DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Board Public Meeting and Hearing

Thursday, March 22, 2012

Session I

1:00 p.m.

Three Rivers Convention Center

7106 West Grandridge Boulevard

Kennewick, Washington

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

DEFENSE NUCLEAR FACILITIES SAFETY BOARD)
BOARD PUBLIC MEETING AND HEARING)

PARTICIPANTS:

MR. PETER S. WINOKUR, Chairman
MS. JESSIE H. ROBERSON, Vice Chairman
DR. JOHN E. MANSFIELD, Board Member
MR. JOSEPH F. BADER, Board Member
MR. TIMOTHY J. DWYER, Technical Director
MR. RICHARD E. TONTODONATO, Deputy Technical Director
MR. RICHARD A. AZZARO, General Counsel
MR. RICK SCHAPIRA, Deputy General Counsel
MR. BRIAN GROSNER, General Manager
MR. STEVEN STOKES, Group Lead, Nuclear Facility Design & Infrastructure
MR. WILLIAM LINZAU, DNFSB Hanford Site Representative
MR. ROBERT QUIRK, DNFSB Hanford Site Representative

ALSO PRESENT:

(1:30 Panel Discussion)

MR. DALE KNUTSON, DOE Federal Project Director for WTP

MR. GARY BRUNSON, DOE Director Engineering Division for WTP

MR. FRANK RUSSO, WTP Project Director

MR. WILLIAM GAY, Assistant Project Director, WTP Vessel Completion Team and Plant Operations

MR. THOMAS PATTERSON, WTP Manager of Engineering

MS. DONNA BUSCHE, WTP Manager of Environmental and Nuclear Safety

MR. RUSSELL DANIEL, WTP Vessel Completion Team Technical Manager.

ALSO PRESENT (Cont'd):

(2:30 Panel Discussion)

MR. MATTHEW MOURY, DOE-EM Deputy Assistant Secretary for Safety, Security and Quality Programs

MR. SCOTT SAMUELSON, DOE Manager of the Office of River Protection

MR. DALE KNUTSON, DOE Federal Project Director for WTP

MR. PAUL HARRINGTON, DOE Assistant Manager of Engineering and Nuclear Safety for the Office of River Protection

MR. GARY BRUNSON, DOE Director Engineering Division for WTP

DR. FRED BERANEK, WTP Manager of Nuclear Safety and Plant Engineering

MR. THOMAS PATTERSON, WTP Manager of Engineering

MS. DONNA BUSCHE, WTP Manager of Environmental and Nuclear Safety.

I N D E X

P R O C E E D I N G S.

CHAIRMAN: Good afternoon. My name is Peter Winokur and I am the Chairman of the Defense Nuclear Facilities Safety Board. I will preside over this public meeting and hearing.

I would like to introduce my colleagues on the Safety Board. To my immediate right is Ms. Jessie Roberson, the Board's Vice Chairman. To my immediate left is Dr. John Mansfield. Next to him is Mr. Joseph Bader. We four constitute the Board.

The Board's General Counsel, Mr. Richard Azzaro, is seated to my far left. The Board's Deputy Technical Director, Mr. Richard Tontodonato, is seated to my far right.

Several members of the Board staff closely involved with oversight of the Department of Energy's defense nuclear facilities are also here.

Today's meeting and hearing was publicly noticed in the Federal Register on January 5 and March 8, 2012. The meeting and hearing are held open to the public per the provisions of the Government in the Sunshine Act. In order to provide timely and accurate information concerning the Board's public and worker health and safety mission throughout the Department of Energy's defense nuclear complex, the Board is recording this

proceeding through a verbatim transcript, video recording, and live video streaming.

The transcript, associated documents, public notice, and video recording will be available for viewing in our public reading room in Washington, DC. In addition, an archived copy of the video recording will be available through our website for at least 60 days.

Per the Board's practice and as stated in the Federal Register notice, we will welcome comments from interested members of the public at the concussion of testimony, approximately 3:45 p.m. this afternoon for Session I and approximately 8:30 p.m. this evening for Session II.

A list of speakers who have contacted the Board is posted at the entrance to this room. We have generally listed the speakers in the order in which they contacted us or, if possible, when they wished to speak. I will call the speakers in this order and ask that speakers state their name and title at the beginning of their presentation.

There is also a table at the entrance to this room with a sign-up sheet for members of the public who wish to make a presentation, but did not have an opportunity to notify us ahead of time. They will follow those who have already registered with us in the order in

which they have signed up.

To give everyone wishing to make a presentation an equal opportunity, we ask speakers to limit their original presentations to five minutes. The Chair will then give consideration for additional comments should time permit.

Presentations should be limited to comments, technical information, or data concerning the subjects of this public meeting and hearing. The Board Members may question anyone making a presentation to the extent deemed appropriate.

The record of this proceeding will remain open until June 23, 2012.

I would like to reiterate that the Board reserves its right to further schedule and regulate the course of this meeting and hearing to recess, reconvene, postpone, or adjourn this meeting and hearing, and to otherwise exercise its authority under the Atomic Energy Act of 1954, as amended.

The Board's statutory charter is to ensure the adequate protection of the public health and safety, including safety of the workers. In the case of the Waste Treatment Plant, however, this statutory charge is made more complex because we are not just concerned about whether this plant can operate safely, we are also

concerned about whether the plant is fully capable of processing the large volume of toxic and radioactive wastes now stored in underground tanks at Hanford. The oldest tanks, which were built with a 20-year design life, date back to World War II and will be almost 100 years old by the end of the projected treatment mission. The Board therefore inquired into many issues that involve a mixture of accident risk and the ability to reduce risks posed by continued storage in Hanford's tank farms due to potential performance limitations of the Waste Treatment Plant.

The Board recognizes that the Waste Treatment Plant serves a vital function in the cleanup of the Hanford Reservation, and that it is important to get the plant operational. However, the Board also recognizes that the Department's decision to pursue a design-build, fast-track approach for this project involves potentially greater risk than would a traditional design and construction approach. What concerns the Board are the Department's decisions to continue design and construction of the plant when there are many major unresolved technical issues that can impact not only safety-related controls needed to protect the public and workers, but also the reliability and capability of a plant that must operate safely for decades. Once the

plant is operating and processing radioactive waste, options for physical changes in process cells will be extremely limited, costly, and likely to expose workers to hazardous situations. To the maximum extent possible, solutions to design and operational issues must be accommodated before commissioning. A learn-as-we-go operating philosophy is not prudent or safe for this facility.

The Board held a hearing at Hanford in October 2010 to better understand the project's progress towards resolving technical issues dealing with mixing, hydrogen control, and safety basis development. The Board's evaluation of the technical issues was broadened in December of 2010 to include an investigation into the project's safety culture after the Board received a letter from Dr. Walter Tamosaitis, a former engineering manager for the project. In his letter, Dr. Tamosaitis alleged that he was removed from the project because he identified technical issues that in his view could affect safety. He further alleged that there was a flawed safety culture at the project.

The Board's investigation concluded that the Waste Treatment Plant project suffered from serious problems in safety culture and in the management of safety issues. As a result, the Board issued

Recommendation 2011-1, Safety Culture at the Waste Treatment and Immobilization Plant, on June 9, 2011, identifying the need for prompt, major improvement in the safety culture of the project. From the Board's perspective, the "flawed" safety culture at the Waste Treatment Plant is an indicator that significant organizational weaknesses may be adversely impacting the project's ability to identify, address, and resolve critical technical issues, which directly impact the ability of the plant to treat waste safely and efficiently. The Department of Energy accepted the Board's Recommendation and is executing a plan to fully characterize and address problems in safety culture at the Waste Treatment Plant.

The Department has now completed assessments of safety culture that make it clear that the project has a problem with the timely identification and resolution of technical issues. Pivotal unresolved technical issues that affect safety include the effectiveness of the plant's mixing and transfer systems, the potential for erosion and corrosion of process equipment that is not designed to be accessible for repair or replacement, the effectiveness of the strategy for preventing equipment damage and release of radioactive material due to hydrogen explosions in process systems, and the ability

of the Tank Farms to deliver waste that is demonstrated to meet the Waste Acceptance Criteria that will be established for the treatment plant.

Taken together, these unresolved design issues challenge the ability of the plant to safely and efficiently perform its mission. Moreover, the project must fully address the need to develop a defensible safety basis for the facility. This safety basis will be embodied in a collection of Documented Safety Analyses per the requirements of DOE's Nuclear Safety Management Rule, 10 CFR its code of regulations Part 830, and its associated standard, DOE-STD-3009, Preparation Guide for DOE Nonreactor Nuclear Facility Documented Safety Analyses. When the Department approves those documents they will serve as a license to safely operate the facility.

In this afternoon's session, the Board plans to receive testimony concerning: (1) the significance of the timely integration of safety into the Waste Treatment Plant's design and (2) the relationship between the resolution of safety issues and the development of a sound nuclear safety strategy in support of a defensible safety basis for the facility.

To illustrate these challenges, the Board will explore two areas of technical concern: Erosion/

corrosion and pulse jet mixing. We do not intend to have an exhaustive technical discussion, but rather an overview of how the project is addressing and resolving these issues and integrating adequate safety controls into the design and safety basis for the facility. We will focus on the potential impact unresolved technical issues have on nuclear safety aspects of the plant's design and ability to treat waste. We will spend some time receiving testimony from senior project and Department personnel on their perspectives concerning the accumulating risks associated with these unresolved issues, both during this hearing and a subsequent hearing to be held in Washington, DC, on May 22, 2012.

