

**FINAL MEETING SUMMARY**

**HANFORD ADVISORY BOARD  
TANK WASTE COMMITTEE**

*April 9, 2014  
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.*

**Opening**

Dirk Dunning, Tank Waste Committee (TWC) chair, welcomed the committee and introductions were made. The committee tabled adoption of the March meeting summary until next month, since the draft summary was distributed the week prior and comments were not requested until later in the week. One comment was received to date and a request was made to expand on the Tank Waste Characterization and Staging topic presentation. EnviroIssues will address these requests and look to the commenters for more specific direction as needed.

*Announcements*

Steve Hudson shared that the State of the Hanford Site meetings are upcoming throughout the month of April, with Seattle (April 15, 2014), Portland (April 16, 2014), Hood River (April 17, 2014), and Richland (April 29, 2014), each hosting a gathering. More information concerning the meetings’ scope and purpose can be found at <http://www.hanford.gov/page.cfm/StateoftheHanfordSite>.

The entire TWC thanked the Department of Energy (DOE) for the morning’s tour of EnergySolutions’ full-scale mixing test facility. The committee tentatively agreed that they should look into another visit sometime in early 2015 to see how the facility’s work is evolving.

## **Update on Double-Shell Tank Construction—Extent of Conditions Report**

### *Agency presentation*

Ted Venetz, Department of Energy – Office of River Protection (DOE-ORP), provided the TWC with summarized research findings pertaining to double-shell tanks at the Hanford Site that shared construction and operation similarities to AY-102, the double-shell tank discovered to be leaking into its annulus in August 2012. In order to learn more about potential risks facing other double-shell tanks at the Hanford Site, DOE-ORP conducted this analysis of similar tanks. To execute this work, Ted's team searched through over 1.2 million pages of project documentation including quality assurance inspection logs, status reports, weld inspection records, non-conformance reports, deficiency reports, and photographs. In his presentation, Ted shared the following highlights and takeaways:

- Of the twenty-eight double-shell tanks at the Hanford Site, it is unlikely that there is another that is leaking like AY-102.
- Shared a brief history of the construction timeline of the double-shell tank farms. Initial tank farm construction began in 1968-1970, with two tanks built per year. As time went on, construction became more ambitious, and a greater number of tanks were built each year.
- The process for constructing a double-shell tank occurred in the following (summarized) steps: (1) laying the foundation [slotted for tertiary leak detection], (2) laying liner, (3) placing the castable refractory, constructing the (4) primary tank bottom, (5) primary tank walls, (6) secondary liner walls, (7) primary tank dome and risers, and (8) primary tank stress relief and insulation [propane blowers and burners were introduced at this point to provide controlled stress-relief for welds], (9) conducting a hydrostatic leak test on the primary tank, (10) securing the secondary top knuckle, and (11) backfilling.
- Tanks farms at the Hanford Site were built in six iterations. Three separate contractors were dedicated to individual iterations throughout the construction history.
- Different steels were used in the different tank construction as the years progressed. The reason for this was developing and changing technology that allowed for improved steel production and management (i.e. high quality steel in the 1970s would have been different from high quality steel in the 1990s).
- Different contractors used different strategies for welding and curing the tanks. For example, beginning in SY Farm, electric heaters and insulation were used to keep the tanks warm until they could be fired, and cold-weather cures were avoided. In addition, the different construction iterations were subject to different weather conditions, and temperature and precipitation both contributed to the overall wear that the tanks experienced.
- Most of the problems seen in AY-102 were not repeated in other tank farms, but DOE's analysis demonstrated that each time a new contractor began work, new issues were discovered in the resulting tanks.

- There is intent to produce a summary document from this research, including lessons learned about how to most appropriately build a tank farm and a ranking of tank construction strategies. An expert review of materials, welding practices, post-weld stress relief, primary tank support and installation, and weather protection may also be included.
- The lessons that the analysis provided could guide future use decisions.

