

FINAL MEETING SUMMARY
HANFORD ADVISORY BOARD
TANK WASTE COMMITTEE MEETING
October 6, 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

Dirk Dunning, Oregon Department of Energy and Tank Waste Committee (TWC) chair welcomed everyone to the meeting and led a round of introductions. Dirk reviewed the purpose of the meeting.

The August and September meeting summaries were adopted.

Review of Tank Removal Study

Issue manager review

Vince Panesko, City of Richland, provided a handout and said he will be reporting to the Hanford Advisory Board (HAB or Board) on the C Farm Tank Removal Feasibility Study (Tank Removal Study) in November. Vince said the Tank Removal Study was a Tri-Party Agreement (TPA) milestone and is easily found on the Department of Energy (DOE) Office of River Protections (DOE-ORP) website. Vince spoke to the engineering principles depicted in the

document, specifically the idea of covering an entire tank farm with a dome for ventilation control and building concrete walls below tanks after excavation to prevent soil from falling back in. Both ideas are depicted with diagrams in the document. Vince said the complexity of removing a tank is what drew him to the Tank Removal Study, and he noted that the high radiation in and surrounding the tanks is the key principle to keep in mind. He said DOE would first have to remove the pipes above the tanks and then the tanks themselves. Residual contamination beneath the tanks may have to be grouted over to reduce the radiation levels before removal. Vince said the waste removed from between the tanks will eventually have to be sent to the Environmental Restoration and Disposal Facility (ERDF), but the Tank Removal Study did not define criteria for shipping to ERDF or where the money will come from to wash the contamination before it is sent to ERDF, which will be a requirement due to high contamination. Vince noted that the estimated cost to remove the tanks is \$800 million, which does not include the washing costs.

Vince spoke to the schedule outlined in the Tank Removal Study, noting that it seems DOE has agreed to milestones that allow the tanks to stay in place, rather than be removed. He said it seems a decision has already been made even though the Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS) has not yet been released. Vince said the Tank Removal Study was a milestone but it may have been a waste of time if the decision has already been made.

Vince said the removal system depicted in the Tank Removal Study does not result in clean closure, noting that 59,000 curies of cesium below the groundwater may be left in the soil. Vince says it does not make sense to spend a large amount of money to only remove what amounts to 30 percent of soil contamination. Vince said the document focuses primarily on cesium contamination, while he would like to see it address a larger inventory of contamination in C Farm, particularly contaminants with long half lives. Vince would like to see the inventory from C Farm compared to contaminants in the whole East Area. He noted that there are overall issues with which contaminants are left in the ground and which are removed.

Agency perspective

Chris Kemp, DOE-ORP, spoke to the milestones associated with tank farms, noting that the TC&WM EIS is the result of poor modeling errors in previous EISs, and it has taken some time to complete. The TPA agencies completed a demonstration closure plan for four 53-gallon tanks in the 200 Area, but the plan was overcome by the agencies inability to negotiate on speeding up tank retrieval. The Washington State Department of Ecology (Ecology), subsequently took DOE to court, which resulted in a Consent Decree on October 23, 2010. Chris said the Consent Decree provides for additional milestones to the TPA milestones, which now work together in one large package. Chris provided a handout that depicts milestones associated with tank farm retrieval and reviewed the documents' processes and timeframes. He noted that the tank closure plan due for TPA Milestone 45-82 (M-45-82) will be submitted to Ecology by the end of October; the document will then be reviewed by Ecology, and DOE will have 30 days to respond to the comments. The two agencies will then work together to resolve any issues.

Regulator perspective

Jeff Lyon, Ecology, said Vince did a great job presenting issues Ecology has also been concerned with on the Tank Removal Study. He suggested TWC revisit issues with the Tank Removal Study after the TC&WM EIS has been released, as the EIS contains relevant information on curie loads and other issues. He said the purpose of the Tank Removal Study was to look at the big picture for C Farm. He acknowledged that assumptions are made for schedules, but no decisions have been made. He said the assumption is that the agencies probably won't remove all contamination from C Farm, but the agencies are required to follow the decision process, which involves public involvement. He said the milestone for closure is important, because it requires the agencies to demonstrate how a decision will be made and the result of the decision. Jeff noted that the TC&WM EIS will help the agencies understand when to make the closure decision and impacts of doing so too early or too late. He said Ecology helped DOE design the study, and they were consulted with and resolved comments quickly. Jeff said he believes the Tank Removal Study is a good document for discussion. Jeff said that in comparing retrieval between Waste Management Area (WMA) C and WMA A, WMA A has more residual contamination than WMA C does, and removing to the same level in both areas may be a concern.