In the session that will follow tonight, we will receive testimony concerning DOE's progress towards implementing the Board's Recommendation on the project's safety culture. The Board is convinced that strengthening the project's safety culture will be the key to improving how the project resolves technical issues like the ones discussed in this afternoon's session. These two topics, safety culture and resolution of technical issues, are intimately related and closely linked. The Board believes that the keys to resolving technical issues and building a strong safety culture are two sides of the same coin.

This concludes my opening remarks.

I will now turn to the Board members for their opening remarks. Ms. Roberson.

VICE CHAIRMAN: I have no statement at this time, Mr. Chairman.

CHAIRMAN: Dr. Mansfield.

DR. MANSFIELD: Nothing at this time.

CHAIRMAN: Mr. Bader.

MR. BADER: No comments.

CHAIRMAN: This concludes the Board's opening remarks. At this time I'd like to invite Mr. Scott Samuelson, DOE Manager of the Office of River Protection to the witness table to provide a statement on behalf of the Department of Energy.

Mr. Samuelson, we'll accept your full written statement and testimony. I'd like you to, if possible, limit your comments to 10 minutes or less.

MR. SAMUELSON: Thank you. Certainly. Thank you. Good afternoon, Mr. Chairman. Thank you and the other Board Members, Board Staff, and members of the public. We appreciate this opportunity to discuss progress at the Waste Treatment Plant and our ongoing work to resolve the technical issues and strengthen our nuclear safety culture. I look forward to an open and productive exchange today.

As manager of the Office of River Protection, I am responsible for the entirety of the River Protection Project. That includes ensuring that 56 million gallons of chemical and radioactive waste in Hanford's underground tanks is safely stored while we put in place the capabilities to safely retrieve, deliver, treat and immobilize that waste, and close the tank farms. We appreciate the Board's recognition of the risk posed by Hanford's tank waste and your role in helping to protect the public and workers by helping to ensure our treatment solution at Hanford is both safe and capable. It is critical -- all right, thank you -- it is critical that we view and discuss the challenge before us as "One System," as all of the activities within the River Protection Project must work together to address the risk posed by the tank waste. To this end, one of my highest priorities has been to improve alignment of the WTP and the Tank Farms through the One System approach, improving our ability to address technical issues and challenges. This approach was created to develop the most effective solutions to technical issues and to manage overall schedule and cost risk as we prepare for waste treatment. I am pleased to inform you that this approach is moving forward, and is an essential element in developing responses to Board Recommendation 2010-2 (Pulse Jet

Mixing at the Waste Treatment and Immobilization Plant).

I'd like to assure you that I recognize the unique responsibility of my role in the department's self-regulating environment, and that I believe safety is absolutely fundamental to everything we do. Without that foundation, we cannot be successful, and failure to achieve this mission safely is not acceptable - a value that I believe the Board and the Department share equally. To be successful, we must instill a culture where executing this mission is a belief shared by all and is widely recognized and valued that safety is a belief shared by all audit is an essential element of the design, construction and operation of our One System.

As the Board has pointed out, the WTP is a Design-Build project, and therefore incorporates an iterative design process with risk-based decisions related to procurement and construction. In this approach, early project conservatisms are expected to be refined over time as the design evolves, the safety basis is further developed and studies and analyses clarify uncertainties. In some cases, the completed studies and analyses identify new hazards or the need to increase the design or safety margins, as may be the case in any project approach. In all cases, the ability to meet safety and functional requirements will be verified prior

to introducing any hazardous materials to the plant.

Since your last public meeting, the project has been the focus of assessments and surveys related to safety culture and quality, and we are identifying and incorporating these opportunities for improvement and how best to address them. These assessments have highlighted that resolution of technical issues in a manner which is transparent, thorough and reflective of our commitment to safety is critical to our mission. We acknowledge and understand the relationship between safety culture and the resolution of technical issues. We will continue to strengthen our resolution processes to assure diverse viewpoints are welcome, that we demonstrate our commitment to understand the issues, and deliberately and transparently determine and communicate our response.

We are committed to building a vibrant and sustainable safety culture at Hanford; however, we must also remain vigilant not to allow concerns regarding our current conditions to create barriers to aggressively addressing the known safety issues. At the same time, and in concert with my earlier remarks about One System, we will also ensure that we are addressing safety culture for the entire River Protection Project, and not limiting our focus to a single element of that system.

DOE acknowledges the need to resolve technical

issues associated with this first-of-a-kind nuclear waste processing facility. As part of the design assurance process, DOE directed the WTP Project to convene an External Flowsheet Review Team in October 2005 and continues to address actions identified by that team. The EFRT identified 28 issues as part of the review, including mixing, erosion and corrosion. The structural integrity of the WTP vessels and piping is vital to ensuring the WTP can be operated for its design life, especially due to the design which does not allow access to the equipment without significant cost and schedule impacts once the facility goes hot. The erosion and corrosion, and hydrogen issues continue to be evaluated by DOE, the Board and external review groups from academia and industry.

During the public meeting in 2010, DOE made a commitment to large-scale testing for pulse jet mixed vessels to manage residual risk related to overall mixing performance. This commitment became the foundation for the Implementation Plan to address Recommendation 2010-2. The plan provides a framework to resolve the pulse jet mixing issue, and requires the integration of Nuclear Safety and Engineering activities for both WTP and Tank Farms. Relative to nuclear safety the plan addresses criticality, flammable gas, and material

failure of process vessel components arising from inadequate mixing of Pulse Jet mixed vessels at WTP.

Mixing is the most challenging technical issue remaining for the Pretreatment Facility, and is driven by the uncertainties in the waste feed streams as well as the ability to define and calculate the performance of the full scale pulse jet mixed vessels. The Department has made progress in closing safety issues related to Pulse Jet Mixing and large scale integrated testing. Testing will be conducted three different scales, 4-foot, 8-foot, and 14-foot. The 14-foot tests represent full scale tests for some vessels in the Pretreatment Facility. The 8 foot test vessel has been installed and water runs are in the progress. Testing is forecast to start in late April pending final comment resolution on the test documentation and submittal of that documentation to the Board in accordance with our Implementation Plans. Design of the 14-foot test facility is 90 percent complete and is currently being reviewed. In addition, civil and structural work has been started on this new test facility and the current forecast to start operation of the facility is the summer of 2013. We invite the Board to join us for a tour of these test facilities on a future visit to Hanford.

DOE realizes the complexity and breadth of the

effort that must be accomplished to address the outstanding technical issues, and has developed plans to ensure their resolution. These issues must be resolved in an open and transparent manner to assure ourselves, the Board, and the public that we are designing, constructing and will commission a facility that can safely be operated over its mission life. Without the kind of transparency provided by this hearing, panel discussions along with independent external reviews, stakeholder briefings, open houses and web-based information access, our activities cannot gain the confidence of the public that we need in order to be successful.

At the time of the 2010 public meeting, we were transitioning from a design/construction phase to a construction/commissioning phase. We are now at another critical point in the project as we begin to re-plan our path forward to project completion. During this process, our highest priority is to meeting our commitments to ensure resolution of outstanding technical issues consistent with out DNFSB commitments, and improving the alignment between the safety basis and the design basis in a structured, thorough and thoughtful manner.

In summary, we will remain committed to the safety of our workers and the public, and the protection

of the environment. We fully embrace our oversight role, and will continue to bring resources to bear as needed to identify and resolve issues that may impact the success of the ORP mission. As part of this oversight and issue resolution process we will continue to access and utilize key resources within DOE and contractor teams, as well as from industry, academia and the National Laboratories. Our One System approach improves our ability to make mission-based decisions that reflect a comprehensive approach to accomplishing our mission. We understand the importance of listening, thanking those individuals who express differing views, and providing respectful and technically sound feedback on the decisions we make after careful consideration of all available input.

Thank you again for the opportunity provided by this public hearing. We are looking forward to addressing your questions.

CHAIRMAN: Thank you, Mr. Samuelson, for the opening statement on behalf of the Department of Energy. At this time the Board would like to recognize Steven Stokes, who is the group lead for Nuclear Facility Design and Infrastructure on our staff. He's going to briefly discuss the status of the project's technical resolution efforts and the development of its nuclear safety strategy to set the stage for this hearing's panel

discussions. Mr. Stokes, please proceed with your statement.

MR. STOKES: Good afternoon Mr. Chairman and Members of the Board. For the record, my name is Steven Stokes, and I'm the Board's Lead for the Nuclear Facilities Design and Infrastructure. I'm responsible for the Board's staff reviews of design and construction projects.

This testimony will address concerns of the Board's staff regarding unresolved safety issues and development of safety-related controls for the Waste Treatment and Immobilization Plant (WTP).

The erosion and corrosion of plant systems and pulse jet mixing are both long-standing technical issues at the WTP. The following testimony provides background information and discusses status of efforts to resolve these issues, and development of the WTP nuclear safety basis.

For perspective, erosion/corrosion issues are a long standing concern at the WTP. Beginning in October 2001, a material of construction Blue Ribbon Panel evaluation recommended the project team consider upgraded materials for vessels that contain solutions with high "pitting" potentials unless the process chemistry conditions could be better defined. This review was

followed by reviews in February 2004, two reviews in July 2004, and reviews in March 2006 and May 2008.

