

**FINAL MEETING SUMMARY**

**HANFORD ADVISORY BOARD  
TANK WASTE COMMITTEE MEETING  
May 12, 2006  
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**

Rick Jansons, Chair of the Tank Waste Committee (TWC), welcomed the committee and introductions were made. There were no proposed changes to the March meeting summary and the committee adopted the summary.

The first portion of the meeting regarding the external team report on the Waste Treatment Plant (WTP) estimate at completion (EAC) was a joint meeting with the Budgets and Contracts Committee (BCC).

**External Team Estimate at Completion (EAC) Report**

Rick explained the purpose of the presentations to the committee on the external team report on the WTP EAC is to help committee members evaluate the Department of Energy – Office of River Protection’s (DOE-ORP) responses to the EAC report. The Defense Nuclear Facilities Safety Board (DNFSB) and the Army Corps of Engineers (ACOE) were unable to attend the meeting to provide their perspective on the recent EAC, but the committee will ask them to attend a future meeting.

Tom Perry, Government Accountability Office (GAO), presented a summary of GAO’s testimony on the TWC EAC before the U.S. House of Representatives Subcommittee on Energy and Water Development and Related Agencies, and the Committee on

Appropriations. The GAO audit had three objectives to determine how and why the WTP cost and schedule changed: 1) how and why the project's cost and schedule have changed since the contract was awarded to Bechtel in December 2000; 2) the status of DOE and Bechtel efforts to address these causes and establish effective management controls over the project; and (3) GAO's observations on issues that need to be addressed as the project moves forward.

- Objective 1: In general, the GAO found that the WTP construction project's estimated cost has increased over 150 percent to just over \$11 billion since 2000, and the completion schedule has been extended by six years to at least 2017. These increases are primarily a result of three main causes: 1) contractor performance problems, including underestimated contractor hours, key commodities, contingency funds, difficulty establishing a nuclear safety culture; 2) DOE management shortcomings (i.e., DOE's emphasis on a fast-track/design-build approach and inadequate project oversight; and 3) difficulties addressing technical challenges encountered during design and construction (e.g., seismic, pulse-jet mixers, changes in plant design), which added an extra \$1.4 billion to the project. Since a new EAC is being prepared, the project cost and schedule baseline is unknown. The GAO is interested to see Bechtel's revised EAC, which is scheduled for release at the end of May.
- Objective 2: The GAO evaluated efforts by both Bechtel and DOE to address the causes of WTP cost and schedule increases and establish management controls. To address project cost and schedule problems, DOE and Bechtel have focused on slowing down construction to increase the gap between design and construction, addressing technical and safety problems, establishing new project cost and schedule estimates, and strengthening project management and oversight. Bechtel is in the process of developing a new EAC and hired external teams to review technical issues and the revised estimate. The GAO is encouraged by these actions.
- Objective 3: The GAO identified three main issues and concerns to be addressed moving forward with the project: 1) the use of the fast-track, design-build approach, 2) reliability of the revised project cost and schedule baselines, and 3) adequacy of management actions taken to ensure appropriate project management and oversight and contractor performance incentives.

GAO's report recommends:

- 1) Discontinuing the fast-track, design-build approach. Consider completing 90% of the design before continuing construction.
- 2) Ensuring that revised baselines reflect remaining uncertainties. Include all uncertainties in the baseline before deciding to move forward.
- 3) Establishing improved management controls, including revising contractor incentives and strengthening accountability on the project.

John Eschenberg, DOE-ORP, presented an update on the status of WTP design and construction and what DOE is doing to restore confidence in facility construction.

The WTP construction project is an unprecedented challenge, and DOE and contractor performance has not always been perfect as a result. John discussed five major problems with the WTP construction project:

1. DOE should have managed the separation between engineering and construction more effectively.
  - Going forward, the project will have at least a 12-month delay between design completion and the start of construction. This will establish a lag to allow engineers, designers, and planners to address technical and safety problems that may arise and still meet the end date.
2. DOE should have been more realistic regarding the capabilities of the U.S. supporting nuclear industry.
  - DOE has dedicated over \$20 million to bolster the project's quality assurance (QA) processes.
3. DOE should have been more pessimistic in developing cost and schedule estimates.
  - In its review of the EAC, ACOE will have spent nine months estimating a new cost and schedule basis. This is the most comprehensive and detailed validation review ever conducted.
4. DOE should have matured some of the supporting technologies before completing the design.
  - Several issues were identified by the "best and brightest" expert review team, which need to be addressed.
5. DOE should have had a more adequate amount of contingency built into the design.
  - DOE will have significant additional contingency (as much as 30% more or \$3 billion) in the revised EAC.

John discussed some positive activities. The WTP project has solved the design issues identified to date. Design is about 70% complete, and construction is 30% complete. Several facilities have added capacity.

John said the goal for DOE and its contractors is to restore project confidence and credibility at all levels. As the GAO has pointed out, the fast-track, design-build approach is not risk free. He noted that the "best and brightest" expert review highlighted 28 issues DOE needs to address. He believes the WTP project is on the road to recovery. Bechtel will provide their revised EAC at the end of May, and the EAC will be released in June. He said DOE-ORP needs to receive a consistent, stable amount of at least \$690 million in annual funding for the project to be successful and remain on schedule.