Committee discussion

- Jeff Luke, Non-Union/Non-Management Employees, asked if the definition of retrieval completion is 360 cubic feet below the tanks. Jeff Lyon said that is the standard assumption and how he is making the comparison to WMA A. Jeff Lyon said he would like to present on closure decisions and soil decisions at a later date. He said there is 120 million gallons of waste in all single shell tanks (SST), but the Tank Removal Study only addresses waste in C Farm. Dirk said the Tank Removal Study will be extended for other farms with modifications.
- Dirk asked if the regulators would like to see Vince's tutorial expanded for additional information before it is taken to the Board. Chris said DOE-ORP can work on a table to identify contaminants in the C Farm versus the East Area for comparison and provide it to TWC. Chris noted that the overflows, pipeline breaks, and spills in all SSTs are dwarfed by what is in the BC Area cribs. Ecology and the U.S. Environmental Protection Agency (EPA) did not provide any additions.
- Shelley Cimon, Public-at-Large, said a visual representation is needed to understand assumptions made and costs.
- Susan Leckband, Washington League of Women Voters and HAB chair, said she would like to see the contaminant table include all long lived nuclides like cesium, in addition to technetium and iodine. She said all contaminants harmful to humans should be included. Chris said that iodine and technetium are risk drivers, and he understands what Susan is asking for. Susan said it also needs to be explained that all removable liquids have been pumped out of the tanks but waste remains.

- Harold Heacock, TRIDEC, asked if there is a document available that shows actions with tradeoffs and risks, like an overall decision document. Jeff Lyons said the TC&WM EIS contains additional scenarios and data of that sort, including a clean closure option. Dirk asked if there is a document that describes high level decisions in a summary fashion. Jeff Lyons said the summary of the TC&WM EIS makes the best effort so far, but isn't complete, even though it meets regulations and its purpose. Jeff said another summary would have to be created to address Dirk's question, but it would take some time.
- Dave Rowland, Yakama Nation, said the Tank Removal Study does not seem to be a feasibility study, as it doesn't analyze tank decomposition, soil flushing, or disposal on or off site. He said it doesn't provide much information. He said the removal methods analyzed are conventional, and there are other methods available. He said the study is not a good document to base decisions on, but that it convinced him the waste can be removed safely. He said the document makes it appear that workers will be overexposed if the waste is removed, which he doesn't believe is the case. Jeff Lyon said there are limits for the workers who accept the exposure risk, and they are exposed every time they do work on the tanks.
- Pam Larson, City of Richland, asked when the next iteration of the TC&WM EIS will be released. Jeff Lyons said the document is on schedule to be released at the end of the 2011 calendar year. Pam asked if Jeff is encouraged by what is in the next iteration. He said he is and that the information is much clearer now. He said this next iteration will be released in final form, and the TWC might want to request an agency presentation on it after release.
- Liz Mattson, Hanford Challenge, said Vince's presentation style is accessible for the public and the Board, but everyone gets lost when it comes to the decision document timeframe and assumptions made. She said there isn't a document that captures the assumptions that lead to decisions, or when public involvement has an opportunity to influence decisions and schedules. She asked if it is too late to affect the decision being made on the tank farms. Jeff Lyons said it will be too late if the TWC does not review the relevant documents now because the agencies have to make assumptions in order to move to the next steps of the process. He said the list of milestone documents that Chris provided will help inform the committee on what they should be reviewing, including the closure plan for C Farm and the permit, which will both be available in a few months. He said the permit requires a public process, and he would like the Board to be well informed before it goes out. The TPA agencies' vision for closure of tank farms will be out in the 2014/2015 timeframe, and while it will not address specific decisions, it will demonstrate how the agencies will make decisions on all other tank farms. Jeff said that document will have a 90 day public comment period. Closure plans will be issued once comments are incorporated. Liz said the Board has said time and again that they prefer clean closure, but are now stuck in a process of not being able to say anything until it's too late. Liz said knowing it might be too late already makes her feel hopeless, and the agencies are not well representing the urgency. Vince noted that links to relevant

documents on the DOE website are not clearly identified. He asked when the public will get to see the upcoming closure plan. Chris said the TWC is seeing the documents in their regulator review form, and he noted that the draft SST permit, which is the closure permit from Ecology, will be available for public review in a few months. He said the formal process for tank closure will coincide with the release of the closure plan in 2014, but the agencies are coming to the committee now. Dave asked if the closure plan is the record of decision (ROD). Chris said the SST permit will be the authorization, and the ROD is authorization under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

