, which causes challenges for operation. The mineral formulation must be constantly adjusted.
- Al returned to the question of the FBSR off-gas system. He said FBSR is less expensive and less complex because material is blown up the stack. Al said Ecology would first need to approve the off-gas treatment and accept the cost system being proposed before the Board could make a statement. Steve agreed. He said DOE had discussions on different permitting options for new systems versus systems that have been operating for years.
- Maynard Plahuta asked what the scale of TRL numbers was. Steve said the scale is from one to nine. Level one corresponds to a technology that has been observed and reported in a lab environment. Level nine corresponds to an actual system operating over a full range of conditions, such as the melter at SR that has been operating for years. Steve said there is a reference in DOE Guide 413.3-4. He will provide that information to Cathy McCague, EnviroIssues. Steve said for the project management process they can only proceed with technologies at a TRL of three or higher.
- Suzanne asked why cast stone and FBSR were not examined in the costing report. She said the paragraphs addressing these technologies stated there was not time to prove out alternative technologies and alternative waste forms. She said all elements must be considered when developing a system and proving it works using full-scale testing from funding, design, permitting, and construction. This process can take at least five years and then the project must be funded which can be another three to seven year process. She said design takes at least three years, which is an underestimate. Permitting can take two years. Construction requires five years. Suzanne said that for a facility to come online by 2022, which is required in the milestone, any work would have to have begun in 2002. If a new alternative technology is chosen and efforts begin now, that technology will not be operational until after 2030. Suzanne said 2022 is only 11 years away. She asked the committee to consider all the issues with the LAW facility and the WTP. Suzanne said it is not the time to reconsider alternate options.
- Vince said he thought a new technology insertion point had already passed in 2006. Steve said he was not considering TPA milestones in his job at that point. He said while Suzanne expressed the view that vitrification is locked in as the only technology option, DOE does not agree with that. He said second LAW is covered in the milestones and that must be included. If DOE does decide on a technology other than second LAW, they must produce a report by 2014. Steve said whatever technology is decided on must be negotiated with Ecology. No agency can make the decision on their own.

- Maynard asked if there is the potential for a facility to replace second LAW based on what Suzanne said. He said it is unclear how long second LAW will be operational. Maynard said it would be unfortunate to stop investigating now and discover at some point in the future that decision was a mistake. Steve said given the extensive cost of these facilities, if DOE does receive authorization for Second LAW, they will design the facility to have an extensive lifetime for the size of the mission. He said some of the alternative technologies could be applied to other uses. Suzanne said she could see Maynard's point and acknowledged that alternate technologies could be used in smaller mobile applications such as supplemental waste.
- Larry said during the down-selection process, DOE established criteria for selection. Technetium became a big issue that had not been in the initial selection criteria. When DOE considered the leach rate of each technology there was more information available for bulk vitrification. Consequently, bulk vitrification was seen from an optimization standpoint as being more ready than the other two technologies under consideration.
- Larry asked about iron-phosphate. He said Shirley had previously talked about DOE-Office of Environmental Management using additional types of technology funding from different budgets. Shirley mentioned iron-phosphate would potentially move forward, but Larry said he now heard those efforts were ending again. Steve said he cannot speak specifically about that. He said DOE did not receive as much technology development money as they wanted because of congressional budget issues.
- Steve said if they ultimately choose a second LAW facility as supplemental immobilization they would need to decide on what to use for melters. He said that decision would not need to be made at the down-select point; it can be decided as the rest of the facility is designed. Steve did acknowledge the facility is substantially larger and that there would be much more sodium to process since the aluminum removal facility is no longer being considered.
- Al said another facility would need to be built if they are not able to pre-treat enough material. Steve said there is a report being issued on that topic with an interesting discussion on changes to the pretreatment facility.
- Liz asked about the TRL scale. She said she was unclear about if chosen technologies move off the scale and where vitrification fits into the scale. Liz asked if second LAW is at the same level as the existing LAW. Suzanne said first LAW and second LAW are on the same level. Steve said he would guess all these facilities have a TRL of six since they are all under construction. That number would increase as the facilities are tested and move into the final operational stages. Steve said that in order to conduct an alternative

analysis, the TRL level must be at least three in order to ensure that there is some basis to assume it might be a viable option.

- Pam said one of the fundamental concerns of the Board and TWC is the tight budget situation. She is concerned with the amount of money spent on bulk vitrification when it was clear early in the process that the technology would not work. She said constantly changing approaches impacts the budget. Pam said she believes both the Board and the agencies would like money to be well-spent.
- Dirk thanked Steve and Suzanne for speaking with TWC. He said the project management and technical system takes a long time to navigate. There are five standard phases of project management, which always begin with wild enthusiasm until problems with the project start to be uncovered. The known elements are limited, while the unknowns are very large. Dirk said there is a tendency to focus on what is known and ignore what is unknown. He said this can lead to unfair comparisons between alternatives. Dirk added that costs estimates can more than triple as these unknowns are discovered. The Board saw this with bulk vitrification where there is potential in some areas, but also some major drawbacks. Dirk said there should be exit points that help determine whether the technology will be viable or if the cost will be so high that the technology will not be competitive. He said there are a set of good guidelines for moving forward with the vitrification plant and second LAW, such as requiring a TRL of three to even begin considering an alternative. Dirk said it might be preferable to consider technologies that have reached at TRL of six, but to not compare those technologies until they are all at a level of seven. He said the Board should offer advice on this issue in the coming months.
- Steve said it would be nice to be able to reach a TRL of six or seven before making a decision, but that is often not how the process works. He said DOE cannot spend money to advance every technology to level six or seven. The maturation process is done through design.
- Dirk said it is more important for decision-makers to have a very clear understanding of the process and potential vulnerabilities. He said decision-makers can support something long after it ought to have stopped because they do not understand the process.
- Dick said previous studies have shown iron-phosphate would reduce the amount of glass needed by a significant fraction to where second LAW might not be necessary. Dick said from his perspective funding for iron-phosphate was cut off because DOE decided they did not need the answers. He has heard that now DOE will write reports. Dick said conducting a series of experiments and not allowing the results to be published is a not a

wise approach to research. He said his point is that the iron-phosphate example illustrates an approach that DOE-ORP resisted for years.