Craig Albert, BNI, outlined the composition of industry expert external review team and reviewed the specifics of the process and results.

The rationale for expert team EAC review was to provide an open, transparent review. The team reviewed the EAC produced by BNI in December, which set the project cost at \$10.5 billion. The team was composed of 16 individuals from the commercial nuclear industry, chemical industry, and academia. The cost review was phased so that it was done about a month or so after technical team review. Recommendations from both teams are incorporated into the review going to DOE. The cost team reviewed the scope of the project, contract requirements, management execution, project schedule, and cost estimate including contractor contingency. They also considered out-of-scope risks.

The conclusions of the expert review, which were released to public, included the following:

- BNI's EAC process and approach was appropriate.
- Comments and recommendations centered around:
  - 1) Need to address future economic inflation issues.
  - 2) Need to identify an available work force. A skilled operations workforce needs to be established to construct and operate the WTP in about 10 years. DOE will be competing with commercial nuclear utility operators for such workers.
  - 3) Include a higher confidence contingency for the remaining work scope.
  - 4) Risk definitions and assessment was generally adequate, but needs to address the "unknown unknowns." Need to add contingency allowance to accommodate this risk.

Specific recommendations from the expert review include:

- Shift some out-of-scope allowances to "in-scope" allowances in base cost estimate.
- \$1 billion should be provided for Technical and Programmatic Risk Analysis (TPRA).
- Strengthen contract management and risk management.
- Modify start-up and commissioning strategy to add confidence.
- Add to Bechtel's scope of work. Work on transition between Bechtel workforce and DOE when operation of the WTP is assumed by DOE, including hiring and training an entire workforce.

The impacts of the expert review include:

- The baseline cost estimate is expected to increase from \$10.5 billion in the December EAC, to \$11.3 billion in the revised EAC. With some additional costs, the EAC being released in May will be higher than \$11.3 billion.
- The schedule will extend about 18-24 months beyond 2017 for beginning operations.
- There may be additional cost increases above \$11.3 billion related to:
  - New DOE regulations
  - Transferring TPRA Risks (likely risks should be included in the baseline.
  - Considering other options to give DOE some flexibility

### Regulator Perspectives

- Suzanne Dahl, Washington State Department of Ecology (Ecology), said Ecology is concerned with the increasing WTP cost and schedule. Delaying WTP facility hot starts has environmental consequences, which makes it difficult for Ecology to consider. Once the WTP is operational it will treat waste for a long time, which will require operable facilities. The expert review identified some technical issues that should be addressed, but no review of the EAC done to date suggests it can be done cheaper or faster, which validates the current facility design path.

Suzanne said she believes fast-track is a subset of the design-build approach, where construction progresses too closely to design and procurement. She does not believe this is currently happening at the WTP. The design-build approach is used elsewhere, so there is no reason it cannot be used at the WTP; however, to be successful it has to be managed well. Ecology reviews 100% of the WTP design before any waste is put in vessels at WTP. DOE cannot move forward with any part of vessel construction before obtaining Ecology's sign-off on the design. This ensures facility design meets Ecology's needs before modifying procurement. Suzanne said Ecology provides a very detailed review of all the designs it receives. Ecology is encouraged by DOE and contractor efforts to increase the distance between amount of design completed and the corresponding progress of construction. Based on all the EAC reviews, Ecology encourages DOE to increase project and management risk oversight, and address technical and plant safety issues.

Ecology supports moving forward with the WTP construction project, rather than waiting until design is 90% complete as is recommended by the GAO. All the starts and stops the facility has experienced have resulted in cost and schedule increases. She commented that there is nothing fast-track about the WTP construction project considering the two decades of delay from political reasons, cost increases, and the fact that untreated waste remains in the tanks. Ecology will insist the WTP be completed to treat waste effectively and safely. The uncertainty issues identified in the WTP EAC reviews will be addressed, but the uncertainty related to the environmental soundness of the double shell tanks (DSTs) and single shell tanks (SSTs) also needs to be considered since it will delay the completion of cleaning those tanks.

### Committee Discussion

- Gerry Pollet, Chair of the Budgets and Contracts Committee (BCC), provided some questions from the BCC:

*How should DOE and its contractors proceed with completing 90% design before continuing construction work? Is the approach to reach 90% design outlined by the ACOE in its EAC review a variation of the GAO recommendation?* Tom said the ACOE approach is a variation of the GAO recommendation. The WTP facility component design addresses the need to have 90% design complete before restarting construction.

*The low-activity waste (LAW) vitrification plant is ahead of design. What is the GAO's opinion about moving forward with the LAW facility at a faster pace than 2018?* Tom said construction has halted on the high-level waste (HLW) facility, and he does not believe GAO's testimony addressed how DOE should move forward. However, since the LAW facility is a component of the overall plan, GAO's recommendation would be consistent, to complete 90% design before restarting construction.

*Does the GAO recommend performing independent cost estimates before restarting construction?* Tom said DOE should perform an assessment of the impact of uncertainties. Significant problems could result if DOE moves forward before major uncertainties are resolved.