#### *Committee Questions and Responses*

*Note: This section reflects individual questions, comments, and agency responses, as well as a synthesis where there were similar questions or comments.*

Q. Why was inferior steel used in the construction of some earlier tank farms?

*R. [DOE-ORP] The steel that was used in earlier construction was not necessarily inferior, later material just has better high temperature strength and performance due to evolving metallurgical technology and understanding. As new tanks were built, and as requirements for tanks changed, construction managers revisited the idea of which steel varieties presented the best fit.*

Q. How were the tanks heated for purposes of curing?

*R. [DOE-ORP] Propane heaters were inserted into the top of tanks. Approximately 10,000-15,000 gallons of propane was required to cure each tank.*

C. Future construction of tanks should take into account these lessons learned. The Hanford Site needs more tanks to be constructed, and time is of the essence. Hopefully this new information can help to guide the quick construction of robust new storage tanks. It needs to be a priority that this information is effectively passed on and incorporated into new tank farm development.

Q. How many tanks are suspect now? Which ones are most worrisome?

*R. [DOE-ORP] The answer to that is subjective, and to answer it effectively you have to not only look at construction history but also operating history. Generally, SY and AY Farm are recognized to be the most similar to tank AY-102.*

*R. [DOE-ORP] The data that was just presented gives us great insights into how the tanks are aging, but until we actually empty AY-102, it is difficult to say exactly where focus on the remaining tanks should be targeted.*

C. A comment on operation history: AY-102 was supposedly subjected to very hot, very acidic waste. The acidic nature of the waste that was returned to the tank may have not been adequately addressed. Undoubtedly, the use of the tank was a major factor in the way that it endured.

Q. For future construction, would it make sense to switch to stainless steel for constructing new tanks?

*R. [DOE-ORP] Unfortunately, stainless steel does not represent a panacea, and it would likely not be the best variety of steel to use for storage tank purposes.*

Q. When you were doing this analysis, did you look outside of Hanford to other industries that utilize this style of tank design?

R. *[DOE-ORP] No, not for the purposes of this analysis. We did incorporate some data from Savannah River, but our primary purpose with this effort was comparison within the Hanford Site.*

Q. How can we ensure that there is a good culture in place, and that engineering constraints and requirements are taken into consideration in the future? As DOE looks forward to continue using these tanks, how can we make sure that we do not have another AY-102?

R. *[DOE-ORP] Our immediate next step is to get a summary of this information up onto the website. As mentioned, we would like to publish a summary report in the future. It is our hope that disseminating these results will positively influence future tank policy.*

Q. Why were construction lessons not effectively passed from one contractor to the next?

R. *There is quite a series of detailed technical reports of the files on double-shelled tank construction that make fascinating reading. Some of them note design flaws and construction flaws, and, as you go through it, you see that contractors had some problems getting the welds to take. In general, the welds were not especially technical or difficult, but the welders were not as skilled as they could have been. There was a very long learning curve for the process.*

R. *There is sometimes a disconnect between engineering and constructing something. Engineers will do their job; then they leave. For the construction process to be most effective, ongoing involvement and feedback, on the behalf on both engineers and workers, is needed.*

R. *This problem may also be cultural, as well. Someone needs to be on site as the work is being done. Not only that, they need to have the ability and the authority to say, "No, that is not done right." Perhaps should look into borrowing some lessons from the Department of Defense (DOD) and move forward with cleanup at the Hanford Site in a more deliberate way with increased, more focused accountability. DOD has a tendency to approach difficult situations by building team accountability and cohesion, and we need to incorporate their ideology into this effort.*

C. This presentation has demonstrated that we need to encourage more experience sharing. We also need to reiterate our HAB Advice #271 that more tank construction is needed.

The committee thanked Ted for his illuminating work and presentation, and they recognized the amount of effort that Ted and his team put into their analysis. Dirk Dunning stated that the TWC should plan to revisit this issue in approximately six months' time, depending on what is learned about AY-102 and other tanks within the coming year. The issue managers will work with DOE on the appropriate timing.

**Review of Responses to HAB Advice #271 Leaking Tanks and HAB Advice #273 Openness and Transparency Related to Tank Waste Treatment**

Dirk opened committee discussion pertaining to DOE-ORP's\* response to HAB Advice #271 and DOE\* and Ecology's\* responses to HAB Advice #273.