Enhanced Tank Waste Strategy

Dirk introduced the next agenda topic: Enhanced Tank Waste Strategy (ETWS). He said Steve would give a presentation with an update on progress since the February TWC meeting.

Steve said ETWS is more than the pursuit of FBSR. The goal is to complete the mission seven years ahead of schedule and save \$16 billion. He said DOE is asking what it will take to achieve this and is examining a variety of scenarios under ETWS.

Steve said in pretreatment, waste is taken from tank farms and areas of concentrated solids to high-level waste (HLW). Liquids are taken to low-level waste and can also move to supplemental treatment. All of this waste moves to secondary treatment. Steve said he believes DOE has competing initiatives to some extent involving how to create a sustainable immobilization process when there is not enough space in the double-shell tanks (DSTs) available to complete the retrieval in the desired timeframe.

Steve said single-shell tanks (SSTs) are for staging waste. DOE is working to retrieve waste from the SSTs that are leaking. Wastes have been accumulated together to make the throughput easier for supplemental treatment. Steve said DOE requires approximately one year to prepare each tank for retrieval and then another two to four years to physically retrieve the bulk of the contents. He said it would be easier to retrieve waste from one tank that is mostly filled than to retrieve waste from 15 partially filled tanks. He said it is important to optimize throughput for high activity waste and build enough LAW capital. Steve said optimizing the throughput can substantially decrease time retrieving wastes and increase waste loading into glass.

Steve said if DOE is going to build an immobilization plant for supplemental treatment, DOE could have immobilization technologies in both the 200 East and 200 West areas. There would need to be a way to feed the waste into these areas. He said there is a separate analysis going on. DOE has not selected an alternative; they have just narrowed them down. One option is pretreatment in the tanks. Micro filters that spin would be installed and the waste would spin through this column. Solids remain outside the rotating disk while liquids seep through and the filtered solution is removed. Another option is to use a riser with an ion exchange column.

Steve said SR has been pursuing the use of rotary micro filters with ion exchange columns. He said DOE-ORP would like to use as much of the SR design as possible to save money. The decision to put filters within the tanks or in a box on top of the tanks depends on capacity. He

said a smaller feed stream would be needed to meet the 2020 vision with the early startup of LAW. Steve said DOE ultimately needs to decide where to put the technology development and program management dollars. He said the decisions are not in direct opposition, but will require different decisions in how to spend the dollars. DOE and Ecology are debating the issue because milestones require a facility large enough to pre-treat waste and meet the deadlines. Steve said another facility is required to accelerate the mission, which would require significant dollars and significant timeframes for construction permitting. It is useful to begin pretreatment early to accomplish a LAW waste feed by 2016.

Regulator Update

- Suzanne said she questions an interim pretreatment system of some kind if there needs to be a certain capacity. The capacity of first LAW plus second LAW must both be at capacity for the HLW to operate at full capacity. She said waste from the tank farms must be brought to the facility. The burden will be to handle effluent from treatment of the waste. If HLW does not have the room and capacity to treat, waste will need to be returned to the tanks, which is not acceptable. Suzanne said the target date for building an interim pretreatment system to enable early startup of LAW would be 2016. She added that this estimate is for a smaller version. She said Steve is describing a larger interim pretreatment system to supercharge more waste into supplemental treatment that would move the mission along faster. Suzanne said the question is why DOE believes a bigger facility is necessary. Ecology does not think the pretreatment facility is undersized because DOE continues to assure Ecology that the pretreatment facility is an adequate size. She suggested DOE consider smaller interim pretreatment facilities.
- Suzanne said another competing need is if DOE is staging waste to feed the larger interim pretreatment system that will be sending waste to supplemental pretreatment rather than taking up space in the DST. There is a finite amount of space that limits how much can be done at the same time. Suzanne said the System Plan helps to evaluate these questions. Ecology and DOE both offered some alternatives to consider. Suzanne said seven years of work could be saved by pre-banking the sludge, which will not be possible without building more DSTs.
- Suzanne said that the money projected to be saved runs through 2047. These types of statements are very popular with people at DOE-HQ because it makes DOE look good. She said the same issue exists with privatization where money is saved, but the initiative can fall off the plate.
- Suzanne said if new initiatives delay the current approach, the amount of money to be spent actually increases and the environmental impact is greater from leaving waste in the

tanks over a longer timeframe. She said at some point the waste will not be retrievable or will be much more costly to retrieve from corroded tanks.