*Some press account feedback suggests that if DOE waits to complete 90% design before restarting construction, the schedule for completing the WTP would extend beyond 2018. Rebuttals indicate it might be faster than the risk of conducting rework. Does the GAO believe waiting to complete 90% design would slow the 2018 WTP start date?* Since the revised EAC is being developed, Tom said the baseline WTP start date is unknown. Bill Swick, GAO, said the GAO does not support the fast-track strategy. Because the fast-track approach has not sped-up project completion, Bill said it is difficult to determine whether slowing construction down to complete 90% design will delay the project further. Tom said the nuclear industry guideline to complete 90% design before construction does not discuss using a fast-track approach.

- Jerry Peltier commented that the complexities inherent in constructing nuclear plants will necessitate design changes as plants are built. He said he does not have a problem with the fast-track approach, because no matter how hard DOE and its contractors try to get the design right, field conditions will be different and require design changes to be made. He noted this approach has been a common nuclear industry practice. Tom said the nuclear industry standard recognizes the problems with the fast-track approach, and indicated in 2002 that the fast-track approach will not be used. A number of consortia are designing the next generation of nuclear power plants, which are considering having detailed design at 90% or more complete before initiating construction. Tom said this is a turning point for building nuclear power plants. He said it is better to have spent hundreds of millions of dollars on design upfront than billions of dollars to fix construction down the road.
- Jerry commented that no clear baseline cost exists for the WTP. Tom said it is clear from the expert review report that even when design problems are resolved, the facilities will be difficult to operate and maintain. The GAO is concerned that a baseline cost for the WTP project has not been resolved after 16 years of planning.
- Harold Heacock said the GAO is consistent in promoting the need to complete 90% design before starting construction. There are differences between conceptual design and design that happens after major procurement. *How does the GAO define 90% design?* Tom said defining what 90% design means was one of issues for the GAO during its review. Based on discussions with experts, the GAO determined that 90%

design refers to the detailed design level. He said taking seven years to develop a sound design at 90% completeness, is better than having schedule delays and shut downs over 16 years.

- Al Boldt said DOE has not told Congress about the production costs associated with the demonstration bulk vitrification project. *Since the House Committee determined DOE will have to complete 90% design, involve the Nuclear Regulatory Commission (NRC), and operate with a reduced budget, what are the implications for the revised EAC?* John said he was unsure how DOE would deal with a Congressional mandate that provides a budget lower than DOE's anticipated annual project budget. He explained that DOE chose \$690 million per year as the necessary project funding level. The revised EAC did not consider the recently released House of Representatives funding level of \$600 million per year. He said it is not prudent for DOE to react to the House of Representatives funding level, since DOE has to identify and set an achievable project funding level and needs to wait for an official Congressional budget figure.
- Gerry commented that the DOE target funding request for Fiscal Year 2008 (FY08) is less than \$690 million per year. *Why was DOE's target figure not provided to Bechtel for consideration in the revised EAC?* John said the FY08 figure is currently approved by Congress, but there will be a modification of the existing appropriation. Gerry said it is confusing when the EAC is based on an annual figure of \$690 million, but everything is currently based on a figure less than \$690 million in FY08, which would require an over-target budget request. John said it was necessary to make some funding assumptions to extend the funding baseline to the end of the project.
- Paige Knight expressed concern about DOE's optimistic picture of the WTP construction project, which she believes is misleading the public. She also expressed concerns about the impacts the WTP project's increasing cost and schedule on the workforce and the cumulative loss of time and money. Craig said roughly \$3 billion has been spent on the WTP, and BNI's testimony about the mistakes that were made accounts for less than 1% of the total cost to date. The primary cause for the cost increase was an underestimation of what it takes to construct the facility. Gerry commented that the 1% figure attributed to "mistakes" is not a credible figure considering testimony from the GAO and ACOE about the reengineering associated with seismic and hydrogen gas issues. John explained that in June of 2002, DOE began to question structural issues. In June 2004, the Defense Nuclear Facility Safety Board (DNFSB) began to express concerns about soil stability, to which DOE responded. Bill said the GAO tried to be careful about terminology it used in its testimony. For example, when the GAO discusses technical issues it never said DOE "lost money," even though it is clear that addressing technical issues costs additional time and money. The GAO focused on trying to identify the avoidable mistakes that were made. The GAO did not develop a cost estimate for mistakes, because avoidable cost data were unquantifiable.
- Susan Leckband commented that there are clearly political drivers making technological decisions. The local DOE field offices are victims of DOE – Headquarters (DOE-HQ) mandates. She is encouraged to see DOE and its

contractors moving away from political motivations towards focusing on addressing technical challenges.