- Jeff Luke said he would like to make it clear to TWC that though DOE will hire additional workers to mitigate the exposure the workers will incur, the actual first step is to permit the workers with special dispensation for increasing one's annual dose. Jeff said he warned the Board a year ago that DOE will consider closure with the tanks in place, but they didn't wish to say anything then. Maynard said it is important for the TWC to address closure issues now instead of waiting for a public process. He said advice needs to be formalized earlier in the process because it is often too late to impact decisions.
- Dick Smith, City of Kennewick, said the issue seems to be take out all of the tanks or leave them all in, when in actuality there may be a middle ground to leave some in and take some out. He said the TC&WM EIS should speak to the mix and match. Jeff Luke noted that the reference data should be the same between the Tank Removal Study and the TC&WM EIS. Jeff Lyon said the Performance Assessment (PA) will evaluate risk with assumptions and then the agencies will make decisions about whether to spot removal, remove one tank, or remove all tanks. He noted that the tanks are close together and it may be hard to remove only one, but it will be addressed in the closure documents.
- Vince asked if it is a waste of his time to provide a presentation on the Tank Removal Study if the actual plan is to fill the tanks in with grout. Chris said it will be important to consider all of the elements for the presentation, including magnitude of the waste and where it will be sent, which is something people don't often realize. He reiterated that a decision has not yet been made, and the assumptions are purely scheduling tools. Vince asked how the public needs to view the document. Chris said the study is intended to help make an informed decision on tank waste removal, and the public, stakeholders, the Board, and the agencies will be able to provide input on the decisions.

Review of Tank Closure Documents

Issue manager review

Dirk said the committee is in agreement that they would like a presentation on how the closure processes work together. The presentation or tutorial would need to focus on how Appendix H, Appendix I, the System Plan, the 2011 Hanford Lifecycle Scope, Schedule and Cost Report

(Lifecycle Report), and other documents fit together. Dirk noted that work on the PA has been suspended due to budget issues.

Vince said there are currently five closure documents that have received responses from Ecology, and Chris did a good job of explaining the process. He said Ecology's key comment on the C-301 catch tank waste retrieval document was that there isn't enough data available yet because DOE hadn't conducted sampling. Vince said the agencies are working on the issue of digging up the catch tank without knowing what's in it. Vince said Ecology's key comments on the Tank Removal Study concerned waste acceptance into ERDF, acceptance criteria, and a lack of cost for capping and washing, among other comments. Vince said the key comment on the pipeline feasibility study was that there is too much uncertainty concerning many segments of the pipeline. He said the 230 segments of pipeline have been flushed and are somewhat clean, but a significant amount of contamination remains near pipeline plugs. Vince said speaking with Ecology about the overall significant differences between what is in the pipes and what is in the tanks at C Farm, compared to other farms has been helpful. Vince said he did not find the document on integration of CERCLA and Resource Conservation and Recovery Act of 1976 (RCRA) as understandable as the other documents.

Agency perspective

Chris said it is obvious that the agencies need to report to TWC every month on the status of closure documents. Chris said DOE-ORP will need \$521 million in the upcoming fiscal year in order to remain Consent Decree and TPA compliant, but are currently operating at the continuing resolution budget of \$396 million. He said that if they were to split the difference between the proposed U.S. Senate and U.S. Congress budgets of \$467 and \$408 million, respectively, the balance of \$445 million would still not be enough to meet all TPA milestones. Chris said that \$445 million, however, will enable DOE to remain Consent Decree compliant, including C Farm waste retrieval. Chris said the decision to suspend the PA was difficult, and it has impacted staff due to layoffs. He said many people have spent a lot of time on the PA, and he hopes it gets picked up again soon. He said the purpose of the PA is to help DOE complete risk evaluations under criteria for the Consent Decree and TPA M-45-82.

Regulator perspective

Jeff Lyon said the pipeline feasibility study is still underway in the review process, and the RCRA/CERCLA document has an unclear process and doesn't go well on a good day. Jeff said Ecology is working on it in unison with DOE and attorneys in order to agree on language. He said that if the document stays on schedule, decision makers will soon have to determine how to approach soil issues, which is the integration with other documents. Jeff said it may not be worthwhile for TWC to try to understand the document at this point because it may change.