Committee Discussion

- Pam said there are many political drivers behind these decisions. She said the smaller interim pretreatment approach will hopefully allow treatment at LAW sooner than 2016. She said it would be good to commission some of the facilities earlier rather than later. She is still not convinced of the need for larger interim pretreatment. Funding will be dealt with in the future if pretreatment is determined to be undersized in the future. Pam said there are activities not currently being funded; such as secondary waste, placement for high level glass, and building the second LAW facility. The capitol projects that need funding to meet milestones in 2019 and 2047 will have to be addressed. She does agree that smaller pretreatment is necessary for early LAW.
- Dirk asked the agencies what areas would benefit the most if the Board developed advice. Steve said there are elements of different strategies that do not work well together. The Board could provide input at the policy level on what is most important. There are long-range strategy decisions on how to treat LAW faster that the Board could provide input on.
- Larry said two years ago SR was conducting quite a bit of work with rotary micro filters on simulants. That work ceased when they were in the process of determining whether to move forward. SR asked Hanford to send waste that could be tested, but there were issues. Larry said a report was published and DOE presented information to the Board approximately a year and a half ago. He said because of the outcomes of those tests, Hanford is moving forward with the technology, but Larry has not seen any outcomes from those tests. Steve said the filtration choices are either a spinning disk or a column. Tests have been done on a small-scale with real waste and a large-scale with stimulants. He said the technology does look promising enough that SR has chosen to use it and build on it. The other filter choice is cross-flow filters, which are being installed in WTP. Larry requested more information on cross-flow filters.
- Pam said that some technologies are receiving money that do not have much promise for success. She suggested the Board provide advice to follow-through on micro filters and ion exchanges if it would allow for early LAW. She said they are all concerned about the ultimate time when WTP will be operational. Sustained funding from Congress is necessary to demonstrate that this is a successful project.
- Al said the discussions are focused on supplemental treatment and supplemental pretreatment, but he has not heard anyone mention other technologies for HLW. He said

there is technology for a high temperature glass melter with the potential for creating crystals in the glass. Al said the combined technologies could be almost as good as iron-phosphate glass. The ETWS should consider these HLW melters and glass formulations, which might eliminate the need for building other facilities and decrease the timeline by seven years. Al said the Board should think about building less rather than building more. Steve said the only way to increase the timeline is to increase the throughput.

- Dick said he wanted to discuss reusing some of the intact SSTs. He asked if the process is to move damp solids from an existing tank into another old tank. Steve said the process depends on what waste they are starting with. There are some tanks that do not have a lot of waste so it would be conceivable to combine waste from several tanks into one. Steve said the requirements for interim safe treatment are minimum liquids with minimal leak potential and a place where the waste can be moved quickly if a leak develops. He said this is not easy, but that would be how DOE might approach the process if they were to ultimately determine reusing SSTs would benefit the retrieval workload. Dick said he is considering the overall programmatic cost. He asked what the cost would be to move material multiple times. Steve said the construction costs for a given tank will be similar. DOE will have to question whether it is cost effective to move the waste more than what is necessary.
- Pam said RAP had a discussion at their meeting yesterday about the site-wide Resource Conservation and Recovery Act (RCRA) permit. She is aware that when DOE transfers waste, they need to use pipe-in-pipe with leak detectors. Pam asked what happens when the waste reaches the old junction boxes. Steve said when DOE is transferring between DSTs they use pipe-in-pipe. The outer pipe drains into a diversion box or a pit. The inner pipe connects to a jumper that connects to the other side. Steve said the pit acts as a leak protector. He said DOE requires periodic inspections to check for cracks and to make sure the secondary containment capability is intact.
- Dick asked if the old transfer boxes are rated. Steve said there are a lot of old pipelines and diversion boxes that DOE has no intention of using. Some of the old units were used during interim stabilization of salt-well piping until they became unreliable. DOE tested all these units, but there were problems with pipelines clogging or being unfit for use. DOE would dig a shallow trench that would be reinforced with rubber. Steve said DOE still needs to decide how to address the more remote tank farms that are not near a DST. The distance poses a challenge. The current lines already in place cannot be used, although there might be some diversion boxes in the K Area that can be used.
- Dick said there had been some discussion on pipe-in-pipe going into the boxes, but there was no mention of where the elements met. Steve said DOE has been updating the pits

and drilling cores into the diversion boxes. The older pipes are no longer in service because of that. He added all pipes being used are not pipe-in-pipe, which took several years to accomplish.

- Al said reusing the tanks had been mentioned and that 100 thousand gallons were relatively easy to remove once put in a tank. He said if easy to remove waste is put in a difficult waste tank, that easy waste becomes difficult. He asked if there was a strategy once the difficult waste is reached. Al said maybe DOE could consider a facility that addresses the issue. Steve said that question would need to be answered when working toward permission to remove the tanks. He said DOE would hopefully have an answer later.
- Al said if all materials are combined into DSTs, there will be numerous types of difficult to remove waste. Steve said there is no one type of material that is hard to remove. By the time waste is removed from one DST it may contain heavy materials that will sink to the bottom of the tank, making them tougher to remove. Steve said wastes that have been sitting for decades at the bottom of a tank can be very difficult to remove.
- Dirk suggested TWC schedule a discussion on possible advice development for this topic.

System Plan Rev 6

Dick said the System Plan Rev 6 efforts have been ongoing for quite some time. He said the IMs had productive meetings with DOE and Ecology. Dick said these kinds of interactions are very useful and important because it allows face-to-face discussions. Dick said he and the other IMs (Dirk, Al, Harold Heacock, Meme Samkow) were able to make progress in sharing their thoughts with people doing the work.

Dick said the IMs drafted advice based on these meetings which Cathy distributed. He said TWC will likely continue tracking this issue in the future and the possibility of developing future advice. Dick added that DOE and Ecology appreciate hearing the committee's thoughts informally.

Agency Perspectives

Ron Koll, DOE-ORP introduced himself as well as Kitty Bryan, MSA, and DaBrisha Smith, DOE-ORP. Ron said he will be on sabbatical for four months. Kitty and DaBrisha will be covering in his absence.

Kitty provided an update of DOE's progress on the System Plan process. DOE has attempted to incorporate previous Board advice on the System Plan throughout the process. She said it is an integrated team effort.