*Committee Discussion Regarding HAB Advice #271 Leaking Tanks*

C. This committee worked extensively to get information out about leaking tanks. Looking at Advice Point #8—we state that new tanks are needed. DOE-ORP responded by stating that they are going to maintain existing tank space, and that they are going to have infrastructure available to pump tanks on short notice. However, it does not seem like this infrastructure currently exists, as we are looking ahead to 2016 before AY-102 is going to be pumped. Other Tri-Party Agencies are giving the HAB more support than DOE.

C. While the response from DOR-ORP may not be what we want to hear, I applaud them for working to respond to each advice point. Overall, I thought that it was a good response. We do not have to like what they say, but they made an excellent effort to be reply to our specific questions and statements.

Q. DOE needs to recognize that there are safety and legal issues at play. We need the agency to espouse a robust nuclear safety culture.

C. If we, as a group, are not getting the active responses that we would like to see from agencies, we have the ability to share our advice with other groups to influence change. Just because we are not getting the type of feedback that we want from DOE and others does not mean that something is going wrong with our efforts.

C. As a public policy board, the HAB strives to give our leaders direction, but, unfortunately, we are not seeing much forward movement right now. To find out that we currently do not have a pump that can be used on AY-102 does not indicate agility with the agency. Even if there were a pump, the contents of AY-102 would likely have nowhere to go, and there are recognized problems that stem from moving tank contents around. Our collective goal should be success, and the HAB should not be cut out of the conversation.

C. When we get a bad response to our advice, the HAB has a responsibility to look critically at the advice that we are passing along. Is our advice clean and clear?

*R. Should the HAB be fearful to say what we really feel?*

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\* Please see Attachment 2 – Department of Energy – Office of River Protection response to Hanford Advisory Board September 6, 2013 Consensus Advice #271, “Leaking Tanks”

\* Please see Attachment 3 – Department of Energy response to Hanford Advisory Board Advice #273, “Openness and Transparency Related to Tank Waste Treatment”

\* Please see Attachment 4 – Washington State Department of Ecology response to Hanford Advisory Board Advice #273, “Openness and Transparency Related to Tank Waste Treatment”

*R. Sometimes we overload the advice and, as a consequence, it lacks precision. Also, we do not always ensure that our advice is being sent out to the most applicable audiences. Sometimes, we could stand to get information and advice out to more appropriate groups.*

C. The responses that we are getting are likely the best possible. We are sending a message, we are sending it well, and they know what the public wants. However, we cannot expect to get a wholly positive response all of the time. The HAB serves a very valuable purpose by codifying popular opinion in an official record.

C. The function of this Board is policy advice; one of our overarching policy goals is safe storage for waste until it can be adequately processed. We need to focus on long-term issues and long-term planning. We need to recognize that the tank waste is going to be around for a long time, and work on making a safe-storage plan. Without a plan, we cannot effectively move forward.

C. The double-walled tanks were a gamble that was taken a long time ago, and, unfortunately our time has run out. Moving waste from tank to tank is stressing the tanks more and more; consolidating the waste produces more heat and further stresses the tanks. We need to work to remedy the splintered bureaucracy.

C. To keep things at the policy-level, we need to come up with certain topical areas with two or three main points. Continually writing new advice does not seem to be doing it. How many ideas can we come up with over time? The HAB's advice is much of the same ideas being re-communicated. Advice should work to be concise, as opposed to voluminous. We do not have an easy way to suggest to DOE (or another TPA agency) that they should work to do something differently. The Board has many good ideas as to how to do some things better at a technical level, too. Getting a bureaucracy to change direction in an ongoing program is almost impossible

C. Outside groups really appreciate the advice that the HAB releases. Thank you.

Q. The response from DOE-ORP was written in December—is there anyone from DOE-ORP who can come and talk to us about changes that have occurred over the past three months or tell us if their response would be different if issued now?

*R. DOE-ORP has offered to do so; we can take them up on this. However, their response would likely not be significantly different today than it was back in December 2013. We can add this conversation to the May potential meeting topics.*

#### *Committee Discussion Regarding HAB Advice #273 Openness and Transparency Related to Tank Waste Treatment*

C. Regarding Ecology's response—it was excellently done and I applaud their action of withdrawing from the confidentiality agreement. They seem to want to disclose as much information as possible to the public. However, DOE's response to HAB Advice #273 was not as encouraging, and it read as though it were written entirely by lawyers.