- *Gerry questioned the credibility of the funding profile for the actual cost estimate. Do BNI, DOE, and the GAO consider the \$11.3 billion cost estimate a bounding estimate?* Tom said a cost estimate is unavailable until the final EAC comes out at the end of May.
- Gerry commented that the public considers risks to be a logical part of a cost estimate. *Are risks really part of cost estimate, but just outside Bechtel's scope?* John said DOE does not have a current cost estimate. The revised EAC has roughly \$3 billion in contingency funding, which accounts for risks. Contingency funding is broken into three pieces: 1) things that can be reasonably predicted (market conditions), 2) government-held contingencies (complying with new regulations or statutes), and 3) unknown unknowns. DOE is comfortable that \$3 billion for contingency is appropriate. Suzanne said DOE seems to be developing a decent cost estimate. John added that around 100 people have reviewed the cost and schedule baseline, so their reviews should be listened to.
- Ken Gasper commented that as DOE considers the WTP workforce, the issue of attrition arises since the DOE complex seems to be moving in the direction of increasing attrition due to reduced benefits. *Has DOE considered the kind of trade-offs that could be put in place to help maintain a stable work force and reduce attrition?* Craig said that is outside the scope of the expert review, but BNI is considering this issue. Attrition considerations add to the challenge of keeping talented workers.
- Bob Parazin said the average age of Hanford workers is 48. *Does DOE plan to use people who are down-sized or bring in a new class of operators?* John said he believes the WTP will require about 1,000 operators. Finding new operators is a significant challenge across the country. The pool of WTP operators will come from the community, and John said he is considering engaging local technical schools.
- Bob asked whether Ecology reviewed vessel permit and placement before they went in, or did that happen without Ecology's knowledge. Suzanne said Ecology approved the permit before vessel installation. She said the vessel problems were not design issues, but were weld verification problems that should have been resolved at the shop.
- *Committee members were interested to know what would be done at the WTP in the interim period until 90% design is complete?* Tom said 90% design is a guideline, and is subject to judgment. DOE and BNI have to determine how to implement the GAO recommendation. He added that it makes sense to resolve any uncertainties before moving forward. Bill said BNI could continue to construct facilities that reach 90% design, such as the Analytical Laboratory.
- Bob expressed concern about the stability of the Hanford community and local governments resulting from a WTP construction delay. Craig said DOE and BNI need to define 90% design. He said it is important to note that all of the technical

issues to date have caused engineering work to be redone, not construction work. He said nothing is built until the engineering is complete.

## **END OF JOINT TWC & BCC COMMITTEE MEETING**

### **Double Shell Tank (DST) Integrity Report**

Steve Weigman, DOE-ORP, said the DST Integrity Report, which was developed in March of 2006, was motivated by the need to understand how to keep the system functional. The chemistry of tank systems is important, and determining the life of the DSTs is a priority for DOE-ORP.

Stewart MacKay, DOE-ORP, described how the report was developed and discussed the findings related to the estimated life of the DSTs. The report looked at all aspects of the DSTs, including structural requirements (which were determined to be good), ultrasonic (UT) testing done in all 28 tanks (a second round of UT tests will be done soon), and the chemistry of the tanks. He said the tanks are being maintained within the requirements. Since most of the DSTs contain just liquid waste, it is easy to meet the requirements. For tanks that contain solid waste, core drillings are done to determine the interstitial areas.

### **Regulator Perspectives**

- Suzanne said the DSTs are essentially full, and nothing will be removed from them. Ecology received the report and is reviewing the report's completeness, and is working with CH2M Hill (CHG) and DOE-ORP to obtain supporting documents. Ecology has an emergency pumping guide that stipulates how a leak in the DST system would be addressed and the integrity of the transfer lines during such an event. Some emergency pumping lines need additional pressure testing, and Ecology would prefer emergency lines be tested now, rather than waiting until they have to be used.

### **Committee Discussion**

- *Did the report look at welds as well as tank wall thickness? If so, what percentage?* Stewart said 5% of the welds were included in the report. Rob Davis said DOE should make it a priority to consider the other 95% of the welds that are not included in the report for stress considerations.
- *Are the welds still considered to be the weakest part of a tank?* Stewart said they are.
- *How is tank wall thickness assessed?* To assess tank wall thickness, Stewart said the codified stresses of the tank walls are considered, as well as computer analysis and survey markers.
- *How is tank liquid pH measured?* Stewart said DOE is measuring the concentration of three chemical species in the tanks: 1) hydroxide, 2) nitrate, and 3) nitrite. He said

pH is a lesser requirement, and is far less of a problem than measuring these chemical species. Dirk commented that it is almost impossible to measure the pH of high salt mixtures at Hanford. Stewart said DOE used to be concerned about the concentration of hydroxides in terms of tank longevity; however, work done on stress corrosion tracking has determined that hydroxide corrosion is much less important than nitrites. Nitrite is the biggest driving force in terms of tank integrity. Dirk was encouraged to hear DOE is considering nitrite as the main driver for tank integrity, since the standard practice used to be to use pH and hydroxide as measurement of tank integrity, which is ineffective.

- Susan said she hopes the report will be used in the decision-making process to ensure longer survival of DSTs and to determine the impacts of tank integrity on the waste feed to the WTP.
- Dirk commented that there are no clear standards indicating when a tank is at the end of its life and needs to be replaced. These criteria need to be developed. There are five tanks of concern based on current information. DOE should carefully consider these tanks to determine whether new DSTs need to be constructed. Stewart said results from UT tests in September will indicate tank wall thickness and help determine how long some tanks will last.
- Dirk expressed concern that the seismic standard being applied in the report is one that did not exist when the DSTs were built. Steve said part of the process to understand tanks and systems associated with tanks is to maximize their utilization. As conditions change, the function of the tanks becomes more and more important. The objective of the report is to identify DST vulnerabilities. DOE wants to avoid spending a lot of money to build new tanks. Stewart offered to provide an update to the committee in September.
- Rick noted that the tank integrity program is operated outside the WTP budget. *How does the reduced DOE-ORP budget (not related to WTP) impact this program?* Stewart said budget reductions will not impact the program over the next couple years; however, continued cuts over the next ten years will negatively impact the program.
- *Does DOE plan to go back and apply new knowledge at SSTs where chemical compositions have been compromised?* Stewart said DOE is not currently looking at SSTs. Steve said that decision is a matter of site priorities.