Interestingly, although many of these early concerns are considered resolved by Bechtel National Incorporated's (BNI's) project team, the findings from early reviews share common themes with the findings from recent Department of Energy and Board reviews. The common themes are: Literature studies are used instead of laboratory testing to establish both general and localized wear rates and margins; use of average material performance; poor understanding of waste chemistry; and considering the level of uncertainty, inadequate wear margins.

In 2011, the DOE-WTP Engineering Department conducted surveillances that identified issues with material selections for some vessels. DOE's primary concern was that some vessels would be operated at temperatures high enough to make localized corrosion failures possible.

In its other surveillance, DOE noted that the selection of materials for certain process vessels was based on literature information, but the literature cited was not directly relevant to WTP process environments. The use of literature values without direct relevance results in substantial uncertainty and is not appropriate

to establish vessel operating envelopes with adequate safety margin. DOE determined that the operating temperature for at least six Pretreatment Facility vessels, three High Level Waste Facility vessels, and one Low Level Waste Facility vessel is above the temperature where localized corrosion failures might occur. In response to DOE's ongoing concerns, BNI has agreed to a number of technical studies and actions designed to resolve DOE's concerns.

In a separate action, the Board provided a letter to DOE in January 2012, communicating its concerns that design wear allowances for vessels, piping, and PJM nozzles may not be adequate. On March 5, 2012, DOE responded to the Board's letter. DOE and BNI have outlined a number of technical studies and actions they believe will resolve the Board's concerns. DOE also reiterated their commitment to hold additional vessel placements until they have confidence vessel wear allowances are adequate and the WTP can operate safely and reliably for its 40-year mission life.

Mixing is also a very long standing issue at the WTP. Beginning in June 2000, when British Nuclear Fuels Limited (BNFL) completed the conceptual design for the pulse jet mixing system until now, work has been ongoing to address various mixing problems. For example,

beginning in 2001, when BNFL concluded that testing was required to develop and optimize the Pulse Jet Mixing's ability to mix high-solids and high viscosity fluids, until March 2006, when the External Flowsheet Review Team, or EFRT, identified their PJM mixing issues, unresolved issues have and continue to exist. Following the 2006 EFRT review until recently, testing has been conducted at Pacific Northwest National Laboratory, Mid-Columbia Engineering, and other facilities in an attempt to resolve the mixing issues. In its latest test program, the Large Scale Integrated Test, or LSIT program, testing will be ongoing from 2012 until 2016.

Specific to pulse jet mixing, there are still three main unresolved safety issues:

1) The accumulation of fissile material at the bottom of vessels leading to potential criticality; 2) The generation and accumulation of hydrogen gas resulting from the accumulation of solids; and 3) the possibility that accumulating solids will interfere with the vessel-level detection system leading to a loss of pulse jet mixer control and overblows.

The Department of Energy's mixing issue resolution efforts are linked to the Board's Recommendation 2010-2, Pulse Jet Mixing at the Waste Treatment and Immobilization Plant. DOE is just

beginning to respond to the Board's recommendation, and has not yet completed its preparations to begin testing associated with the LSIT program; although, work to prepare for testing has been underway for the past several months.

In one of its first actions in response to the Board's recommendation, DOE identified 99 known technical issues associated with pulse jet mixing that require resolution. These issues are related to: Criticality, PJM control and performance, vessel pump out, identification of design margin, validation and verification of computer models, erosion/corrosion, integration of nuclear safety into design, and waste characterization uncertainties.

To address these issues, DOE provided the Board with a summary level plan and notional schedule. This plan identified a high level process for developing the safety-related controls for mixing and described the activities they plan to undertake to identify and evaluate the hazards associated with these issues. However, DOE did not identify how or when each issue will actually be resolved.

BNI's early testing activities support design verification and vessel placement while later testing will determine mixing performance limitations and support

development of Waste Acceptance Criteria.

BNI's early test schedule is focused on completing design verification and installing the remaining vessels to support construction. Based on the schedule provided to the Board, vessel installation is planned to precede testing to determine mixing performance limitations, development of the Waste Acceptance Criteria, and reconstitution of the safety basis, by several years.

As part of DOE's effort to describe the 99 known technical issues, DOE acknowledged the existence of deficiencies in the WTP safety basis and informed the Board that they will reconstitute the Pretreatment Facility safety basis. Clearly, this effort will be made more difficult by the number of unresolved technical issues the project is addressing that impact safety and the need for controls. Reconstituting the safety basis is a significant development and a major undertaking, particularly at this stage of the WTP project.

To reconstitute the safety basis, DOE plans to complete a hazards analysis, accident analysis, and evaluate safety-related control selections to address any associated unevaluated hazards. The Board's staff believes reconstituting the safety basis is warranted, and will likely reveal that the existing safety-related

controls are not sufficient to meet DOE nuclear safety requirements. The staff anticipates that as BNI begins resolving the known technical issues, validating assumptions used to advance the design, and reconstituting the safety basis, changes to the existing safety-related controls or the control philosophy will result.

Additionally, reconstituting the safety basis at this stage in the WTP project has the potential to be both very costly and difficult to implement. As such, there is potentially much greater reluctance to make changes now than it would have been earlier. For example, the WTP has decided to "pivot" the project from design to construction and operation. Properly reconstituting the safety basis has the potential to stop or delay "pivoting". Secondly, reconstituting the safety basis, a difficult undertaking under the best of circumstances, is more difficult for a fast-track, design build project. And, the existence of unresolved technical issues further complicates the reconstitution process since many of these issues will require further testing as part of their resolution, which takes time to complete. The Board's staff primary concern is that the potential for significant project impacts can inappropriately influence decision makers or project

personnel due to the difficult or unpopular nature of these decisions.

DOE is aware of this risk and has attempted to institute processes to prevent installation of systems or components which have irreversible impacts on the project. For example, BNI used the management suspension of work process to prevent further design or installation of systems not aligned with the nuclear safety basis. BNI is developing a process to define when the installation of equipment poses unacceptable project risk as part of their design verification process. This process will be designed to ensure that design verification is completed before installation becomes "irreversible".

On March 6, 2012, in response to DOE concerns, BNI committed to develop and implement a process that establishes risk decision criteria to evaluate installation of equipment with incomplete design verification and to document these decisions. The Board's staff reviewed BNI's proposed process and observed that nuclear safety considerations are not currently considered when determining if proceeding with incomplete design verification poses an "acceptable risk". The Board's staff believes that failing to include nuclear safety considerations in this

determination is inappropriate given that the design verification process must address applicable nuclear safety aspects of the design.

This concludes my remarks.

CHAIRMAN: Do the Board members have any questions for Mr. Stokes? Seeing none I want thank you for your testimony. And we will move to our first panel. I would like to invite the first panel, the witnesses from the Department of Energy and its contractor organizations to discuss unresolved technical issues at the Waste Treatment Plant with a focus on the issues of erosion and corrosion and pulse jet mixing. Would the panel members please take your seats as I introduce you.

Mr. Dale Knutson, DOE's Federal Project Director for the Waste Treatment Plant; Mr. Gary Brunson, DOE's Director of Engineering Division for the Waste Treatment Plant; Mr. Frank Russo, the Waste Treatment Plant Project Director; Mr. William Gay, the Associate Project Director for the Waste Treatment Plant Vessel Completion Team and Plant Operations; Mr. Thomas Patterson, Waste Treatment Plant Manager of Engineering; Ms. Donna Busche, the Waste Treatment Plant Manager of Environmental and Nuclear Safety; Mr. Russell Daniel, the Waste Treatment Plant Vessel Completion Team Technical Manager.

The Board will either direct questions to the

panel or individual panelists who will answer them to the best of their ability. After that initial answer other panelists may seek recognition of the Chair to supplement an answer as necessary. If panelists would like to take a question for the record, the answer to that question will be entered into the record of the hearing at a later time.

Does anyone on the panel wish to submit written testimony at this time? Seeing none I'd like to thank each of you for your testimonies today. With that we will begin with questions from the Board members. And I believe we will begin with Dr. Mansfield.

DR. MANSFIELD: Thank you, Mr. Chairman. Mr. Brunson, the Department currently has outstanding surveillances related to caustic stress corrosion cracking of the ultrafiltration system and materials selection for a number of WTP vessels. Can you describe what issues are still open related to these surveillances?

MR. BRUNSON: Yes, sir. There -- I believe what you're referring to are two surveillances. One came out in I believe the July/August timeframe of 2011.

CHAIRMAN: Could you position the microphone a little closer?

MR. BRUNSON: Yes, sir. I believe what you're

talking about are two surveillances, one came out of the July/August timeframe and the other one came out I believe in the -- I'd have to go back and look at the record. What the two issues deal with is is the first one had to do with caustic stress corrosion cracking. And that was primary with two vessels, UFP2 alpha and bravo, those are the actual leaching vessels. And I noticed when I got here -- I arrived on the project in late May of 2008. My previous assignment I was a laboratory director for the Navy so I was fairly familiar with metallurgy.

When I looked at the vessels I saw that they were made out of a carbon -- excuse me, a stainless steel. The first, I believe UFP1 is a 316 and UFP2 is a 304 L. When I looked at that I had a concern about it so I immediately placed a call back and talked to some metallurgists that I worked with before and I just asked them a question, I said, Hey, I've got something, I have a high caustic, I'm running up around 85, 90 degrees celsius. What would you guys recommend that this material be in? They called me back in about an hour and they said it should be a Hastelloy material. Hastellog.