Committee discussion

- Pam asked to confirm that the PA is on hold, but the staff to work on it has been dismissed and won't be available if the PA restarts. Chris said that the ability to restart has been affected, but contractors have been able to temporarily reassign critical staff.
- Liz asked how the suspension of the PA will affect other documents and the closure process. Chris referred Liz to pages 7 and 37 of the Consent Decree, which is available on the DOE website, to see the detailed elements of what has to be done for certification as tank retrieval finishes. He said the PA also impacts waste determination and retrieval. Liz asked which mechanisms make the decisions for removing only some tanks. Chris said landfill closure doesn't just mean grout and cap, and it could mean partial removal of tanks or pipelines, or spot soil cleanup, or removal of all tanks. He said landfill closure can mean many different things, and DOE will have to gain risk reduction whether they do a clean closure or a landfill closure.
- Rebecca Holland, Hanford Atomic Metal Trades Council (HAMTC), asked how DOE and the contractors plan to get any work done with the significant layoffs on site, noting that her work group was recently reduced from 65 workers to 32 and will soon be reduced further to 19. She said she has been told there isn't any work to do, such as sampling they were preparing for that has now been cancelled. Rebecca asked where workers can go to look at their work scope and schedule. Chris said he doesn't have a specific answer other than Washington River Protection Solutions (WRPS) recently had their work scope approved, and Chris can provide it to Rebecca if necessary. Chris apologized for the unfortunate layoffs on site. Susan asked how much damage the continuing resolution has caused to the work scope. She asked if DOE-ORP is operating at a minimum safe, and if so, what it is. Chris said the continuing resolution is the minimum safe for the site. Joni Norton, DOE-ORP, said DOE-ORP is operating at \$396 million, which was the base funding for Fiscal Year (FY) 2011, but the site operated at a higher budget because of American Recovery and Reinvestment Act (ARRA) funding. She said it is a common misconception that DOE-ORP has recently operated at such a low funding level. Joni said DOE-ORP is a ramp up project and will need additional funding in the years to come, whereas DOE-Richland Operations Office (DOE-RL) is a close down project, meaning that as they complete cleanup on the River Corridor, they can safely operate Central Plateau at a minimum safe. She said that in order to remain Consent Decree compliant, DOE-ORP is suspending tank closure work, which is covered under the TPA, but is continuing with retrieval work, which is under the Consent Decree. Joni said work on the C Farm tanks 107, 108, 109, and 110 will continue in FY2012. She said it is hard to determine impacts to the closure date of 2019 from this point in time. Joni noted that some union employees have been transferred between the Central Plateau and Tank Farms because they have similar skill sets.
- Liz said it is common practice for DOE to wait until the last minute to adjust milestones, like closure in 2019. She said there will be a significant impact on tank closure because the PA has been suspended. Joni said impacts will depend on how long the delay is, and there are other means to catch up the work at a later date, like hiring more workers. She

said there are many things that play into a schedule being successful but there are currently too many outside factors for making a decision to adjust the milestone.

- Vince asked when DOE will update their website with Ecology's comments on the Tank Removal Study. Chris responded at the end of the month when the final draft is issued. Vince asked if DOE revised the study to make waste acceptance criteria clearer. Chris said acceptance criteria is not within the scope of the document; he doesn't know if they will address it in a revision. Vince asked how DOE is addressing additional Ecology concerns about soil washing, capping, and catch tank sampling. Chris said there isn't additional information on soil washing included because no better data sets exist. He said the final version does include a cost adjustment for capping the tanks, and sampling work on the catch tanks has been deferred because of the budget. Vince said Ecology has expressed an interest in wanting to know how to make the clean closure versus landfill closure decision through the RCRA/CERCLA document. Chris said that information will be in the closure plan in 2014.
- Shelley said she doesn't want to see the budget to cause protocols reduced to a point where worker and environmental safety is at risk. She asked if less sampling is being conducted because of the budget. Chris said the same worker protocols are in place. Shelley also said she does not want to see the design quality of the Waste Treatment Plant (WTP) suffer because there is currently a lack of funding and DOE may be looking for cheaper options.
- Dirk referenced Figure 3.3 of the Lifecycle Report that demonstrates the projected budget needs for DOE for the next 60 years. He said the site has been operating at approximately \$2 billion per year, but the projection for the next 30 years is far beyond that. He asked how realistic the funding numbers are given the likely budget issues in the years to come. He asked what happens when activities and the items they are linked to get moved out. Dirk noted that for eight years of the timeframe, DOE-ORP's budget alone is over \$2 billion, meaning there won't be any budget for DOE-RL, which is not likely to happen.
- The committee discussed next steps on the closure documents, agreeing to a presentation on the final TC&WM EIS in early 2012. They noted that visuals for assumptions and timelines would be helpful for Vince's presentation to the Board on the Tank Removal Study. The committee may provide future advice on continuation of the PA.

Waste Treatment Plant Safety Culture (joint topic with the Health, Safety, and Environmental Protection Committee)

Issue manager introduction

Dirk said the committee discussed this issue during the September meeting and decided to draft advice, the first draft of which the committee will review after the discussion.

Agency presentation – Pulse Jet Mixers

Delmar Noyes, DOE-ORP, said he will be addressing the issues raised by the Defense Nuclear Facilities Safety Board (DNFSB) as well as technical aspects for the pulse jet mixers in the WTP.

Delmar said he is communicating with DOE-EM management and the Secretary of Energy on WTP issues. He said the successful operation of WTP relies on the ability to mix the waste, and the mixers are the primary method for moving waste in the tanks. Delmar said there are approximately 275 vessels in WTP with a large portion in the Pretreatment Facility (PT); of that, there are 38 vessels that use pulse jet mixers. Delmar described how pulse jet mixers function. They suck waste into the vessels and spray liquid out of nozzles that causes the mixing action. He said the mixers work this way because they are in the black cells, while the moving parts are in the hot cells with a crane in order to be replaceable.