### **National Academy of Sciences Report**

Roger Quintero, DOE-ORP, provided information on the findings of the NAS report about tank residuals and DOE-ORP's response to the report. He said DOE is not obligated to issue an official response to the report, but will take the report under advisement.

Roger discussed specific recommendations on DOE-ORP's plans for retrieval and on-site disposal of certain radioactive wastes stored in underground tanks at three DOE sites.

The NAS notes the need for a more participatory and transparent process. DOE-HQ is considering funding some of the NAS recommendations.

DOE-ORP is not looking into post-closure monitoring. In addition, no closure EIS and ROD are being considered at this point.

Rick Raymond, CHG, presented information on the external review panel schedule and objectives for the demonstration bulk vitrification system. He said it is a technical review, not a detailed design review, and does not provide a cost and schedule review of the project. He noted that CHG appreciates public and Board involvement in the treatment technology testing process, and significant changes were made to the project in response to feedback from various advisory committees (HAB, DNFSB, etc). CHG is not authorized to begin construction until the external review panel is complete; however, design is currently at 80% and should be at 100% by July.

### **Regulator Perspectives**

- Suzanne said she participated in the video conference with DOE when the NAS presented its report. The presentation and report tended to focus on tank residuals, and did not deal much with LAW issues, except for Savannah River's efforts to dispose of LAW.
- Jeff Lyon, Ecology, said DOE is working on a demonstration project in the C Tank Farm to look at grout performance. He said the SST performance assessment would be used to look at SST closure.

### **Committee Discussion**

- *Does the \$10-15 million per year for technology recommendations apply to all DOE sites, or just Hanford?* Roger said it applies to all sites.
- *Does the NAS report discuss the benefit of using multiple technologies to remove tank waste?* Roger said that is part of the NAS report, but the report focuses primarily on Savannah River, where the amount of residual waste is more than twice what DOE is allowed to leave in the tanks at Hanford. Steve said that when DOE started removing waste from C 106 it could have saved money if the work to remove residual waste was done then. Due to cost and safety considerations, he is not supportive of conducting bulk retrieval work, and then going back into a tank later to remove residual waste. He said DOE-ORP can meet the TPA goals, which is its objective.
- Gerry commented that the NAS report seems to confirm concerns about DOE doing something irreversible before residual waste can be retrieved. Suzanne said by the time decisions are made about waste treatment, a risk and performance assessment will be available to determine how well waste can be retrieved. Roger added that DOE-ORP would have to have a closure plan to put grout in a tank.
- Gerry commented that DOE-HQ has formally challenged requirement to close tanks under RCRA, which would mean the state does not have the authority to stipulate

tank closure. Roger said DOE-ORP needs a RCRA permit to close the tanks, which includes adding grout if that is part of the RCRA plan. Steve said the tanks are regulated under RCRA, and DOE-ORP intends to close the tanks under RCRA.

- *What is the status of Appendix H for the C-106 tank?* Roger said it will take several months for the NRC to review and issue its comments. DOE-ORP will revise the Appendix H document to address all the changes resulting from NRC's review and resubmit the document to Ecology.
- *Has DOE-ORP given any further thought to re-entering the C-106 tank to conduct further residual waste removal?* Roger said DOE-ORP has no plans to move forward with additional retrieval in the C-106 tank.
- Dirk expressed concern that DOE-ORP is reading the NAS report too narrowly, since he does not believe it is valid to suggest portions of the review do not apply to Hanford because it focuses on the Savannah River site. He explained that residual waste materials will not mix with grout, so DOE-ORP needs to consider removing residuals to the amount technically practicable. Steve said he agrees it is important to remove as much residual waste as possible, and it has been DOE-ORP's experience that it often requires employing multiple technologies.
- Jeff Luke commented that the TPA requires DOE-ORP to retrieve as much waste as technologically possible. DOE-ORP is required to issue a report that specifies the amount of waste removed, and any technologies that might retrieve more waste. Tank Waste Retrieval Work Plans are submitted before tank waste is retrieved. He commended DOE-ORP for considering the suite of technologies to determine the most appropriate technologies to meet retrieval goals. For example, DOE-ORP was not going to meet the TPA retrieval goals for waste retrieval at the S 112 tank, so they developed their own technology to achieve the retrieval goal.
- The committee discussed focusing on this issue in October. The Board gave advice on bulk vitrification and is still waiting for a response. Considering DOE-ORP's decision-making schedule for this issue, a committee discussion of this topic in October is perfect timing.
- Al commented that the document is purely a project evaluation of the demonstration bulk vitrification project, since it does not include a review of a product performance assessment, no evaluation of systems performance, and no cost information. Rick Raymond said DOE plans to do a separate cost review. Suzanne said part of the confusion results from understanding the purpose of the NAS review. It is a review of the pilot plant, to make sure it is adequate, and is not meant to inform the decision whether to build the primary LAW plant or a second LAW plant.