So based on that I kind of -- on my board I keep a list of issues that I'm concerned about, so I put it on the board and at that particular time DOE did not have an

adequate engineering staff, as told to me by Mr. Eschenberg, who was the federal project director at the time.

So at that point in time I started bringing people on. And one of the people I found was when they shut down Yucca Mountain a gentleman named Mr. Bob Fish, so I went down there and I picked him up. And Mr. Fish is, he is experienced at metallurgy and materials, both a bachelor's and master's from Oregon State.

So I talked to Mr. Fish and expressed my concern, and told him that I had a job for him and he conceded to come up. So when he got up what I told him was is the first thing I needed him to do was start looking at materials. So when those reports came out the first one had to do with caustic stress corrosion cracking. And there was information that was related to that that when you specifically looked at the region that we were operating in you would have to do some extrapolation in order to make a determination that the material was satisfactory for that. So that was the first one.

The second one had to do with general materials of selection for vessels in the plant. And this may also include piping. And when Mr. Fish looked at that we went back and we looked at some process corrosion data sheets.

And we saw in there that there was a suggestion made by a peer review team, I can't remember the specific timeframe, I think it was back before 2004, 2005, and that data sheet specifically stated that for this vessel you should pick something that has at least a 6 percent molybdenum content. When he showed that to me I was concerned about that so I told him to go ahead and surveillance it, so he went ahead and wrote that surveillance up. So those two items are open right now.

And there was another item that came up and was just issued this past week and that was written by Dr. Alexander, he was the lead on that. This came out of ORP Nuclear Safety Division. And that one cited, I think there was a couple level one findings, two level one findings, four level two findings associated with erosion.

DR. MANSFIELD: Thank you. That's a good answer.

Is the process of surveillances producing the kind of response from the contractor that you want?

MR. BRUNSON: No, not to date, not to date. I have not been satisfied to date with the response from the contractor associated with those. And we are working with the contractor. And we have developed a plan as part of -- Mr. Gay is managing the vessel completion

team, and that is within his realm of responsibility. And there's a plan right now that he's developing and it is to address erosion/corrosion issues specific to vessel completion.

DR. MANSFIELD: The last part of my question is about wear allowances in the piping and the pulse jet mixing nozzles. Does the Office of River Protection share the Board's concern on this erosion/corrosion issue?

MR. BRUNSON: Yes, sir.

DR. MANSFIELD: That's all, Mr. Chairman.

CHAIRMAN: Mr. Bader.

MR. BADER: Mr. Brunson, I read with considerable interest a letter that Mr. Bradford sent to Mr. Knutson on March 9, 2012, that outlines the BNI plan to resolve erosion issues raised by the Board and corrosion issues raised in your recent surveillances concerning the corrosion testing for the ultrafiltration process vessel materials of construction and the materials selection for other process vessels.

As Mr. Stokes pointed out in his opening remarks and discussed in his -- and discussed in some of your testimony, these issues have been around in one form or another since 2001. And according to the information that I pulled together again in February 2004, July 2004,

May 2008, now it's 2012, and based on the findings documented in your surveillances and in our letter, erosion and corrosion performance of the materials used to fabricate key safety components for WTP systems remains a significant question.

What I found interesting about the letter is that there really is no intended change in BNI's approach to resolving the problem. They intend to review additional information from the literature, convene another study group, and produce some additional reports. Only if they find something negative during the study effort will actual tests be performed of materials. Based on what you know do you believe these efforts outlined in their letter will answer the questions that need to be answered.

MR. BRUNSON: I have staff members that are intimately involved with the review of the contractor's plan for resolution of erosion and corrosion. From my perspective and my paradigm I cannot design and verify a nuclear facility with words like believe, think, extrapolate. I can't deal with that. My paradigm says that I must know. So with respect to that, I'm going to wait until I see the plan. But I can assure you one thing and that is that my expectations are much aligned with defense board staff with respect to resolution of

erosion/corrosion. And I have talked to my manager, Mr. Dale Knutson, and expressed my concern with regard to my expectations and he has assured me that he does not want me to lower my expectations.

MR. BADER: Mr. Patterson. Thank you. What systems in the pretreatment facility are impacted by unresolved technical issues related to erosion and corrosion?

MR. PATTERSON: Certainly the major systems are related to -- sorry -- the major systems are related to those --

(Interruption occurred.)

MR. BADER: I'm sorry, could you start over again, please, Mr. Patterson?

MR. PATTERSON: The major systems are those related to the vessels where we have Non-Newtonian fluids, where we have Newtonian fluids with high solids, where we have PJM's in the vessels and the associated piping with that. Those are the areas of significant concern that we have as well as DOE. And those are the things that we are really concentrating on today and will concentrate on those until we resolve them to everybody's satisfaction.

MR. BADER: You've heard the discussions so far, do you believe testing will be necessary to resolve those

issues?

MR. PATTERSON: I actually do believe some testing will be required. Based on the information we have today and the information from the beginning of time when we started in 2001, there are areas that indeed we need to look at further. And I just don't believe that just literature searches are going to be satisfactory to satisfy ourselves, let alone DOE and the Defense Board.

MR. BADER: Peter.

CHAIRMAN: I'm going to go a little bit out of sequence because I -- I think it's only fair at this point to ask the federal project director, Mr. Knutson, what your sense of things is because Mr. Brunson has made some statements and expressed his concern about erosion and corrosion and the Board has done the same. You can give us your perspective on this now?

MR. KNUTSON: Yes. Thank you, Mr. Chairman. From a federal project director's perspective, it is actually a great comfort to have an engineering director like Gary Brunson working on our team.

As we spoke with you the last time we were together, our commitment to issues of mixing and erosion and corrosion and the M3 and the M2 process included a three-phase strategy. And phase one was the ability to stand up a team that was actually focused on the

specifics of the requirements and focused on essentially what is today called the vessel completion team. That vessel completion team is doing a very good piece of work associated with making sure that systems and the requirements associated with those systems are being verified. And Gary's a very significant part of that, as is Tom Patterson and a group of others. And it's led by Mr. Gay.

Phase two of that is associated with the testing program that we committed to in September of 2010. That is now informed by the 2010-2 recommendation and the further evaluation that we have done in beginning to flesh out those deliverables.

So in general, my sense is that number one, people are taking it very seriously. The issues of erosion and corrosion have never stopped being a very serious issue and people are actually capturing those issues in a way that is different than than they had been captured in the past. And item two we haven't stopped looking. And the vessel completion team is there to help us ensure that our path forward is demonstrable and thorough.

CHAIRMAN: The other thing I'm trying to get at is you're the federal project director, you're responsible for this whole thing. What's your

perspective on the fact that it's taken so long and we still haven't -- you haven't -- the project hasn't fully resolved the issues with erosion and corrosion, which you know are extremely important to many systems that Mr. Patterson talked about and to your ability to guide the project to place the vessels in the facility and actually get this job done.

MR. KNUTSON: So I think it's important for the context of that long history to be made part of the record. There are 28 or 29 different analyses and reports that are have captured various aspects of erosion and corrosion. I think it is important that when you are tackling something that is as difficult to resolve as an erosion and corrosion challenge that involves physical parameters, chemical parameters, operational parameters, that you not limit yourself to a process that is driven by a desire to accomplish something quickly.

I think as we've said and have said many times, our mantra in the Department of Energy is deliberate haste. And the process of deliberate involves ensuring that as we understand more from our testing programs, we're able to adapt to that. And as we learn more from our engineering processes, we adapt to that. And that we ensure that our management processes don't allow us to install something that doesn't match up with the safety

basis or hasn't met the requirements of design. And I believe those processes are in place today.

CHAIRMAN: Ms. Roberson.

VICE CHAIRMAN: Thank you, Mr. Chairman. Actually, I have a few questions for you, Ms. Busche. How you doing this afternoon?

MS. BUSCHE: Great.

VICE CHAIRMAN: Good. I have a few questions for you about your role. I think this is an important topic to you. And it is related to a key commitment in the Department, let me find my note, it's a key commitment in the Department's Recommendation 2010-2 implementation plan. And the title of the commitment is establish a plan and schedule to systematically evaluate the hazards of known technical issues. Is that one familiar to you?

MS. BUSCHE: Yes, ma'am.

VICE CHAIRMAN: Okay. My understanding is in that plan you identify four unresolved issues associated with erosion and corrosion. Can you tell us what those four issues are?

MS. BUSCHE: Not off the top of my head I can't.

VICE CHAIRMAN: Not off the top of your head. Can you tell us really what your challenge is in trying to reconstitute the safety basis and deal with unresolved

technical issues in this area?

MS. BUSCHE: I think the predominant area where I've been working with Tom Patterson in engineering is to reconstitute the safety basis we actually, I believe, have to take a step back and look at some fundamentals. All right? It's been a long journey since the last time we visited on where we were with the safety basis, but on the topic of erosion and corrosion I'll give an example. And I think it will be consistent with the rest of the hazards throughout the pretreat facility.