Kitty said the IMs discussed those previous advice points during the last meeting. She said Advice #238 "System Planning Process" focuses on a simplified picture of how the system planning process evolves. Kitty said there are performance measure baselines involving the definition of technology approaches with the associated cost and schedule. The baseline also defines a set of assumptions. She said it is an annual iterative process where a set of DOE-ORP assumptions are produced. DOE used the Hanford Tank Waste Operations Simulator (HTWOS) to develop a system planning model that can track waste throughout the treatment process. The HTWOS model results produce a base case, which is the underpinning for future analysis. Kitty said it is important to note that a System Plan is not a trade study. Cost and schedule are submitted to Congress and the results lead to a Risk Management Plan. Results may indicate DOE is not able to retrieve waste from certain tanks at the expected rate, which is a risk.

Kitty said the Board should be considering what will affect progress both in terms of cost and schedule. She said DST space is an issue that could lead to increased costs for fluid treatment and an impact on the schedule. Kitty said if tank treatment is introduced out of the risk plan, risk can be reduced by an estimated cost or schedule value. She said DOE will write a change request indicating that they will use tank treatment. The process for moving forward is very structured.

Kitty said the Board recognizes that DOE has been working with them in a collaborative manner. The Board asked for key dates in the system planning process and when Board input would be most useful. Kitty said DOE began planning System Plan Rev 6 with the other agencies in July 2010. She said that was finalized in October 2010. DOE approved the assumptions in February 2011. Kitty said the large timeframe is due to the assumptions associated with the alternative analysis provided.

Kitty said that as DOE moves into the actual modeling phase after going through the approval process, they will transmit the approved changes to the Board. She says these changes are minor, but DOE will continue to update the Board on the latest information. Kitty said DOE will continue discussion with IMs between Board briefings and she anticipates receiving advice from the Board on this topic. Kitty added that the framing of System Plan Rev 7 will begin in August before System Plan Rev 6 is completed. DOE will begin building the models for System Plan Rev 7 within that time frame and it will be issued in October of 2012. System Plan Rev 6 will be issued by October 31, 2011.

Kitty moved into a discussion of the modeling scenarios. She said once the scenarios and assumptions have been identified, DOE runs an HTWOS model on the data. Kitty said the team

framing the scenarios included people from DOE, Washington River Protection Solutions (WRPS), and Ecology. A technical person has been brought in to examine what occurred within each scenario. Preliminary results were available for eight of the ten scenarios by the entire team, but one of those eight is not being reviewed because of several issues. Kitty referred to the handout she provided to the committee and said the modeling scenarios in green have preliminary results.

Kitty said DOE is proceeding with all the scenarios, but there will only be one baseline case for the performance measurement baseline. She said they still have not decided what will be included in System Plan Rev 7, although she is fairly certain they will not be running all ten scenarios in the coming year.

Committee Discussion

- Dick said HTWOS is basically a technical performance model. He said there is no way to consider the cost aspect. Dick said it is critical to have a cost analysis associated with the alternatives. He does not see any evidence that would indicate which alternatives are more or less costly. Dick said he recognizes the value of a technical plan without cost impacts. He said DOE is revising the HTWOS to incorporate a lifecycle cost model.
- Jerry Peltier said he noticed a point on the final slide that a delay in the WTP would impact the tank farms. He asked if that would be going into the cost scenarios as a realistic alternative. Kitty said mitigation actions will be required if WTP does not begin operations on schedule. DOE wanted a driver that would force them to examine constructing new DSTs if WTP is delayed. She said this is in the milestone requirements.
- Jerry suggested DOE consider building tanks aboveground with catch basins below them. He said he firmly believes in the secondary confinement with DSTs. Jerry said if DOE constructed another tank farm to supplement the delay of WTP, he cannot believe another 70 years would be needed for the plant to process all materials. Kitty said DOE recognizes they have both a retrieval and a treatment mission.
- Jerry said there is no longer a deep repository for storing wastes so DOE should consider placement of vitrified logs. Kitty said DOE must look at storage options on the Hanford Site and shipping facilities among other issues. She said that will be part of the larger focus in the next System Plan. Steve said DOE recently released a report detailing the impacts of Yucca Mountain no longer being available.
- Pam asked Steve if DOE is seeking funding in 2012 to start work on the critical decision. Steve said he is not positive, but believes that is the case.

Systems Plan (Revision 6) Draft Advice v1

The committee moved into a discussion of the Systems Plan Draft Advice v1 that was sent electronically to the TWC prior to the meeting.

- Dirk said the advice is structured differently than most Board advice. He said one piece of feedback he received is that the advice reads more like technical recommendations than policy advice. Dirk said the Board should always ask themselves what the policy point is they are trying to address with each piece of advice. He said thinking on those terms will make the advice more clear, especially for those not involved in the technical aspects.
- Harold said the Board needs to remember the System Plan process is very complex and has been on-going for four or five years. These Revs are nowhere near complete so Board advice at this point is more of a checkpoint discussion. Information is continually interchanging as new data becomes available. Harold said the current draft of the advice is written to recommend important considerations for DOE to take into account through the process rather than the final position of the Board. Cathy said these points would be a good way to introduce the advice to the Board.
- Dirk said one point he might want to add to the advice is that the System Plan Rev does not specifically address which alternatives should and should not be considered. Meme agreed. She said they should clarify if baselines or alternatives are being referenced. Dirk said there are also alternatives he thinks should be studied, which are not in the System Plan.
- Dick asked Ron how he feels about the format of the advice. Ron said the majority of those who would examine the advice are scientists and engineers who would have no problem receiving this advice. He added that they cannot always expend resources on answering long questions. Ron said he would like to follow-up on TWC's comments about an iron-phosphate glass report potentially being released. He said he has not heard anything about that and would like to see the document.
- Dick said DOE is obligated to respond to all Board advice. Kitty said when Board advice comes in, the advice is reviewed line by line. She understands the Board's Charter is policy-based, which can make it difficult to respond in a professional or responsible manner on some of the discussions. She said the draft advice is very germane and implementable, which makes it useful. She said some of the technical questions will require some intensive investigation to determine an answer.
- Meme asked what the appropriate format is to approach a technical question or advice. She asked if there is another format for addressing those technical questions. Kitty said there are many intelligent people on the Board so it is very important to listen to all