Delmar said that in 2006, an expert review team identified many potential issues with the pulse jet mixers, including issues with mixing, design, and operating times due to large particles and ineffective testing at that point in time. He said that since the review, DOE has worked to increase their knowledge of the mixers. Delmar said 33 of the 38 mixers are operating soundly, but the 5 vessels meant for the non-Newtonian tanks, are proving more difficult. He said the high level waste (HLW) meant to be mixed in the 5 vessels has a high concentration level, much like peanut butter, and DOE is concerned about the ability to mix. Delmar said there is a possibility that heavy solids in the tanks will settle and collect at the bottom of the mixers. He said this information is based on testing from 2008.

Delmar said DOE plans to conduct three phase testing on the five non-Newtonian vessels before completing the design. He said they recognize that the five vessels come with a high level of uncertainty, but they are confident the other 33 vessels will work as intended for a majority of the waste that comes to WTP. He said they are working to resolve issues with the five vessels and are currently developing test programs. He noted that additional mixers have been added to three vessels.

Delmar said other DOE-EM sites and laboratories have been working with Hanford in order to demonstrate that the vessels will meet regulations and safety concerns. He said they will be moving forward with large scale mixing tests that focus on the five non-Newtonian vessels, and he believes that the worst case scenario will be that the designs are off base and the internal parts of the mixers will have to be replaced. Delmar spoke to concerns about the vessel heads being welded to the top of the five vessels, but noted that minor changes can be made with the vessel heads on. He said waiting to weld the vessel heads would have cost too much money, and it may be cheaper to start over on the vessels than what it would cost to impact the schedule with vendors.

Regulator perspective

Dan McDonald, Ecology, said issues with the mixers are not only due to particle size, but also constituent mix and density. He said there is a delicate mix of things that will ensure an optimum throughput in and out of WTP in an appropriate timeframe. Dan said Ecology will be looking for DOE's technical justification and verification scaled in all testing, noting that Ecology will want to participate in the engineering review for the permitting process. He said that they will want to make sure the assumptions used are appropriate, and if not, the assumptions and schedule may have to be adjusted. Dan said the mixers will need a consistent fix in order to deal with the various constituent mixes that will go through the vessels. He said DOE will need to look at what the waste blending needs will be, and he hopes everything will be solved with testing.

Committee discussion

- Dirk said Newtonian fluids behave how one would expect with water, while non-Newtonian fluids behave oddly in several ways. He said it is a lot like ketchup stuck in a bottle that doesn't release but suddenly flows out all at once. He said the response to stress is different. Delmar said DOE has been able to make many changes to the non-Newtonian vessels, including increasing velocity, additional mixers, adjusted nozzles to spray at an angle rather than straight down, and lowered structure lines and heel capacity, but there are still many technical challenges.
- Keith asked if the pulse jet works from pressure. Delmar said there is a vacuum on top of the mixers to suck liquid in, and then air pressure will be applied to force the liquid back out, which causes the mixing. Dirk asked what happens if the air leaves the mixers. Delmar said a release of air could damage the tanks and the ventilation system, so they will try to prevent that. He said an air release is referred to as an over-blow. He said the tanks will be cleaned after they are emptied as an extra precaution against accumulation. Liz asked how DOE will check for accumulation. Delmar said they will conduct a visual inspection and heel removal via a design concept of inserting a camera in the vessels to see if solids are collecting. He said they have the ability to flush accumulated solids out of the vessels but they will have to prove in testing that it will work over a 40 year lifecycle.
- Keith said he has heard speculation that the durability of the jets themselves is questionable. Delmar said some tests have shown eroded vessels, but the testing used erosive material that is not the same as what will actually go into the vessels, even though it was the same consistency. Delmar said high-strength alloy liners have been added to the nozzles to prevent erosion. Dick said a large rotary core drill might help avoid additional abrasives. Dan said DOE was required to allow three of the tanks to be opened with garnet for alternative analysis. He said he is not aware of other alternatives at this point. Delmar said they are working on additional technologies because they understand that garnet is not a long term solution, and there is no reason to put additional abrasive material into the waste feed. Dick said he has previously suggested a design for a rotary drill that might work. Delmar said he will check with the technology department but he believes they may already be testing it.