Dirk noted that DOE had offered at the March Board meeting to come to TWC to further discuss HAB Advice #271; Dirk suggested that the committee think about inviting DOE to discuss this advice and any potential updates.

### **Open Forum**

*Dirk described how this Open Forum topic is intended to be a forum for the committee to discuss Hanford related issues and brainstorm future committee topics. He noted that DOE would like to share information about two emerging topics, a proposal to amend the Consent Decree and an update on recent tank farm vapor exposures.*

#### *Proposal by DOE to Amend the Consent Decree\*\**

Ben Harp, DOE-ORP, discussed DOE's proposal recently submitted to the State of Washington to codify desired amendments the Consent Decree (CD). DOE has been meeting with the state to discuss milestones and setbacks to the original CD, and, because of that process, publically released a document outlining proposed amendments to the CD. In the proposal, the DOE focused on near-term milestones, and the proposed amendments incorporated trigger-points for creating future milestones. The agency is committed to the production of glass as well as large-scale vessel testing and corrosion milestones regarding the Waste Treatment and Plant (WTP). DOE now has 60 days to create new milestones; however, at this point they are not entirely sure what those will look like. Currently, milestones for erosion, corrosion, and mission constrain the design of the WTP. Ideally, future work would allow all infrastructure to be put into place before treatment begins. DOE is not backing away from previously set milestones, it is simply working to adapt to technical and funding circumstances. Some of the advice that the HAB has released, most recently HAB Advice #273, regarding transparency, may influence a final decision.

C. [Ecology] A press conference of Washington State's Governor Inslee and Attorney General Ferguson discussing the state's proposed consent decree amendments can be found on TVW.org (direct link: [http://tvw.org/index.php?option=com\\_tvwplayer&eventID=2014030134](http://tvw.org/index.php?option=com_tvwplayer&eventID=2014030134)). It is very informative; committee members should evaluate each of the proposals and then arrive at their own conclusions.

Q. Of the current issues with the WTP, is there a ranking of issues by importance or immediacy?

*R. [DOE – ORP] The mixing will take the longest. Erosion/corrosion is not necessarily a worse problem, and all of the issues are occurring parallel to one another.*

Q. One of the big problems with the WTP is the lack of quality assurance. It seems like the complex was built more like a bridge than a nuclear installation, in that its construction was very schedule-driven. The

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\* Please see Attachment 5 – Summary of the Department of Energy's Proposal to Amend the Consent Decree

\* Please see Attachment 6 – Proposal by the U.S. Department of Energy to the State of Washington to Amend the Consent Decree

Hanford Site was supposed to see a vitrification plant in 1999, but, due to continued delays, we are still waiting fifteen years later. There are obviously systematic and institutionalized problems that are constraining outcome. Why are these safety and operation concerns not addressed in amendments?

R. *[DOR—ORP] The plan that was released last week notes that there is an entire corrective action program going into place. DOE is trying to get the vitrification facility up and running, at least partially, as soon as possible. We are working with what we have, and we do not know the exact form that the redesign is going to take. However, we are committed to redesigning and replacing components as needed, as was done with the ventilation system.*

C. I think that there is enough energy and interest in this topic that we could discuss it further at the May TWC meeting.

#### *Tank Farm Vapors Update*\*

John McDonald, Washington River Protection Solutions (WRPS), briefly discussed the recent worker exposure to tank farm vapors, which are the biggest risk that individuals working in the farms face. Exposure can affect individuals differently, and effects may be brought on or exacerbated by personal health issues. There are layers of defense in place for these workers, and WRPS's approach to dealing with exposure is very conservative. For example, if anyone on-site notices any odors, the farm is immediately evacuated until a thorough analysis can be conducted. WRPS also has very quick medical response procedures in place, in case they are ever needed. John stated that WRPS is currently looking into methods for the control of vapor events in the future with the goal of further reducing exposure to zero. One challenge that the group is facing is competing risks— sometimes the safety measures create hazards in and of themselves. Self-contained breathing air is an example of this, and when the intervention strategy was used in the past, injury rates went up instead of down. Therefore, WRPS is currently working on strategies that will provide the best balance of safety.