points they bring forward. She said she hopes the Board reads through the System Plan and has the internal expertise to understand it. That is the first filter. The second filter involves holding discussions such as the one today. The third filter is to pull everything together into advice that DOE can address, recognizing there are thousands of technical questions.

- Vince said the background should be short and succinct. He said the Board needs to focus on the policy advice portion. Vince said he is concerned the Board is losing focus as several recent advice documents have similar issues.
- Jerry said the Board should look at advice from DOE's perspective and understand what their expectations are. The Board should also consider how they are expecting DOE to respond and what actions the Board would like DOE to take. He said the Board has offered advice with questions that are almost impossible to answer.
- Dick suggested putting all the technical suggestions under one advice point. Kitty said some of the advice points may initially appear to be technical, but actually offer good policy-level recommendations.
- Harold said there are new policy considerations as new issues arise from the studies being conducted. He said one of the real policy issues is whether the current budget planning and future funding match requirements for completing the work. Harold added that this advice is not the Board's final word on the System Plan because it is a work in progress.
- Larry said many of the points in the advice can be incorporated together. He said it is possible to reach a policy level without losing the technical points. He recommended TWC reevaluate the advice from a policy perspective and focus on shortening the language.
- Harold said the next revision would need to be ready in the next week to be ready for the June Board meeting. Larry said advice development is a growing process. The Board needs to recognize where they are today and where they were in the past. The advice can be fine-tuned to bring to the June Board meeting, even if they do not meet all of DOE's expectations.
- Larry said the Board could also append additional information to the end of the advice. Maynard said RAP has used that approach a number of times.
- Dirk said he edited the draft advice with committee comments in mind and would send this latest version. He suggested the committee break for lunch and then review steps forward and possible advice points later in the afternoon.

241-C Tank Farm – Tank Removal Study

Vince introduced the next agenda topic: The 241-C Tank Farm Removal Study as an IM for the issue. He thanked DOE for making the tank closure documents available on their website and encouraged the entire committee to review those documents. He said the document covers clean closure and landfill closure. Clean closure would involve the complete removal of tanks. Vince complimented the document's authors on a fantastic job laying out every aspect that would need to be considered for removing a tank farm.

Vince said one of the fascinating points in the document is the mention of a possible structure covering the entire tank farm. He said he had always questioned the possibility of cutting up a tank, but the authors offer a conceptual way to achieve this that seems fairly reasonable. Vince said the TPA milestone for closing C Farm by 2019 also has political motivations. He asked if DOE plans to cut the tank pieces down to the size of a board or wall and put them on train cars to be transported to the Environmental Restoration Disposal Facility (ERDF). Vince said that when waste is stored in a tank, it is in a safe configuration. Vince does not think it changes the overall performance assessment if the tank is cut and pieces moved to ERDF. He said the risk of the contaminants still exists; the risk has just been moved to ERDF. He said it seems the contaminants would be more exposed because the tanks are being cut into smaller pieces. Vince said there might be some advice development from the presentation.

Agency Presentation

Chris Kemp, DOE-ORP introduced Joni Norton, DOE-ORP who mentioned that DOE created a new communication tool to talk about the removal study. Joni said she had been at DOE for three years, first at DOE-Richland Operations Office and then at DOE-ORP. She spent seven years in Nevada working on transuranic waste. After that project closed she was moved to the Hanford Site.

Joni said DOE's new communication tool was useful to describe the reasoning behind the Tank Removal Study and some of the challenges. She said there are retrievals and a closure project. Retrievals are currently on-going where waste from SSTs is being moved to DSTs in C Farm. The closure activity is mostly in the planning stages. Joni said there is some soil sampling occurring and the tank removal study is part of closure planning. She said the TPA milestone is to complete retrieval in C Farm by 2014, which covers 16 tanks. She said retrieval is complete for six of the tanks. DOE is currently working on either sampling or retrieving in nine tanks. The goal is to close C Farm by 2019.

Joni said there are a number of drivers in the decision making documents. One driver is tank integrity, which is the reason waste is being moved from SSTs into DSTs. There is a need to

provide a good waste feed for the WTP. Joni said the key activities are tank farm closure planning, transferring waste from SSTs to DSTs and tank chemistry in the DSTs. Joni mentioned the Tank Closure and Waste Management EIS. She said no choices were being made in the EIS. The EIS will help determine risk decisions that can be made for the vadose zone. DOE needs the completion documents for closure to make those decisions.

Joni said there is a performance assessment for C Farm, which has been going through scoping sessions for approximately a year. That assessment should be available next week, which will look at the facility down to the groundwater. She said the poor integrity of the tanks led to some leaking and those are more challenging to retrieve waste from.