### **Summary Flow Diagram Model**

Billie Mauss and Jim Honeyman, DOE-ORP, presented the summary flow diagram for systems modeling of the WTP to understand some of the recycles and alternative concepts and designs. Jim discussed the baseline change request directing CHG to address some of the WTP delays, logic changes for retrieval activities, and its deployment of multiple technologies for waste retrieval. DOE-ORP and CHG have identified 50 SSTs for multiple technology deployments. Changes in logic include consideration of a pre-treatment and supplemental treatment facility. These represent ways to begin treating some waste before the WTP comes online. The summary flow diagram also provides improvements in overall logistics.

The diagram is currently being worked and will be documented in the Tank Farm Operation and Utilization Plan, which will be released later in the summer. DOE-ORP is building a more detailed tool for understanding secondary waste storage and challenges regarding the Effluent Treatment Facility (ETF) and IDF, to better understand tank waste volumes, a waste treatment schedule, and limitations on concentration. Developing and refining the flow diagram is an evolving and iterative process as more data is collected. The flow diagram will be updated as DOE makes adjustments and receives information from external cost reviews. The current flow diagram represents the first time DOE-ORP has been able to knit the system together and deal with secondary waste, although life cycle analysis simulations are taking longer.

Billie said the sets of modeling assumptions are verified by DOE-ORP. The flow diagram is being used for current analyses and for long-term performance and baseline schedule and budget development.

### **Regulator Perspectives**

- Suzanne emphasized that no secondary waste treatment decisions have been made. She said she understands the need to analyze options. *She wondered why supplemental waste treatment is separated between the 200 West and 200 East areas?* Because of the WTP delay, Jim said the waste balance on site changes from a timing and mass perspective. DOE-ORP is looking at retrieval and treatment logistics to see if there might be a way to simplify the treatment system downstream.

*Suzanne confirmed that DOE cannot put together a baseline change request until they work with the regulatory agencies to change the TPA.* Jim said that is correct, and that the change request is being used as a budget tool. Steve added that it is a question of whether the milestone drives the baseline or the baseline drives the milestone. He said DOE-ORP hopes to enter into a more mature approach in milestone and baseline development.

### **Committee Discussion**

- Steve explained that the Board issued advice recommending DOE-ORP pursue a systems approach to developing the baseline. He said it is important to have a conversation about the tool being used to modify the baseline, to determine if this is the correct tool to use. Rick Jansons said one of the goals of the Board's systems advice was to prompt DOE-ORP to request funds from Congress to develop a well-defined systems tool.
- *What is the supplemental transuranic waste (TRU) Treatment System?* Jim said DOE-ORP is going through the permitting process with New Mexico. The TRU Treatment System is a packaging system to package waste from T Farm. It consists of a vacuum retrieval system, packaging waste in standard 55 gallon drums, and going through the traditional contact handled TRU waste process.
- *Does DOE-ORP treat all TRU the same?* Jim said Congress defines TRU, which determines DOE-ORP's TRU treatment strategy.
- Todd Martin said the original baseline was to retrieve waste from the tanks. Based on the current schedule, Jim said DOE-ORP will not have waste out of the tanks for several years.
- *Could DOE-ORP build a temporary facility to package waste material?* Jim said DOE-ORP is considering a temporary packaging facility that could move from facility to facility. This is not currently permitted.
- *Considering a ten-year extension for tanks storing waste to accommodate the WTP delay, how will DOE-ORP ensure the adequacy of infrastructure in the meantime, including evaporator and tank farm life?* Jim said specific assumptions are made for each facility. DOE-ORP conducted a substantial infrastructure assessment for the WTP operation. As a result of the delays, DOE-ORP will produce an updated infrastructure plan to determine whether systems are repairable or have to be replaced.
- *When will funding be available to address these complexities?* Jim said funding is through a two-year Congressional earmark. DOE-ORP is building a plan with the contractor, which includes computer and graphic improvements. Billie added that CHG has the budget in its baseline to support the effort.
- Harold commented that the Board's systems advice resulted from an analysis of starting the WTP early. In the past, DOE-ORP indicated there would be one supplemental treatment facility, but the flow diagram includes multiple supplemental treatment facilities. Jim said DOE-ORP previously described an 8-line supplemental system in the East Area. He said it is the same facility, but is just built in a different way. Billie reiterated that no supplemental treatment decisions have been made.
- *Is the model used for the flow diagram capable of doing cost studies?* Jim said the flow diagram provides technical input that feeds into cost estimate. Suzanne said the Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS) will conduct the cost studies.
- *When will the most recent output run be available?* Jim said results of an output run would be available by mid-summer, and it might be possible to have a documented

computer run earlier. Al requested an electronic copy of the output results when they are available.

### **Single Shell Tank Status**

Roger Quintero, DOE-ORP, provided a status update on three SST topics: 1) SST retrievals, 2) DST volume, and 3) SST Performance Assessment.