- Liz asked if the vendors designing the vessels are currently adapting their designs. Delmar said they are making adjustments to the Newtonian vessels based on changes that have been identified. He said some of the vessels are already in the Vitrification Plant (VIT), and the vendors are making changes from there. The VIT vessels will have to be recertified and will go through the permitting process.
- George Klinger, Confederate Tribes of the Umatilla Indian Reservation, asked if the vessels are being adapted to operate for ultra rich dense micron size particles of plutonium. Delmar said studies have identified the potential for plutonium particles that are bigger than what has been assumed in the tank farms. He said the design is based on a 10 micron oxide type particle but DOE is working to identify and measure other possible particle sizes in order to treat all wastes. Delmar noted that some particles may be outside of the size limits of 350 microns and may have to be dealt with in another way. Dick suggested DOE might have to consider a device to minimize particle size. Delmar said the device could be as simple as measuring what comes into the vessels to confirm that it's less than what is thought. He said they just need to inspect more. He said it is also important to make sure the vessels are empty between waste batches. Delmar noted that testing on the vessels will cost between \$30 and \$40 million and will be conducted in the new facility. Jeff Luke asked what Delmar views as an empty vessel. Delmar said they will just need to prove that the vessels won't collect material that will build up over time. Jeff noted that it is conceptually impossible for a vessel to be completely empty, and DOE should look for a percentage.
- Keith asked how many glass logs will be produced from the waste batches created by the vessels. Delmar said he will have to find that answer for Keith, but he knows two glass logs of HLW are created a day.
- Dick asked about the capability to inspect the tanks in the black cells and whether DOE will install further access openings in order to inspect without having to tear the plant down. Delmar said the conceptual design is to install piping that would allow the insertion of a camera into a vessel. Additional piping would also be installed in order to use a liquid to flush out the vessels and delete the heel, but the piping needs to be proven through testing. Rebecca said the cameras being used in the tanks blur up or the lens turns black. She asked if the cameras for the vessels will be replaceable. Delmar said the camera will only be inserted during inspections and will then be pulled back out. He said the access pipe will be for reusable cameras.
- Liz said the idea that the vessels and associated pieces will have to operate on their own for 40 years is not brought up very much, and it will be difficult to test and prove that something will work for one year, let alone 40 years. She asked why vendor changes are being made before large scale testing is completed. Delmar said the 40 year factor is what makes everything more difficult. Delmar said there was a hold point in the fabrication of the vessels until the small scale testing proved that changes may be made even after a vessel head is welded on. He said the mixers are attached to a type of chandelier that can

be worked on whether or not the vessels are open. He said not doing anything would have caused a year delay in schedule and a two to four million cost impact. Keith asked if replacing the chandelier would mean replacing the whole vessel. Delmar confirmed that it would, and the vessels cost \$8 million. Delmar said that if the vessels have to be completely replaced the vessel head will not be relevant. Liz asked if welding the heads on the vessels means they will be moved out of the vendor's shop. Delmar said the five non-Newtonian vessels are currently still in the vendor's shop in Oregon, and the welding had to take place before the vendor could move on to fabricating the next Newtonian vessel. He said DOE and the contractors believe it is a low probability that the vessels will have to be completely replaced, so they went ahead with the welding.

- Rebecca asked if the study on plutonium is available to read and asked if the study returned any surprises, like plutonium in tanks DOE hadn't already identified. Delmar said the study is currently being finished and identifies the probability of plutonium from the Plutonium Finishing Plant (PFP) that has a particle size larger than 10 microns. He said tank farms and WTP has assumed that 10 microns would be the largest plutonium particle based on historical records and sampling. Rebecca said she would like to know what more plutonium will mean to Hanford and workers. Delmar said the tank farms have put a control in place to prevent tanks that have the potential for more plutonium from being moved because the issue will be in transportation. He said the tanks won't be moved until they know more.
- Tom Carpenter, Hanford Challenge, said there has been an issue with underestimating the amount of aluminum in the tanks as well as plutonium. He asked if there is a program in place to deal with excess of other contaminants ahead of time. Delmar said there is a process in place. Tom asked for clarification on the testing that was done that caused mixer erosion. Delmar said the test was meant to mimic the physical characteristics of the material that will go through the vessels, but it was not intended to represent the real erosion characteristics of the real waste. He said the erosion results were consistent with the expectations of the test material. He said the magnitude of the erosion is worse than what is in the tank farms but it was not the worst case scenario material. Jeff Luke asked why DOE would not test worst case material. Delmar said the testing was meant to test material accumulation in the tanks and is consistent with what they predicted. He said cleaning out the tanks between batches will be tested in large scale testing, but they have already added a cleanout capability to 10 tanks as a backup system for mixing. Tom asked if constantly having to clean out the tanks would affect throughput. Delmar said it would.
- Larry Lockrem, Benton County, referenced testing at the 222-S Laboratory 2 years ago that looked at particle size and plugging issues. He said he thought the conclusion was that there is plutonium in the tank waste, though he doesn't remember the particle size that was found. Delmar said there is plutonium metal in the tanks, or at least that's the assumption. He said DOE is currently analyzing the potential that at least some of the particles are bigger than what was previously thought. He said they have collected data

on the range of particles to be expected, and plugging issues have been resolved technically. Larry said the testing was based on a stimulant rather than actual tank waste, and there may be a problem when using actual waste. The committee further discussed past and current sampling methods and the necessity to understand particle sizes before moving the waste to WTP. Delmar concluded that the sampling techniques DOE requires to conduct further testing are in place. Dirk suggested the committee form an issue manager group to further address the more specific technical questions relating to sampling and pulse jet mixers.