Joni said the Mobile Arm Retrieval System (MARS) will start to be used on Tank C 107 over the summer. There is still a large question mark over how exactly the retrieval will be conducted. DOE learned a lot from C Farm that can be used for future work in other farms. She said DST space is always limited. Joni said whenever DOE is retrieving waste they must keep in mind how much space they have to work with. She reviewed two planning schedules DOE is following, which cover the timeframe from the present time until closure in 2043. Joni said the schedule is based on System Plan Rev 5.

Joni said DOE had to make assumptions for the closure schedule. She said one of the assumptions is that DOE will use landfill closure, which is what allows the schedule to be viable. Joni said decisions need to be made by upper management so the schedule may be modified. The plan currently shows C Farm will require 13 years. She said adding 13 years to each tank farm would have a huge impact on the schedule.

Chris referred to a handout he provided entitled "WMA-C Tank Removal Feasibility Study." He said the study is required for Consent Order milestone M-45-80. He said the milestone is a basis for how DOE should approach closing C Farm. Chris said there is a description of the radiation determination process and RCRA/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process plus an evaluation for removing waste from the C-301 Catch Tank. He said DOE worked closely with Ecology prior to submitting those documents, which are currently in review with Ecology.

Chris said DOE did look at the EIS and discussed how those corresponded to M-45-80. He said assumptions were made about removing soils and the tanks themselves. The data packages support the EIS. Chris said DOE examined exhuming five feet below the tanks and removing the tanks at soil level. It would cost approximately \$800 million to remove the tanks and the soil, which covers 16 of the 149 SSTs. Removing the rest of the SSTs would cost more than \$8 billion. Chris said there are schedule delays for carrying out this large amount of work because the process involves more than simply removing soil. He said much of the work cutting up the

tanks must be done remotely. Chris said there are 800 cubic yards of material that must be dug up and disposed of.

Chris said an important point for him is the 200,000 mrem dose to the workers for work being done remotely to every 13 years. He said retrieving the tanks themselves plus five feet below the tanks removes 30 percent of the contamination currently existing in the soil. That is not clean closure. He said the volume of material removed must go to ERDF. Studies indicate the procedure can be done, but there will be some trade-offs. Chris said he does not see where there would be reduced risk to the public, although he does see reduced risks to workers. There is also a reduction in the cost and a schedule delay.

Regulator Perspective

- Jeff Lyon, Ecology, asked if the numbers are for treated waste going to disposal. Chris said there are no calculations, DOE assumes the soil removed will meet waste acceptance criteria.
- Jeff asked how DOE measures dose and what the maximum dose per year is for an employee working in the tank farms. He said Ecology measures dose either through a direct reading or through known mcuries in the soil. John Price, Ecology, said 500 mrem is the administrative control limit. The projected dose for the 241-C Tank Farm would be equivalent to 400 workers receiving their entire administrative dose for this project alone. Jeff said if the project was projected to take 13 years, DOE could divide the dosage among the number of people expected to work on the project.
- Jeff said one element he wanted to highlight was the assigned cost in the report. He said whether it is considered conservative or generous, there is a cost and a timeframe. There are tradeoffs that need to be made especially since C Farm is one of the simplest and easiest of seven farms. Jeff said he did not think the mark was missed for the milestone package. Comments were received and issues resolved, but DOE has not decided on the form of the permit or what information will be used. He said the EIS is the critical element in decision-making. Jeff wanted to reiterate that Ecology is obtaining as much data as possible on the soil. He said the performance assessment is a difficult process. Everyone is concerned about the nuances of modeling. Jeff said every year they wait to take action, they are exposing people a little bit longer. He asked the committee if they agreed with pushing back the tank farm milestone another 13 years. Jeff also said the committee should consider the risk benefit of digging up the tank farm versus the high cost.

Committee Discussion

- Liz Mattson asked over what timeframe people would be receiving doses. Chris said the doses would be incurred over the 13 year job cycle. Jeff said management always keeps worker safety in mind and it can take a long time to plan for that. Chris said people are receiving that dose and minimizing doses are very important for DOE. He stressed the importance of worker safety.
- John said that a possible piece of advice for the Board could be whether it is worth dosing that many workers for the environmental benefit.
- Dick asked how the dose is accumulated in terms of lifetime exposures. Chris said he does not remember the number of workers in the study.
- Vince questioned how to cut through the dome without having pieces fall to the bottom. He also questioned how the tank itself would be cut. He asked if a worker would do the work, get the maximum dosage in a week and then have to go home. Vince said the document states some containers need to go to ERDF in order to control the dosage. He said DOE would have a company build a large container made of six inch thick steel, which would be very heavy.
- Keith Lokkins, DOE-ORP, said scope creep was a big concern for a study such as the 241-C Tank Removal Study. He said DOE attempted to capture some of the key concepts, such as the practicability and feasibility of excavating material. He said the first step would be to construct a building over the tank farm, which would require building a load-bearing wall in the middle for stability. The wall would need to be pre-dug with concrete footing. Then the dome could be removed. He said the FS does not get down to that level of detail. Keith believes there is a feasible method for removing the dome so it will not fall into the tank. It will all be done remotely and the technology does exist. Keith said ERDF does have size criteria for the pieces. For one of the studies, DOE assumed a box would be 20 feet by 70 feet by 5.5 feet. Those are some big boxes for a truck to be able to load and unload. Keith said he assumes ERDF would have acceptance criteria for the boxes and DOE would have to meet those criteria.
- Vince said there is a fundamental difference in waste criteria at the bottom of the tanks. The bottom has residuals that cannot be removed. Keith said the assumption is DOE will pour a layer of grout on the bottom to cover the residual and then remove the material. Vince said before the dome is removed, grout should be poured on the bottom as protection against contamination. Keith said that material would still need to be placed in the boxes. He assumes it can still meet ERDF acceptance criteria. The rest of the box would need to be filled with dirt.