The engineering analysis to date, the studies to date, my understanding of them -- I'm a nuclear engineer, not a material expert -- are based on process knowledge, process models that are very geared towards throughput, actual values, anticipated ranges in temperatures, maximum expected volume. But they're not -- they have not included the nuclear safety analysis. So what that means to me is we haven't adequately looked at what happens if we mis-transfer and we have a chemical reaction we didn't anticipate in that throughput model. So there may be some very key functional requirements that have not been captured into the design.

So as we go forth and do this systematic evaluation of hazards, we will have to look at the existing safety basis, the existing design, in some cases

we may have designed in a hazard. And then we'll have to peel back that onion and figure out what's the right hazards and accident analysis that drive those functional requirements for the ultimate safety control strategy.

VICE CHAIRMAN: And so give me a little sense. I'm not quite sure where you started, in a sense you still have unresolved information. How are you going to approach this?

MS. BUSCHE: We -- I think we're going to have to start to with first principles. So we have some draft plans for -- in getting for both but all of the facilities. And I'll speak in generalities. We need to understand what hazards and accident analysis do exist today and be very candid upon ourselves is it adequate. We also need to understand what is the process because if we don't understand the process, you can't understand the hazards. We have to then look at the P&IDs, the design as it exists today and the supporting engineering calculations that would drive the process. And then once you understand that body of knowledge, then you can begin that systematic evaluation of hazards. And it will, I think Steve summarized it, it's an arduous task at this stage.

VICE CHAIRMAN: Okay.

CHAIRMAN: Can you stop for a moment for our

audience, I eluded to my testimony, Mr. Stokes did, tell folks what the safety basis is and what you mean when you reconstitute it or re-baseline it. And do this in less than 2000 words.

MS. BUSCHE: The safety basis in simple terms is where we will look at the facility, what the facility is intended to do, in our case it will be processing waste, or conditioning waste that will ultimately go to a melter. In doing that process we look at upset conditions, accident conditions, and we look at the broad range of things that could go wrong. And then we interpret that information from a hazards and accident, and we communicate to engineering system requirements, functional requirements, to make sure we control the hazards. At the end of the day we'll have a control set.

Now, to reconstitute it it really is setting back the safety basis we have today and starting with first principles. It is taking it back.

CHAIRMAN: And that reconstitution came about from the fact that there are unresolved technical issues on the project?

MS. BUSCHE: Yes, there's unresolved technical issues. And when we were resolving them I don't believe we -- my professional opinion, we weren't doing it holistically or systematically. We're looking at what's

the pulse jet mixer problem? What's the fissile material accumulation problem? What's the hydrogen generation? And at the end of the day I have to have an integrated control strategy because some of those controls that we have today compete. So I can solve the hydrogen generation problem, right? By one or two pulse jet mixers working and create a fissile accumulation hazard because I don't have enough movement to prevent the accumulation. So it is a very delicate balance.

CHAIRMAN: Thank you. Mr. Bader.

MR. BADER: Ms. Busche, let me just ask a clarifying question. When you're done with your safety basis, that is your input to the documented safety analysis, correct?

MS. BUSCHE: Correct.

MR. BADER: And my simple picture of what the documented safety analysis constitutes is effectively the license to operate the facility.

MS. BUSCHE: Correct.

MR. BADER: Thank you. Mr. Patterson, let me come back to you for a moment. In listening to what has gone on before in terms of similar efforts that have been done to resolve the erosion/corrosion issues, do you think this time you're going to be successful and what -- if you think it will be successful what elements of the

plan that's being developed do you think will make it successful?

MR. PATTERSON: Okay. First of all, when I look back I'm sure many other people in my position previously thought we were successful several times over. But as new information became available throughout these 12 years, 11 years, each one found that indeed we weren't successful. Even though we closed the issues that came up at the time, we found other things were opening these issues, reopening these issues as a result of different and varying input.

So as we move forward, provided we have a clear understanding of the inputs, and this is the difficult one, a clear understanding of the inputs coming in from the tank farm, then with that clear understanding and using that as the basis, it doesn't change, and then I would say yes. The issue is that we have an ever changing input, defining that input is very complex. And, therefore, we need to deal with it. And as a result it could reopen again and again and again based on that variation.

So what we need to do in the future is certainly establish what we call our Waste Acceptance Criteria and make sure that is something that we can all buy into today that we feel it is conservative. And once we

determine that that is conservative and that's what we're going to use going forward and then yes, we can solve this issue.

MR. BADER: Doesn't it involve not only defining what the Waste Acceptance Criteria are for the -- from the tank farms, but also any changes in materials as they go through the process?

MR. PATTERSON: There's no question that the process itself, which we are continually tweaking, will have an impact. And that will be part of it, Mr. Bader, yes.

MR. BADER: How do you plan to determine what those changes and impact -- first of all, what the changes are in the characteristics of the material?

MR. PATTERSON: As it's going through, sir?

MR. BADER: As it's going through the process.

MR. PATTERSON: We have certainly various programs that we use to determine what the process is all the way through. And we look at that process in terms of normal conditions, we look at upset conditions, we look at it during flushes, during steam cleaning or acid cleaning. So we look at those processes as we go through the system to determine the impact on erosion and corrosion. So that is a fairly well-established process. What we need to assure ourselves is that we've captured

all the upset conditions and the time these upset conditions will occur. And I think we are getting a better and better understanding of those conditions. And as a result we will come to a conclusion on that that I would have confidence in, yes.

MR. BADER: And this will inform your testing program that you said that you thought would be necessary?

MR. PATTERSON: The testing program, certainly this will help, this will inform the testing program. The results of these runs will determine what testing we should be doing in order to be successful, yes.

MR. BADER: Will it also help you determine the amount of margin that you build into your calculations where there are uncertainties? Will it help to identify those uncertainties?

MR. PATTERSON: It will certainly help us determine what kind of margin we need, yes.

MR. BADER: Thank you.

CHAIRMAN: I'm going to finish up the questioning in a minute with Mr. Russo. He's a very important individual here. But before that I just want to get clear on one thing, Mr. Patterson. You talked about inputs, part of the input you're talking about is the actual waste stream that's coming from the tank

farms, right?

MR. PATTERSON: That is correct.

CHAIRMAN: And how well you know that and it has to be characterized, right?

MR. PATTERSON: That is correct.

CHAIRMAN: And that's pretty challenging, right?

MR. PATTERSON: Yes, it is.

CHAIRMAN: Okay. I'm lying to say I have the last question. You want to go before me?

VICE CHAIRMAN: I'd like to go before you if I can.

CHAIRMAN: Okay.

VICE CHAIRMAN: I wanted you to clarify for me, you said this issue is back on the plate because of new information and that the key would be at this time locking down on the inputs from the tank farm. Have the inputs changed? What's the new information?

MR. PATTERSON: It's the way we use that input. We have information from the tank farms, we have used documents like 9805 as one of those that we use to establish the inputs. We have contract parameters that we use to establish the parameters of the inputs. So we have a lot of information to establish inputs.

Now, you have to determine how you use those inputs. We, you know, for example, we have used in the

past various sizes for erosion, various particle sizes for erosion. And certainly when we started this whole process it was 11 microns was one of the things that we used for erosion calculations. Actually, it was 11 microns and we decided to double that and use 22 microns. If you really look into this you can have larger particles of course. So the decision you have to make is how large of a particle should you use in terms of your erosion calculations because erosion calculations are usually done on an average, it's not using the same large particle hitting that plate, hitting that pipe or whatever during the life of the plant. So you have to determine what particle size. And this is where the variations come in in terms of what you use and then what the uncertainty is associated with that and then how much margin you should have for that uncertainty.

CHAIRMAN: Thank you. Mr. Russo, it's been --

MR. BADER: Can I --

CHAIRMAN: No. Mr. Russo, it's been difficult to obviously solve this problem. And Mr. Patterson has talked about new information and you've had to rethink the problem. So from your point of view, what happens if you can't easily resolve this or the new plan that you have in place fails? What's the approach going to be from your perspective as the project director?

MR. RUSSO: Well, first and foremost before we ever bring waste into this facility we have to have all of these problems resolved. And to the point earlier made by Donna, it's an iterative process and design. And you want to understand your mechanical, you want to understand your mechanical systems, how they will respond. When you get them to a point where you've got that understood, if not locked down, you want to understand can the safety basis support those mechanical parameters. So some of the learnings we've had over the last several years in terms of ultrafiltration and other of our systems, is that you are now operating at temperatures that are higher than we had originally anticipated.

So when you combine that with what Tom said in terms of we also have a variability on what is an appropriate size particle that you would say is hitting that side wall and how often your wear plate and how often it is hitting it, there has to be an acknowledgement that you get that resolved technically from a point of view of what does a design look like, then you go back and look, can I keep the physical process, not being a process of paper but the chemical processing, can you keep it within the ranges that you need to keep it and can an operator operate within that

range or is there so many TSR [Technical Safety Requirements] requirements that you put the operator in a fail safe mode. Because if we learned -- or in a fail mode. Because if we've learned anything over the years with operating facilities, whether they're nuclear, chemical, anything that has pressure and/or -- or the ability to cause harm, having a mechanical system that an operator fully understands provides the kind of assurance we all want.

I, unlike Tom, since the waste stream is while well known, it's still a variable and I think it will remain a variable. As we get smarter and smarter with the various testing we're doing. There may very well be opportunities to revisit this subject again. And we have got to have both the wisdom and the willingness to revisit it if we learn something new as we go further. And it's not on any one point because if you come out of a decision in the mechanical design, this is Donna's point about being holistic, it could come out of a decision in terms of the material selection. It could come out of a decision from the tank farm.