Agency presentation – DNFSB

Delmar said the DNFSB raised safety culture concerns specific to the WTP. He said the WTP project tries to exemplify a strong nuclear safety quality in the basis of all work and takes all safety concerns very seriously. He said there are concerns that safety isn't consistent on a project this big, but they recognize the need to continually improve safety and address all concerns. Delmar said there are inherent tensions when transitioning from design and construction into facility startup, and that is the fundamental focus of the DNFSB's concerns.

Delmar said there are many new programs on site to ensure that there is an organized and safe culture that makes safety an overriding priority. He said the nuclear industry knows safety is more important than processes, and worker involvement and quality leadership is key. He said there needs to be an environment where workers have a questioning attitude and feel comfortable asking those questions. Delmar said actions for the WTP contractor, Bechtel National (Bechtel), include implementing and reinvigorating the nuclear safety quality process through training of 1,700 staff (engineering and office staff), monitoring for feedback from employees, and tracking improvements. Delmar noted that the DNFSB's concerns related mostly to the engineering and nuclear safety employees, rather than construction workers. Delmar said there are many other stressors for workers on site, including the environmental funding profile and layoffs; DOE is doing their best to mitigate those stressors. Delmar said DOE across the site and across the agency are invested in improving nuclear safety. He said DOE is also conducting project reviews and safety conscious workforce training.

Delmar said that following DOE's response to the DNFSB concerns, the DNFSB responded and said that DOE has not fully recognized the Board's concerns; DOE now has 45 more days to respond. Delmar said DOE will need to clarify their views on safety culture and the safety report being conducted by DOE-Health, Safety, and Security (DOE-HSS). He said DOE needs to improve communications on safety, and a team is presently developing a Corrective Action Plan (CAP) for the DNFSB's concerns.

Regulator perspective

Dan said Ecology expects them, DOE, and the contractors to engage in the safest behaviors possible, and they expect the proper controls to be in place to protect workers. Dan said that in regards to process safety, Ecology has the expectation that DOE and the contractors will conduct engineering, testing, and decision making appropriately in order to have a safe environment

where processes run smoothly. He said maximizing processes will provide more safety. Dan said Ecology is a venue for people with safety concerns, and they will listen, ask questions, and follow up with the issue. Dan said safety sometimes comes down to merely a difference of opinion, but opinions are addressed in an appropriate way if processes are followed correctly. Dan said that absolute safety may never be accomplished but Hanford will never stop trying to get there.

Committee discussion

- Larry said he sees the WTP as a processing plant rather than a nuclear plant. He said the WTP costs a lot because of the regulations placed on it because it's considered a nuclear plant. He asked why a better approach isn't taken in order to reduce costs and expedite the process. Delmar said his job is to build the plant to meet the mission of the regulations presented by the regulators, the public, and the U.S. Congress. He said the mission was created by federal law and DOE order with some influence from the DNFSB.
- Keith said he would like the committee's advice on DNFSB issues to address safety improvements equally for union and non-union employees. He spoke to training efforts for union employees that have been exemplary, and he would like to see the trainings expanded to include non-union employees. He said workers should be encouraged to raise concerns, and even if they are wrong, they need to be thanked for raising a concern.
- Rebecca asked about DOE's response to the DNFSB about combining employee concerns programs. Delmar said there have been questions about the programs' effectiveness. He said the employee concerns lead works under DOE-RL, even though DOE-ORP used to have their own representative. He said the DOE-RL lead needs to understand the DOE-ORP side issues. Rebecca said she read another letter to the DNFSB about the new WRPS Conduct of Operations Council (Council) and how they are having problems getting bargaining unit representatives on the Council. Rebecca said she has never even heard about the Council. Pamela said she will take that question back to DOE-ORP.
- Liz said she is concerned about Integrated Safety Management (ISM) being the foundation for moving forward with safety culture, as processes and programs do not address culture. Liz said that safety culture is about implementation and on the ground work; ISM is just a process. Delmar said he agrees with Liz, and that programs are needed to cause culture, but they do not result in culture. He said that DOE still needs to foster appropriate attitudes in addition to root cause analysis, CAPs, and safety tools. He said DOE needs feedback and needs to understand it is okay not to agree on everything. He said they hope to improve communications and relationships with the workforce in order to gain the same understanding of safety culture. Liz said DOE focuses on dissenters, while the problem is in the suppression and suppressors. Delmar said the safety conscious workforce training is to increase the sensitivity of the people responding

to issues. He said there are a small number of supervisors that are not accepting issues or not responding appropriately, and DOE is dealing with that. George said he thinks the motivation to quell dissent is built into the contracts. Delmar said quality, schedule, cost, and safety are not independent factors, but have to work together to complete projects.