- Larry said John made some excellent points on worker safety versus environmental benefit. Jeff gave an excellent summary on every aspect from cost criteria, schedule, exposure, volume, etc. He said for him it comes down to risk. From a regulatory standpoint and TPA milestones there are huge risks, partly associated with people versus the environment. The regulatory requirements would not permit tanks to be left in place without a liner. The TPA regulations would have to be changed because DOE now recognizes there are much greater risks from moving contaminated material to a landfill than the risks of leaving it in place.
- Keith said the TPA would not need to be changed. The EIS is examining clean closure versus landfill closure. He said as they are discussing transporting material to ERDF, they are talking about an additional 800 mrem worker dose compared to the dose received by a theoretical intruder to the site. He said that risks are not in the document until after 30 years.
- Larry asked what the total cost estimate for removing 241-C Tank Farm is. Chris said it is approximately \$800 million. He said Jeff had rounded that figure to one billion.
- Dick said one of the real tradeoffs is the cumulative groundwater dose over the next thousand years. Chris said there are several iterations of the study concerning clean closure and partial clean closure. He said the EIS is a good piece of work. Jeff said the EIS will illustrate some of the impacts for various options.
- Susan Leckband said she is glad to hear a discussion on the EIS. The Board has been involved with it over the last two to three years. She asked when the document will actually be out. Joni said she heard the draft will be out this month or the next for internal comments. The final draft will be available sometime in the winter of next year. She believes it will be sometime in January 2012, but has heard the EIS could be available as early as November 2011. She said six months after the EIS is out the ROD will be issued, which will occur based on the above timeline, in June 2012.
- Tom said he is less concerned about the tanks going somewhere than material under the tanks. Tom said tanks can be evaluated to determine which ones should be removed, such as those tanks that leak the most. He said there will be a trade-off in terms of cumulative dosage for the future. There is no way of reversing contamination that enters the groundwater or the environment. Tom said that there is still a risk of contamination from waste stored at ERDF. He said the Board should think more broadly about the alternatives.
- Dirk said one of the problems with how the entire Tank Removal Study is structured is that from the Board's point of view, they do not expect to see the tank farms closed

within their lifetimes. The contamination under the tank farms is much greater than what is within the tanks themselves. Dirk said closing the farms with caps and barriers may actually inhibit solving major problems. The cost may be greater and the schedule may be delayed. He said the reason for tank closure is to stop contaminants from moving to groundwater. DOE should determine what the actual problems are. Cesium is less of a problem than some of the other contaminants because it binds to the soil and does not move very much. He said it is likely that many contaminants in C Farm have been washed laterally through the soil and will begin to turn up in the groundwater over the next century.

- Dirk thanked Keith for preparing the report. Keith said he spoke with many people conducting excavations in the 100 Area. He examined the AX Tank study and the EIS to ensure those documents concur with the schedule and other information. These documents did contain similar information so he believes the Tank Farm Study corresponds to the reality of the situation. Dirk said that was heartening to hear, but cautioned that facilities tend to cost more and excavation tends to cost less. He said remote operations are common in Europe for demolishing buildings and working with hazards. Dirk said that should be applied at the Hanford Site. He said designing the work correctly will eliminate much of the dose received by workers.
- Al said he is concerned about the concept of excavating soil only to bury it in another spot. He said when DOE first considered C Farm, they discussed washing the materials. He said the amount of material being reburied at least ought to be a smaller amount than what is being excavated. He asked why the soil being reburied is not being treated. Keith said that was not considered because it was not part of the report scope. He said that type of consideration would be examined in a larger study.
- Al asked what the additional cost of treating the soil is. He said there is a lot that can be done to reduce the environmental release. Keith said DOE adds grout to stabilize the material when it is placed in boxes.
- Jeff said the administrative plan was designed with specific intentions. He said if the Board is comfortable with the assumptions being made, they should consider the next big concern. He added that he is not sure it is possible to ever reduce the dose to workers in the field. Al said they can reduce exposure to the environment. Jeff said that will be determined in the alternatives study.
- Maynard said voids in the boxes must be eliminated. He asked if materials needed to be compacted. Keith said the dirt is usually compact enough and the criteria simply require there not be any free space.

- Maynard asked about how contaminants from soil around the tanks could be removed without removing the tanks themselves. He said there would be high cost and high dose rates. He said the soil cannot be left where it is. He said the Board might be able to accept the idea of landfill, but possible Board advice may emphasize leakage and the vadose zone.
- Vince asked if TWC was near a point where they could develop advice. He said Jeff mentioned one possible advice point that the closure should be driven by risk and the potential benefit. If improvements in risk cannot be seen over the long-term, those efforts may not be worth the time and cost.
- Vince said removing the tanks is not a standard job. DOE does not have a lot of experience excavating tanks so there will be unexpected problems, such as equipment breaking or the discovery of very hot material. The cost might exceed \$2 billion by the time the project is complete. Keith said there is a 50 percent contingency built into the cost estimates.
- Vince thanked Chris, Joni, Jeff and John for their comments and their efforts on the document. He said the document is very readable and suggested all TWC members read it.
- Susan said she had one suggestion for the IMs. She said September might be too soon for the advice. She suggested the IMs frame the advice beginning with their values, such as vadose zone protection and worker safety. Then the IMs should ask what actions are necessary to fulfill those values.