- 1) Roger provided a list of completed tank retrievals, in-progress retrievals, and retrievals planned for in Fiscal Year 2007 (FY07). The estimated residual waste was listed for each retrieval. Beyond FY07, DOE-ORP plans to retrieve all C Farm tanks, however, DOE-ORP cannot meet the TPA milestone to retrieve all tank waste from C Farm. DOE-ORP needs to meet with Ecology to renegotiate a retrieval schedule. Roger described waste retrieval actions in the C-201 and C-103 tanks. Using DST supernate for sluicing in the C-103 tank conserves DST space and reduces evaporator runs.
- 2) Roger outlined the status of DST waste inventory and capacity. DOE-ORP determined adequate DST space exists to accommodate completion of S-112, S-102, C Farm, and support the Demonstration Bulk Vitrification System.
- 3) Roger updated the committee on the SST Performance Assessment (PA), which is scheduled for release in May of 2006. He noted that the release of the PA was delayed due to concerns that releasing it would pre-judge the content of the TC&WM EIS. DOE-ORP is currently going through deliberations to determine if it is appropriate to release the document. DOE is not pursuing any type of closure decisions. DOE plans to share the PA analyses and results with stakeholders.

Jim discussed pretreatment for the LAW Plant. No tank waste currently meets the WTP Waste Acceptance Criteria of  $< 1.85E-04$  Ci/L at 7M Na. Jim discussed tank treatment and disposal pathways for WTP LAW vitrification. If DOE-ORP could complete the Integrated Low-Activity Waste (ILAW) facility ahead of other facilities at the WTP, some waste feeds could potentially begin; however, the WTP is designed as an integrated whole, so a number of modifications would have to be made to the existing design. There is plenty of medium curie feed in the 200 East Area to provide a waste supply to the ILAW facility for several years. Cost and capacity estimates are being prepared by BNI and DOE, and are expected to be in the range of a few hundred million dollars.

### **Committee Discussion**

- *Are any starts planned for FY08?* Roger said DOE-ORP cannot currently say what is planned for FY08. C-108 tank waste retrieval is fully funded in FY07.
- Suzanne commented that recycling waste back to the DSTs does not create DST space. Jim said that is a worthwhile comment for DOE-ORP to consider. Suzanne said sending material for disposal without being appropriately disposed of is not an adequate answer for Ecology. Jim said DOE-ORP has not worked through the issue yet. Steve said many in DOE-ORP do not believe this is a good idea, since it does not remove waste from the site. Suzanne said Ecology would support a sensible way to

start the facility early, but she emphasized the whole system has to be in balance. DOE-ORP cannot send waste for disposal that creates risk.

- *Considering DST volume, what does the SST backfill portion consist of?* Roger said SST backfill is waste that comes out of SSTs, and includes space consumed as a result of retrieving waste from DSTs.
- *As DOE-ORP retrieves waste from SSTs, will emergency tank volume be reassessed, since there should be less uncertainty?* Jim said DOE orders require a certain amount of emergency tank volume.
- *Has the SST PA looked at all alternatives under NEPA?* Roger said the PA considers one alternative. Dirk expressed concern about the single alternative in PA prejudging the outcome. Jeff Lyon said the PA is necessary because DOE-ORP needs to be able to judge the impacts of a tank leak. The PA does not pre-judge the tank closure decision, but helps consider interim options for soil analysis.
- Dirk cautioned DOE-ORP about using the SST PA to make closure decisions. Moses Jaraysi, CHG, said the PA will not be used as a final decision-making document until the EIS is in place to guide closure decisions. Currently, the only purpose of the PA is to guide the corrective action program. Jeff said Ecology cannot determine the adequacy of the PA until its release. He is encouraged that DOE-ORP is trying to develop the PA in an open, transparent process to help guide some corrective actions.
- *Is the waste retrieval figure based on what waste has already leaked?* Steve said the retrieval figure is based on TPA requirements or retrieving as much waste as technically possible. Dirk commented that it does not make sense for DOE to retrieve 99% of the waste and as much as possible. Moses said people think DOE-ORP has to retrieve 99% of the waste in each tank, but DOE-ORP is actually going to be retrieving 99% of waste across all the tanks. RCRA requires removing as much as practically possible, but DOE-ORP has to have a number that guides retrieval work.
- *When will a legal PA be complete?* Moses said after the TC&WM EIS is complete. Steve said clean closure decisions will be made in the TC&WM EIS. In addition to the TC&WM EIS, Moses added that clean closure will also be evaluated in the closure plans.
- Gerry commented that DOE still plans to send contact-handled TRU to WIPP. *Has DOE-ORP analyzed what it would take to use contact-handled TRU tanks as feed for the LAW vitrification plant?* Jim said that might be possible, but the primary issue is that most are in the 200 West Area. Billie added that more of the waste is sludge and is required to follow the high-level waste treatment path. Suzanne said there are better feed choices for the LAW, such as much of B Farm and BY Farm.
- Rob commented that the Closure End States Workshop stressed addressing risk, which is based on curie content. However, DOE seems to be basing risk on volume. Suzanne said it depends which risk scenario is of concern (e.g., groundwater, air, type of intruder, etc.). Jeff added that high risk tanks are sometimes not in easily accessible areas.

- *In how many SSTs is retrieval complete and what is the timeframe for remainder of the SSTs? Have the remaining SSTs been negotiated in the TPA?* Roger said waste has yet to be removed from 149 SSTs. Moses added that there are TPA milestones to negotiate the remainder of SSTs.