- Tom said the DNFSB findings report a subculture at WTP that isn't safe, and people who question the culture are not considered team players and are dealt with harshly. Tom said DOE responded that they do not agree with the findings. Tom asked if DOE believes there is an issue and if they are sincere about addressing an issue they don't think they have. Delmar said DOE recognizes the need to continually improve. He said whether or not the culture is broken is not as important as what they are trying to do to improve it. He said the need to improve nuclear safety given current stressors is important and DOE agrees with that. Tom said it appears that Bechtel handpicked their independent review team and will be given an advanced copy of the report in order to comment on it. Tom asked why it has happened that way rather than be completely independent. Delmar said the team was convened to help Bechtel evaluate and understand what can be done for safety improvement, and it is not intended to be independent. He said DOE is also conducting an independent review of the project through DOE-HSS. Tom said the DNFSB criticized DOE-HSS for not successfully completing their first review. Delmar said the criticism of DOE-HSS was for not fully recognizing the results of the review. Tom said there has been a lot of prior review by DOE that showed there are culture problems, but they pick a team to say that it's okay. He said the safety culture issues are still not receiving appropriate attention, despite the DNFSB's strict warnings.

Advice development

- Dirk reviewed the draft advice created by members of TWC, asking if the committee would like to proceed with advice and if the draft captures some of their concerns. Keith said he would like to see the advice go forward with his additional points on training for non-union employees and rewarding questioning attitudes.
- Rebecca suggested adding an advice point that addresses safety for WRPS and the tank farms in addition to WTP. Liz noted that DNFSB recommended DOE look at safety culture beyond WTP, so looking at tank farms fits with the advice.
- Sam said he would like to see the advice move forward, though he is not clear on what the result will be. He said there are items in the June 30 DOE response to the DNFSB that concern him, particularly that DOE reports that WTP personnel do not express a loss of confidence in DOE. He said that even if one person is ostracized for being a squeaky wheel, DOE has failed, because removing them from their crew will make a larger impact. Sam noted differences between suppression and dissent, and said the senior managers and low level managers are weak elements for safety culture. Sam offered to draft language for the advice based on his concerns.

- Tom said he thinks the advice is well done but lacks a sense of urgency for DOE to address the problems. He said DOE frequently has to face safety culture issues but never seems to follow through. He said DOE is not taking the DNFSB's concerns seriously and they need to be. He said he agrees with the DNFSB that all issues with WTP need to be addressed now before it becomes too late or too expensive to address them.
- The committee agreed to the conceptual advice moving forward with additional work from issue managers. The draft advice will be reviewed once more by the committee before being sent to the full Board.

Committee Business

Update the 6 month work plan and determine committee call/meeting needs

The committee updated their 6 month work plan with intentions to confirm the work load and holding bin items on the Tuesday, October 18 committee call. The committee will hold a call in November, but determined not to hold a meeting in November, as both Dirk and Larry Lockrem, vice-chair, are unavailable. A meeting may be held in December, provided Executive Issues Committee approval and DOE's ability to support the topics. If the meeting is pushed to January, the committee will hold a call in December to plan January's agenda.

Handouts

C Farm Removal: Feasibility Study Highlights
 Document Review Cycle for M-45-80, M-45-81, M-45-100, and M-45-101
 Pulse Jet Mixer / WTP Presentation

Attendees

Board Members and Alternates

David Bernard	Rebecca Holland	Vince Panesko
Tom Carpenter	Pam Larson	Maynard Plahuta
Shelley Cimon	Susan Leckband	Dave Rowland
Sam Dechter	Larry Lockrem	Dick Smith
Dirk Dunning	Jeff Luke	Keith Smith
Laura Hanses	Liz Mattson	Bob Suyama
Harold Heacock	Sarah McCalmont	

Others

Chris Kemp, DOE-ORP	Jeff Lyon, Ecology	George Klinger, CTUIR
Bob Lober, DOE-ORP	Dan McDonald, Ecology	Shannon Cram, Public
Pamela McCann, DOE-ORP	Ginger Wireman, Ecology	Angela Day, UW
Joni Norton, DOE-ORP	Janet Badda, WRPS	Jessica Ruehrwein, EnviroIssues
Delmar Noyes, DOE-ORP	Susan Eberlein, WRPS	Melissa Thom, EnviroIssues