Committee Business

- Dirk debriefed the leadership retreat. He said the previous year committee leadership identified five big issues that they wanted the committee to address over the coming year. Then the agencies went through the same exercise. He said this year DOE provided a draft letter in advance of the meeting with their suggested priorities. Dirk said those priorities matched the priorities envisioned by himself and Larry.
- Larry said there was a lot of discussion on budget. Dirk said the Fiscal Year 2012 budget has been reduced ten percent. He said the Board can function with the decreased budget, but will need to be diligent on how work is conducted. He said that the Board was considering how to use technology more extensively. Larry said the Board is also considering not holding committee meetings every month, especially during the holidays

and in July. Cathy said Susan and Bob Suyama will present a full report on these recommendations at the June Board meeting.

- Susan said the EIC develops priorities for the Board first and then the agencies provide a draft letter with their priorities. She said they discovered it was very helpful to have a draft from the agencies when the Board developed their list of priorities. The TWC priorities were very close to priorities of the agencies. She said there probably will not be many changes to the draft. She added that the committee can always add more to the work plan as new issues emerge.
- Larry mentioned discussions on bringing in younger people, possibly through internships. He said the Board needs to ask if they have the right mix of people and a diversity of people. Larry said there might be some people on the Board who are not necessarily supporting the Board.
- Cathy said the EIC discussed some of the processes and areas in need of refinement in terms of advice development and issue manager roles and responsibilities. She said they would be working on some revisions to the process manual and that EnviroIssues will offer a presentation on resources available.
- Liz said she would like to involve more Board members who do not usually write advice or act as IMs.
- Maynard said the difficulty in recruiting young people is that they are working. He said the Board has talked about how to make young people available without requiring them to use up their vacation time. Maynard said many young people would be interested if they could have the time off from their work. He said DOE and the contracts should look into ways to permit that.
- Susan said there are already two non-union, non-management seats with two alternates. She said EIC also has discussions about holding meetings in the evening. Maynard said he was not suggesting additional Board members; he is thinking more in terms of replacements for current Board members. Pam said there were 80 applicants for the non-union, non-management seat. She said those applications were not terribly diverse; most were over the age of 50. Pam added that institutional knowledge is very valuable and she asked about creating an oral history project.
- Becky Holland, Hanford Atomic Metal Trades Council (HAMTC), said some people do not think attending Board meetings are important and her work questions the need to attend.

- Susan said the different interests making up the Board should propose who they would like to have representing them. She said they could propose younger members and work with agencies to obtain relief from contractors.
- David Bernhard said he wrote a letter asking contractors to encourage any of their staff members who are chosen to be on the Board. He agrees that it would be beneficial to involve younger people, but it is up to the interest group to select their best representative.
- Liz suggested holding a sounding board at the June board meeting to hear broad ideas on how to increase the involvement of young people on the Board.

The committee updated their six month work plan. In June TWC will hold a meeting to discuss: DOE Order 435.1, the closure schedule for Waste Management Area C with a performance assessment IM update, and RCRA/CERCLA integration.

The committee then returned to the discussion on the draft advice for Systems Plan Rev 6. They thoroughly reviewed the draft and changed much of the wording in the advice, focusing on how to shorten the information and focus on a policy-level perspective.

Handouts

- System Planning Process. Washington State Department of Ecology and DOE-ORP May 12, 2011.
- Systems Plan (Revision 6) Draft Advice v1.
- WMA-C Tank Removal Feasibility Study.
- Now is the Time to Discuss Closure, May, 12, 2011.

Attendees

HAB Members and Alternates

David Bernhard	Rebecca Holland	Vince Panesko
Allyn Boldt	Pam Larsen	Jerry Peltier
Tom Carpenter	Susan Leckband	Maynard Plahuta
Dirk Dunning (phone)	Larry Lockrem	Meme Samkow
Harold Heacock	Liz Mattson	Dick Smith

Others

Chris Kemp, DOE-ORP	Suzanne Dahl, Ecology	Nicole Addington, EnviroIssues
Ron Koll, DOE-ORP	Jeff Lyon, Ecology	Cathy McCague, EnviroIssues
Pamela McCann, DOE-ORP	John Price, Ecology	Kitty Bryan, MSA
Joni Norton, DOE-ORP	Ginger Wireman, Ecology	Reed Kaldor, MSA
Steve Pfaff, DOE-ORP		Anna King, Public Radio/News (phone)
DaBrisha Smith, DOE-ORP		Michele Gerber, URS
		Keith Lokkis, WRPS
		Keith Quigly, WRPS
		Rob Roxburgh, WRPS

Attachment 1: Transcribed Flip Chart Notes

Potential Advice Policy Points – Worker Exposure

*wait for September (not ready for June Board meeting)

1. How much exposure is accumulated over time for how many workers to close a tank?
Did they go over the OEL?
 - a. More clarification for does/year/worker for digging up tanks
2. What are the acceptable thresholds?
 - a. Improvement in long-term risk
3. Long-term environmental consequences
 - a. Leave tanks or dig tanks up
 - b. What is the exposure to the environment?
4. Put more emphasis on vadose zone
 - a. Address soil problems under tanks
 - b. Are there technologies out there for drilling waste out of tanks? Directional drilling?

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Enhanced Tank Waste Strategy Advice Policy Points

5. Start-up of WTP mission
 - a. Which project to support it
6. Priorities for looking at strategy
 - a. What is most important?
 - b. What are the must haves and have nots?
7. Use of rotator microfilters and ion exchange columns
 - a. Does it get waste treated?
 - b. Does it further the mission?
8. Case of building less stuff
 - a. Address HLW
 - b. Increase in temperature
 - c. Put that case in ETWS
9. Developing approach of how to handle difficult waste when moving from SSTs to DSTs

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Next Steps

10. Sounding Board at next Board meeting on how to encourage new, younger Board members
11. Address idea of internship

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