So one of the things that when I first came to the project and met Mr. Knutson, I had in a previous life did a lot of work in chemical processing. And what you learn in that business is you need to understand your

feed stock, in our case a waste stream, at a very, very sophisticated level. You have to have that knowledge because a product to market, time to market, purity of product. And we will not have that knowledge because of the nature of the waste. So we talked about One System. We said start with the end in line. We needed to get close coupled with the tank farm.

CHAIRMAN: Let me ask you this right now. And we're going to have to move on to mixing in a moment, unless you have a very short question.

MR. BADER: I have a short question.

CHAIRMAN: Have you placed any vessels at this point that you feel you may need to change the internals or move out based upon erosion/corrosion concerns?

MR. RUSSO: We have vessels that were placed several years ago that we have a subcontract in place with CB&I [Chicago Bridge & Iron] to make modifications.

CHAIRMAN: Okay. Briefly.

MR. BADER: Mr. Patterson, you mentioned that establishing the WAC would be helpful. When do you expect to do that?

MR. PATTERSON: Okay. Certainly we have defined a WAC to date, but I think between us and the Department of Energy and the tank farms through One System that is where we will really get down to establishing the details

of the WAC [Waste Acceptance Criteria] that we really need to forward. And that's one of the reasons why we established One System such that we can work together and come up with a WAC that is reasonable as a tank farm and something that we can process in our facility with confidence. But I think through that One System organization that we will indeed establish it. Can I give you a date today? No.

MR. BADER: Mr. Russo?

MR. RUSSO: Again, looking at complexities and the layers of complexity in that question, obviously if we set a Waste Acceptance Criteria over on the tank farm side and on the WTP side of the transfer pit, we're going to have to have the ability to characterize and sample waste to make sure we're within those confines of the Waste Acceptance Criteria.

So part of the challenge on the establishment of that criteria is making sure we have the ability to actually validate that what the criteria is stated at can actually be fulfilled and measured as it goes through the transfer from the tank farm to the WTP. We have to know what we're getting. Tank farm has to be able to tell us what we're getting. And we have to know as it moves across for the reasons we talked about in the process that we're not doing anything that puts us in a out-of-

spec condition.

CHAIRMAN: Okay. Thank you. We're going to move on now to the mixing part of this discussion because we wanted to cover two topics, erosion and corrosion and mixing. So let me ask Dr. Mansfield to begin that discussion also.

DR. MANSFIELD: Thank you, Mr. Chairman. Mixing is just about the oldest issue in this project. I remember when BNFL was trying to wrestle with it in the year 2000. And a lot of progress has been made. It appears to me that the major issues now are overblows, solid accumulations, criticality issues, and computational fluid dynamics.

On computational fluid dynamics I'd like ask if -- I know you expect to be able to use computation fluid dynamics for understanding the behavior of the Newtonian tanks. What about Non-Newtonian tanks? Will computational fluid dynamics play any role at all or will it all be scaling? Mr. Brunson.

MR. BRUNSON: Based upon the information that I have seen, consultation with federal staff, consultation with National Energy Technology Laboratory, the answer to that question is no.

DR. MANSFIELD: Good. Thank you. Ms. Busche, let me talk a bit about criticality for a minute. Ms.

Busche, do we have enough information now with -- from the mixing efforts to develop the functional requirements for a criticality control program?

MS. BUSCHE: No.

DR. MANSFIELD: Okay. So this, to me this is defining the work in the future and that's why I asked such questions. I suspected the answer anyway.

And, Mr. Daniel, the test program right now or in the future, is it going to be able to support experiments that will help future criticality safety requirements be defined?

MR. DANIEL: As we're working through the definition of the testing program today, the first phase of testing we're looking at is CFD [Computational Fluid Dynamics] V&V [Verification and Validation] testing for the Newtonian vessels itself, which would provide some support to the overall evaluation for the criticality.

The second phase of testing is looking at the overall performance of the testing itself and determination of operational limits through the scale testing at four, eight and 14 foot. To support that we're currently working with Ms. Busche's staff to identify what needs she would need from a nuclear safety side so we can get those incorporated into the original test planning documents as we move forward with that

testing.

DR. MANSFIELD: Those test plans will deal with solid accumulations, solids at the bottom, things like that. And they're going to be -- you expect them to be quite definitive?

MR. DANIEL: Yes, sir.

DR. MANSFIELD: Thank you, Mr. Chairman.

CHAIRMAN: Let me just come back to you for just one second before we move on, Ms. Busche.

So criticality at one point was considered incredible for this facility, that was my understanding; is that correct? I'm going back a little ways here.

MS. BUSCHE: I would actually phrase that the criticality safety evaluation report concluded that criticality was incredible based on controls. So if you look at the integration of hazards in 3009 and 3007, those controls were needed to say criticality was incredible. The primary mechanism to do that was sampling, both on the tank farm side, and I call it to the right of the baths.

CHAIRMAN: So right now you're just having difficulty identifying a set of controls that can ensure that we do not have a criticality event; is that true?

MS. BUSCHE: Today we don't have controls in the plant that monitor the performance of solids. Where are

solids? Where are they accumulating? Are they in the pipe? We don't know. We don't have that mechanism today.

CHAIRMAN: So you're a ways from doing this, actually identifying the necessary controls to prevent criticality?

MS. BUSCHE: Correct.

CHAIRMAN: Mr. Bader.

MR. BADER: Mr. Patterson, what systems in the pretreatment facility are impacted by the unresolved technical issues related to mixing? Can you give me a feel for what you believe those systems are?

MR. PATTERSON: The primary ones are the vessels with high solids and the non-Newtonian vessels. That makes up eight of our vessels. The other 30 vessels, the total 30 vessels, some of those are in HLW, actually, four of them are in HLW, those vessels which are Newtonian vessels with low solids, really mixing is really not considered a big issue. So it is only those high solid vessels and the non-Newtonian vessels that provide us concern with respect to mixing. And that's really where we're trying to focus on those vessels in particular to ensure we have adequate mixing capability for those vessels.

MR. BADER: How about things like the air

handling system, ventilation system, PJM controls?

MR. PATTERSON: So we're talking about overblows, PJM overblows. Well, certainly PJM overblow is a concern all the way through the facility. And certainly it's something that we are focusing on heavily. We know PJM control is critical to this -- we know PJM control is critical and the various reasons. And so we're actually looking at various alternatives to provide better assurance that we can control the PJM's under all the conditions that are presented before us.

So we originally had a plan with respect to how we might controls the PJM's. We determined that that plan is very difficult. There are a lot of issues associated with it. We still plan on looking at that. But we're also looking at other potential ways to control the PJM's that will be more fool proof to ensure that we don't have the overblows. And, in fact, we have an individual within our organization that actually has come up with a very unique design, we are going to test that design. We've done it on a very small scale and it is very -- looks like very good and very promising. And we're going to do it on a larger scale as we move forward into the testing phase in LSIT.

So with that in mind provided that that goes as well as it did in the lower scale, in the small scale,

provided it goes just as well, this is something that will be a major benefit to us in terms of having a very positive basically fool proof method to ensure that we can control those PJM's adequately and prevent overblows.

MR. BADER: What about the impact on the process vent system? Do you see that as having issues related to safety?

MR. PATTERSON: Certainly the key here is -- are really overblows is one of the key things, overblows that really is driving it. The other thing that drives it are our spargers for the -- particularly the non-Newtonian vessels. So certainly that does have an impact on that system and certainly that's one of the technical issues that we've been working on resolving. And in actual fact, we're doing testing at this time to look at entrainment values to just determine what the impact of the system is, what the entrainment values really are. And that testing has been going on for several months now and it's nearing completion.

Once that testing is complete we can determine whether the system will have -- be impacted or not. Currently the testing is going on very well and we're just going to have to wait and see. I think the report is scheduled to be issued in April and then we will determine just where we are with that system.

MR. BADER: Thank you. Ms. Busche, what do you think the impact on your safety basis is of these unresolved issues that we have been discussing with Mr. Patterson?

MS. BUSCHE: Specific to Pulse Jet Mixers and the Process Vessel Vent, I will tell you today the Process Vessel Vent is a safety class system that is specifically credited to prevent detonations in the vessel. Today the design cannot perform its intended safety function. So as we resolve the mixing challenges, I think it will be directly related to closing the PVV, including any design changes that may be needed.

MR. BADER: For the bulk of the people in this room, what is the PVV?

MS. BUSCHE: The Process Vessel Vent. I'm sorry. This is the exhaust system on the vessels. So to control hydrogen detonations in the vessel we have several controls. We first force air into the head space of the vessel, we then with the Process Vessel Vent exhaust air through the vessel to maintain negative head space in the vessel and then we also use the mixing function to make sure that hydrogen is released continuously so that it doesn't overwhelm the head space.

MR. BADER: Do you have any sense of how long it is going to take to resolve these issues, either

Mr. Patterson or Ms. Busche?

MR. PATTERSON: I can start. That particular issue with respect the PVV, we are nearing conclusion with respect to the impact, for example, of overblows, entrainment from spargers, we're nearing completion on that testing. Once that testing is completed, then we can determine what the system could look like and then we can work with nuclear safety in determining if we can solve that issue and how it is going to be solved. I would suggest it is a matter of a short period of time. Certainly within the next few months. We're going to get the data, get the data now, provided that the data is positive, then all we need to do is complete the design of the system and then run it through its hazards analysis and accident analysis and set the controls.