### **Committee Business**

The committee discussed future committee meeting topics:

- Invite ACOE and DNFSB to present their reviews of the WTP EAC. The committee agreed that policy-level advice principles need to be developed.
- Some committee members felt the committee should have more discussion time regarding the WTP EAC. Gerry suggested planning another joint committee meeting in June to discuss the path forward from the policy and technical perspectives. He indicated the committee and the Board need to evaluate and possibly develop advice on DOE-ORP's response to the reviews. The committee agreed to invite GAO, BNI, and DOE to the meeting to serve as resources.

The committee identified topics for further discussion regarding the WTP EAC:

- Evaluate the WTP delay caused by waiting to complete 90% design.
- How is DOE accommodating technology changes?
- What is NRC's role? What is the program planning and budget impacts of working with NRC? How do you obtain public credibility?

Gerry, Dirk, Paige, and Rick will develop a framework for this agenda item.

- Todd said committee issue manager (IM) work needs to be done before the next committee meeting include:
  - Determining the purpose and frame for the committee discussion and presentations.
  - Formulating next steps for the Board regarding the WTP.
- The committee discussed the need to ensure presentations appropriately address committee questions. Harold and Ken Gasper will develop a set of questions for the next committee meeting regarding systems integration and modeling for WTP and the impacts of delays.
- Al said the committee should discuss the topic of total cost estimates. He noted there are three pre-treatment facilities, but the committee has only considered the WTP estimates, while there is several billion dollars of other facilities that need to be addressed. There needs to be a broader scope of total cost estimates.
- Maynard said he would like to see the committee consider advice on the future shortage of available WTP operators.
- Rob and Dirk agreed do be issue managers to track work on weld assessments and what to do about the other 95% of welds not being evaluated.

- Gerry suggested the committee should receive a presentation from John Brodeur on a report of the characterization process at the tank farms. He said this is not time critical for a June meeting. Rick said he would like the regulatory agencies to review and digest the report before the committee discusses this issue.
- Dirk said the committee should discuss the issue of DST life determination criteria. He said this is not time critical for a June meeting. The committee will revisit this item in September after the external review team.
- The committee agreed a joint meeting with BCC in June was necessary. A proposed date of June 22 was made. This will be discussed on next week's Executive Issues Committee call.
- Committee decided a May committee call was unnecessary.

### **Action Items / Commitments**

- Gerry, Dirk, Paige, and Rick will develop a framework for the WTP EAC discussion at the June committee meeting.
- Harold and Ken Gasper will develop a set of committee questions to frame presentations for the next committee meeting.
- Rob and Dirk will track weld assessment issues.

### **Handouts**

*NOTE: Copies of meeting handouts can be obtained through the Hanford Advisory Board Administrator at (509) 942-1906, or [tholm@enviroissues.com](mailto:tholm@enviroissues.com)*

- Waste Treatment Plant: Estimate At Completion External Review Team Report, DOE-ORP, 5/12/2006.
- Statement of James A. Rispoli Assistant Secretary for Environmental Management U.S. Department of Energy before the Subcommittee on Energy and Water Development, and Related Agencies Committee on Appropriations U.S. House of Representatives, 4/6/2006.
- Blind eye to new Hanford High-Level Nuclear Waste tank leaks, "Vit" Plant Safety, \$7 Billion Cost Overrun confirmed by experts: CBS' 60 Minutes Highlights 2 Reports by Heart of America Northwest, Heart of America Northwest, 4/30/2006.
- Supplemental Treatment Projects Status, JE Van Beek and RE Raymond, CHG, 5/12/2006.
- Summary Flow Diagram for BCR Case / TFCOUP Rev 6, CHG, 4/4/2006.
- Tank Treatment & Disposal Pathways – WTP LAW Vitrification, CHG, 5/4/2006.
- Single-Shell Tank Status, Roger Quintero, DOE-ORP, 5/12/2006.
- Tank Waste Retrieval, Processing, and On-site Disposal at Three Department of Energy Sites: Final Report, National Academies, date unknown.

**Attendees**

**HAB Members and Alternates**

Allyn Boldt	Susan Leckband	Maynard Plahuta
Rob Davis	Jeff Luke	Gerry Pollet
Dirk Dunning (phone)	Jerri Main	Wade Riggsbee
Kenneth Gasper	Todd Martin	Dick Smith
Harold Heacock	Bob Parazin	John Stanfill
Rick Jansons	Bob Parks	
Paige Knight	Jerry Peltier	

**Others**

Steve Chalk, DOE-RL	Madeleine Brown, Ecology	Craig Albert, BNI
John Eschenberg, DOE-ORP	Suzanne Dahl, Ecology	Julie Atwood, BNI
Billie Mauss, DOE-ORP	Ed Fredenburg, Ecology	Jim Honeyman, CHG
Erik Olds, DOE-ORP	Jeff Lyon, Ecology	Moses Jaraysi, CHG
Roger Quintero, DOE-ORP		Stewart Mackey, CHG
Steve Wiegman, DOE-ORP		Rick Raymond, CHG
		Cathy McCague, EnviroIssues
		Jason Mulvihill-Kuntz, EnviroIssues
		Sharon Braswell, Nuvotec/ORP
		Tom Petty, GAO
		Jeff Larsen, GAO
		Bill Swick, GAO
		Annette Cary, TCH