Q. Does Ecology have a response?

R. *[Ecology] Not at this time.*

Q. Could activated charcoal be used as a strategy for vapor mitigation?

R. *[WRPS] No, because many of the vapors would not be filtered out by activated charcoal. Even breathing apparatuses are not fully protective of vapors.*

Q. What are the vapors that we are hearing about most recently?

R. *[WRPS] We know what can be found in the tank headspace (ammonia, ethanol, and nitrous oxide are common). The most recent vapor has not been definitively identified yet, but it may have been ammonia coming from a leaking pump head.*

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\* Please see Attachment 7 – Washington River Protection Solutions Tank Farm Vapors Update

Dirk closed the discussion on tank vapors by noting that the Health, Safety, and Environmental Protection (HSEP) committee would like to discuss this topic in more detail during their May meeting (joint topic with TWC). If any committee members have specific questions regarding the topic, they are encouraged to send them to Sharon Braswell, Mission Support Alliance, prior to May 1 for compilation.

### **Committee Business**<sup>\*\*</sup>

#### *May Potential Meeting Topics Table*

The committee completed the preliminary potential May meeting topics table. TWC tentatively identified the following topics for discussion:

- A briefing and a committee discussion on proposed amendments to the Consent Decree by DOE and Ecology.
- A discussion of the AY-102 Pumping Plan.
- Conversation with DOE (tentatively Kevin Smith) concerning leaking tanks and HAB Advice #273.
- A joint briefing with HSEP regarding tank vapors (on HSEP agenda, joint with TWC)
- A joint briefing with the River and Plateau Committee regarding the Waste Encapsulation and Storage Facility (WESF), focusing on the recent Inspector General report, minicapsules, and budget (on RAP agenda, joint with TWC).
- The committee will also have an open forum to discuss Hanford related issues and identify future committee topics of interest.

The committee also updated its 3-Month Work Plan (attached). Bin/follow up items include tracking progress at the full-scale mixing facility and considering advice in general, including a summarization of all advice as a potential follow-on to the HAB Values White Paper and making advice more accessible by topic.

### **Attachments**

Attachment 1: Transcribed Flip Chart Notes for key points/follow up actions recorded during the committee discussion

Attachment 2: U.S. Department of Energy – Office of River Protection response to Hanford Advisory Board September 6, 2013 Consensus Advice #271, “Leaking Tanks”

Attachment 3: U.S. Department of Energy response to Hanford Advisory Board Advice #273, “Openness and Transparency Related to Tank Waste Treatment”

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\* Please see Attachment 1 – Transcribed Flip Chart Notes for key points/follow up actions recorded during the committee discussion.

\* Please see Attachment 8 – Tank Waste Committee 3-Month Work Plan

Attachment 4: Washington State Department of Ecology response to Hanford Advisory Board Advice #273, “Openness and Transparency Related to Tank Waste Treatment”

Attachment 5: Summary of the U.S. Department of Energy’s Proposal to Amend the Consent Decree

Attachment 6: Proposal by the U.S. Department of Energy to the State of Washington to Amend the Consent Decree

Attachment 7: Washington River Protection Solutions Tank Farm Vapors Update

Attachment 8: Tank Waste Committee 3-Month Work Plan

**Attendees**

Board members and alternates

David Bernhard	Theresa Labriola (phone)	Maynard Plahuta
Tom Carpenter	Pam Larsen	Ed Revell
Shelley Cimon	Susan Leckband	Dick Smith
Dirk Dunning	Liz Mattson (phone)	Bob Suyama
Harold Heacock	Kristen McNall	
Steve Hudson	Melanie Myers (phone)	

Others

Ben Harp, DOE-ORP	Dan McDonald, Ecology	Alex Nazarali, CTUIR
Jeremy Johnson, DOE-ORP	Dieter Bohrmann, WRPS	Brett Watson, EnviroIssues
Jim Lynch, DOE-ORP	Kayle Boomer, WRPS	Hillary Johnson, EnviroIssues
Steve Pfaff, DOE-ORP	John McDonald, WRPS	Sharon Braswell, MSA
Ted Venetz, DOE-ORP		
Kim Ballinger, DOE-RL		
Kris Skopek, DOE-RL		