CHAIRMAN: All right. Ms. Roberson.

VICE CHAIRMAN: Mr. Patterson, has the WTP project performed any assessments on the impact of WTP throughput as a result of the design changes for mixing?

MR. PATTERSON: We do these runs constantly. In fact, we have just recently completed another G2 run to determine the impact of any design changes we might have had to date. We do these runs at least once a year. We're just finishing one, as I say, as we speak to determine what the capacity of the plant is, to ensure

that anything that we have done doesn't impact what our requirements -- our contractual requirements are with respect to throughput. And to date we can still satisfactorily say that our throughput still meets contractual requirements under the changes that we've had so far.

VICE CHAIRMAN: And what is the requirement?

MR. PATTERSON: I think it is 70 percent, that it says 70 percent.

VICE CHAIRMAN: What assumptions were made in those runs relative to mixing?

MR. PATTERSON: There's a number of assumptions made.

VICE CHAIRMAN: What are the key assumptions? Just tell me the biggies.

MR. PATTERSON: I don't know off the top of my head. I can ask.

VICE CHAIRMAN: Well, let me ask Mr. Brunson, do you know?

MR. BRUNSON: Could you repeat the question, please?

VICE CHAIRMAN: In the most recent assessment of throughput and the assessment of the impact of design changes for mixing, what are the key assumptions that are made in concluding satisfactory --

MR. BRUNSON: To my knowledge that, you know, we have an operational readiness that we've run right now which is at 70 point some odd percent, to my knowledge, and I would have to consult with technical staff that reviews that as a deliverable from the contractor. I don't -- I am not specifically aware of any changes to that model specifically related to challenges associated with mixing.

VICE CHAIRMAN: You're not aware of what assumptions are input into that model? No is a good answer.

MR. BRUNSON: I think what you're looking for and I think the assumption within that model is that we have somewhat homogenous mixing. So, in other words, the assumptions are is that we'll be able to process from vessel to vessel, pull a representative sample for process control and then send it on down the line and based on those samples we'll know what additives to put in there, for example, to facilitate leaching.

VICE CHAIRMAN: Well, that may be one assumption. Let me just ask you in the testing program as you proceed to try to verify those assumptions, can you identify the key assumptions you're trying to verify through your testing program?

MR. BRUNSON: The key assumptions that we're

interested with respect to vessel mixing is the first is can we mix to release gas? Can we have a gaseous release? Another part of the program is that we definitively know that we accumulate some heavy particles in the bottom of the vessel. So one of the other things we want to evaluate is is that heel removal so that we can eliminate those, the solids that are in the vessel, and that's wherein I believe Ms. Busche says the criticality concern comes from.

VICE CHAIRMAN: But you have to have made some assumptions of an outcome. And you're going to --

MR. AZZARO: We're assured those are short circuits in the mics and they're going to repair that over the break. That's the best I can do now.

VICE CHAIRMAN: So, Mr. Brunson, let me just ask one last question because we do have a lot of people, lot of questions. How could the results of the mixing test program impact verification of the assumptions used to determine throughput?

MR. BRUNSON: It could result in a change to design, ma'am. If could be that the PJM configuration we have, the firing sequence, the velocity and whatnot are going to be sufficient.

CHAIRMAN: Dr. Mansfield.

DR. MANSFIELD: Thank you, Mr. Chairman. This

is an easy yes or no. Mr. Russo, isn't it true that the -- or is my assumption correct that the current unresolved status of mixing prevents finishing the final design of the pretreatment vessels and establishing controls and therefore completing the safety basis? And my question is, first all, do you agree with that?

MR. RUSSO: Yes.

DR. MANSFIELD: And can you give an idea of what kind of effort is going to be required to bring it to the point where you can complete a design and a safety basis?

MR. RUSSO: So we put together the vessel completion team, originally we started talking in terms of large scale integrated testing and that was a conversation we had a year and a half ago. But the more we look at it, we determined we have to verify not just the LSIT [Large Scale Integrated Testing], the mixing, and the ability to get solids mobilized from the bottom for criticality and for hydrogen generation so that you release the hydrogen. But we've got to look at it holistically. We got to look at the entire piping systems, we have to look at the iterations that it has both on other elements of the design and on what it does to the safety basis.

So we put together a vessel completion team, these are all dedicated people that used to have other

parts of their job that are now dedicated to vessel completion. Our commitment has been and remains that no vessel will be set until the vessel is fully validated to everyone's satisfaction that has an understanding of our processes. And that remains our commitment.

Bill Gay, which you will be speaking to shortly, is leading that team. He has put together a very thorough plan of going through working with Russ and other folks going through element by element, erosion/ corrosion, the actual adequacy of mixing, implications on the G2 model, implications on the safety basis. It will and have to iterate again. Can all the conditions that we've established that deem success within the pretreat facility, what does it do to the tank farm? Can they meet those conditions? And if the answer is yes, then we will have closure on mixing. If the answer is no, then we're going to have to go through another hydration either on the tank farm side of the flowsheet or on the WTP side of the flowsheet.

DR. MANSFIELD: Thank you, Mr. Chairman.

CHAIRMAN: Mr. Knutson, the Board obviously issued Recommendation 2010-2, I know you're quite familiar with that, you recently visited us in Washington and we talked about some progress that the Department is making on that. And I think the understanding is that

for waste that does not comply with the Waste Acceptance Criteria you may need alternative strategies. So I guess the question is right now at this time do you have any sense of what quantity of the waste in the tanks may need to be processed with alternative strategies?

MR. KNUTSON: I understand that through the One System team, Scott Samuelson is the ORP manager, he's actually working up an answer to that question. It was a commentary that we followed from 18 months ago in our last session. And I believe that the -- I believe there's at least one technical issue summary that we've published for the record in October of 2010 that talked about the process that would be used to actually come to that number. And that process is not completed yet, but I believe that it is a deliverable that is associated with the One System team's product.

CHAIRMAN: See, what I'm trying to understand a little better is if you don't fully resolve the mixing issues, how are you going to figure out eventually what the Waste Acceptance Criteria might be and what the percentage of waste is that you won't be able to process through the Waste Treatment Plant? Is that -- in your opinion is that integrally tied, that resolution of that issue to being able to go forward with those assessments?

MR. KNUTSON: It is absolutely critical to the

formulation of those assessments, but it's also an iterative solution. You can solve the issue of a Waste Acceptance Criteria by forcing a criteria backwards from the pretreatment facility into the tank farms and solve it that way or you can look at the best available knowledge in the tank farms and develop a Waste Acceptance Criteria that comes forward to the pretreatment facility. And both of those require iteration in this discussion.

CHAIRMAN: If you want to go from the Waste Treatment Plant back to the tank farms you'll have to know -- you'll have to resolve these issues with mixing in the actual plant in the vessels, right?

MR. KNUTSON: That's correct.

CHAIRMAN: You can't go that direction right now, right?

MR. KNUTSON: We can't go that direction for all parameters, you're absolutely right.

CHAIRMAN: Yeah. Do you have any sense of -- I guess another issue I want to ask you very briefly about before I get to the last question is what about sampling? How important -- I mean, we're going to go the other way now -- how important is sampling in the tank farms to be able to, you know, also address what's going to be fed into the plant?

MR. KNUTSON: Sampling has always been a key element of the prerequisites of being able to send a batch to the pretreatment facility. It is one of the -- it is a critical function.

CHAIRMAN: So based on where you are today, do you have any sense of what percentage of the waste you might need to exclude from treatment in the Waste Treatment Plant?

MR. KNUTSON: As a personal opinion I'm still personally convinced that a vast majority of the waste will need a Waste Acceptance Criteria that the pretreatment facility can treat. As we learn more about the specific physical parameters that it takes to be able to satisfy that criteria, we have a tremendous team of individuals that are both from tank farms and from the Waste Treatment Plant that are working on how do you translate that into specific physical parameters?

CHAIRMAN: Are there a set of tanks in the tank farms right now that you feel you won't be able to process in the Waste Treatment Plant? I'm obviously referring to the plants which have the large plutonium particles in them, the plutonium finishing plant.

MR. KNUTSON: Yes. And I think it's important that we refer back to a fundamental DOE policy statement that was put in place in 2003 that had identified that

these high fissile content tanks would be satisfied and would need to have an alternative methodology as early as 2003 in the discussion.

CHAIRMAN: Well, I don't want to leave Mr. Gay out of this thing. And you look a little disappointed. So let me see if I can come up with something your way.

One of the things about mixing that is really challenging, at least from the way I understand it, is being able to mix these non-Newtonian vessels. And we have seen some testing, you've seen some testing. One of the things that the project was trying to do is prove the premise that the performance of the Newtonian vessels would basically bound the nonNewtonian vessels. Where are you right now in that process in terms of being able to do that and being able to prove out mixing of the non-Newtonian vessels?

MR. GAY: There's an IP deliverable, I think it's August of 2012, October of 2012, where we have to report to you whether Newtonian will bound non-Newtonian or not. I think Frank is ready to say that we will not be pursuing Newtonian bounding non-Newtonian. We do not believe that that's an appropriate approach. We believe scaling is the appropriate approach.

In the 14-foot platform we will essentially have a full scale nonNewtonian vessel with UFPZ. So we'll be

doing full scale testing with UPFZ. That only leaves three other tanks, which are the lag storage vessels, HLP27A and B and 28 and they're about 28 foot -- they're 28 foot in diameter. So we will be -- we could do half scale with those vessels for scaling. But we are also making sure as we build the 14-foot platform infrastructure that we have capacity such that we could do a full scale HLP27A or B or 28, if that's the way we think we ought to go for those three lag storage vessels. They're reasonably large, they carry about 80,000 gallons apiece.

Now, there's another thing that's going on, this is somewhat complex that we are looking at erosion/corrosion issues UFP2 vessels. And they may not pass the litmus test and we're -- as a result of that it leads to a trade study that we may be doing that Frank is sponsoring where we if we have to change out some vessels we may go with a different type vessel for HLP27A and B. And that's being evaluated. And I think Frank is leaning towards using UFP2's, which means we'll have done full scale testing on all the non-Newtonian vessels.

So I think the good news is that we're definitely going to do full scale testing on UFP2A and B, that's a done deal, it's going to be designed into the 14-foot platform. And then the three 80,000-gallon

vessels, we have to decide whether half scale is good enough or we're going to need to do full scale. And that decision hasn't been made yet.

CHAIRMAN: So you're saying you're a ways out from being able to place any non-Newtonian vessels into that facility?

MR. GAY: That's correct, sir.

CHAIRMAN: And the timeframe for that would be what?

MR. GAY: The key is the design verification from my standpoint. I have an agreement with the government that design verification will be done on the vessels before any of those 11 -- those are the non-Newtonian's, five of them -- before any of those go into the plant. And because of my background, the design verification to me means testing is done, erosion/corrosion is resolved with design margin clearly identified, nuclear safety is in agreement that they have the information such that they can write the DSA, and when all of those issues are resolved plus we have verified the quality of the fabrication, which is another requirement I have with Gary, at that time we'll start putting vessels in the plant. So we're not going to be placing vessels any time soon. We have a lot of work to do before we put any more vessels in the plant.

CHAIRMAN: So let me finish up this part of the panel with you, Mr. Brunson. You're the director of engineering for the DOE, how big a challenge do you think these non-Newtonian vessels are? Being able to figure this thing out. Let met ask, is it your sense that testing will be what's required to do this as opposed to any modeling computation of any fluid dynamics codes?

MR. BRUNSON: Yes, sir. I'm a Missourian. Show me.

CHAIRMAN: And the challenge itself, any sense of how difficult it's going to be to resolve these issues?

MR. BRUNSON: I think it's going to be a tremendous challenge because one of the things that we haven't addressed yet in the non-Newtonian vessels is that we have in essence a chandelier assembly and we haven't addressed the ability to remove solids from the top of the chandelier yet. So yeah, there are many challenges that remain, sir.

CHAIRMAN: All right. And I lied. Dr. Mansfield has one final question.

MR. BADER: I have one.

CHAIRMAN: Excuse me, Mr. Bader has a question.

MR. BADER: Mr. Gay, you made the comment it will be a different kind of vessel. Could you be more

specific as to what you think that would be?

MR. GAY: If you look at UFP2 because of the caustic stress corrosion cracking, we may have to go to Hastelloy instead of a stainless version. And there are also some concerns about that some corrosion problems with 80,000 HLP27 A and B vessels and 28 vessels.

MR. BADER: You're saying all those are candidates for being changed to Hastelloy?

MR. GAY: Candidate after we do the erosion/corrosion evaluation. I think the thing that's important to me is we keep going back and having to revisit erosion and corrosion. And this is the first time I have done this, but I'm kind of interested as we do it this time is to figure out why can't get it right by process because we're going to be able -- we're going to need to be able to do this as a routine nature based on new batches coming over from the tank farm, we have to verify that the vessels will be okay from an erosion/corrosion standpoint.

And the good thing from that is that we have to provide the government a vessel assessment integrity plan which specifically will be the processes that are being used to ensure over the lifetime of the plant that the stuff that goes into the vessels will not affect the margin for erosion and corrosion.

As we do it this time, Gary and I are both very interested in seeing how we can make the process more robust so that when something design changes one of the assumptions or one of the design impetuses to the vessel from an erosion/corrosion standpoint is let's evaluate on the front end, that's quite a process.

MR. BADER: Have you looked recently at the availability of significant quantities of Hastelloy for vessels?

MR. GAY: No, I haven't done that. It is probably hard to come by. I know it is expensive.

CHAIRMAN: Did you want the final word, Mr. Russo?

MR. RUSSO: I was just going to add a point because it goes back to our earlier conversation when I asked for the trade study, when I asked our team to get together and put together a trade study team. It was with the understanding that when you look at it holistically. Are we going to be able to manage process batch to batch so that there are no questions for any of us? And if the answer to that is no in trade what would be an appropriate option that you can put within the physical zones that now exist? And the trade study team has come up with a series of options that they're now evaluating and iterating. But it will still have to be

compared and evaluated against can you control the process without creating impossibility for the operator so you don't have to make that trade. And that work will be completed within the next four to six months.

CHAIRMAN: So we've been discussing here today these unresolved technical issues, they've been around for awhile. Talked about the fact that there are -- seem to be surprises all the time about what's necessary to resolve these. A lot more work ahead to be able to do that. And we've talked about some of the challenges that your organization has in developing a safety basis for all these moving parts. Until they fix this design and you can say I can put a set of controls in place to address hazards, we won't have a safety basis; is that true?

MS. BUSCHE: That is correct.

CHAIRMAN: Okay. Let me thank this panel. Let me do it appropriately. Mr. Knutson, Mr. Brunson, Mr. Russo, Mr. Patterson, Ms. Busche, Mr. Gay and Mr. Daniel, thanks a lot.

And we're going to call the second panel. Now from the Department of Energy and its contractor organizations for the topic of this panel, the session, will be development of the documented safety analysis. We'd like to invite up Mr. Matthew Moury, DOE's

Environmental Management Deputy Assistant Secretary for Safety, Security and Quality Programs; Mr. Scott Samuelson, DOE's Manager of the Office of River Protection; Mr. Dale Knutson, DOE's Federal Project Director for the Waste Treatment Plant; Mr. Paul Harrington, DOE's Assistant Manager of Engineering and Nuclear Safety for the Office of River Protection; Mr. Gary Brunson, DOE's Director of the Engineering Division for the Waste Treatment Plant; Dr. Fred Beranek, the Waste Treatment Plant Manager of Nuclear Safety and Plant Engineering; Mr. Thomas Patterson, the Waste Treatment Plant Manager of Engineering; Ms. Donna Busche, The Waste Treatment Plant Manager of Environmental and Nuclear Safety.

The Board will either direct questions to the panel or individual panelists who will answer them to the best of their ability. After that initial answer, other panelists may seek recognition by the Chair to supplement the answer as necessary. If panelists would like to take a question for the record that answer -- the answer to that question will be entered into the record of this hearing at a later time.

Does anyone on the panel wish to submit written testimony at this time? Seeing none, we'll go on. I'd like to thank each of you for your testimonies today.

With that we'll continue with questions from the board members to the panel. I believe we'll begin with Ms. Roberson.

VICE CHAIRMAN: Mr. Chairman, I'm going to defer to Dr. Mansfield.

CHAIRMAN: Dr. Mansfield.

DR. MANSFIELD: Thank you, Mr. Chairman. Mr. Brunson, my question is about the process ventilation pipe installation and its surveillance of the last year about that issue. Obviously surprising, I'm sure you too as it was to us, that the piping installed was not in accordance with the -- I'm asking about the October 2011 DOE surveillance report that BNI installed pretreatment facility vessel advance process piping in Area that was not in accordance with the preliminary documented safety analysis. It led to -- that surveillance led to BNI issuing some management suspensions of work. That's a, I'd say, terrible outcome in just about every case. Do you believe that problem is fixed or do you think you might have other ones pop up? It is really a question for DOE because you're the ones that are doing the surveillances.

MR. BRUNSON: I don't definitely know that we won't place another item. I know that we have put processes in place to prevent that management suspension

of work. So those processes are in place. I have not seen an extent of condition performed to assess whether we've got any other potentials or have. So I believe that we've got processes in place to mitigate that risk.

DR. MANSFIELD: Are there industry-wide processes to avoid problems like this? I imagine people don't have probably preliminary documented safety analysis but they have other operational requirements that leads them not to want material to be installed before the design is verified. Are there ways in this industry to keep an eye on this? I mean, is there --

MR. BRUNSON: Well, my experience all comes from naval reactors, so in that program it's a very mature program, it's been around for 60 years. I had never seen a system or component placed where it was not intended to be placed with respect to design.

DR. MANSFIELD: So they're always doing it right?

MR. BRUNSON: Yes, sir.

DR. MANSFIELD: Thank you, Mr. Chairman. There is one more that I could ask you. Is there these -- when you have this kind of inconsistency between the safety basis and design in that involve suspension of work, how does the Department resolve these differences between safety and design to allow the project to move forward?

What I mean by that is, do you stop dead or can you continue with design holding the construction or do you consider the construction -- hold the construction while you work on the -- you know, there's all sorts of ways you can think of addressing the issue of the diversions between the preliminary document safety analysis and the design. Do you have a preferred way of doing that when they diverge?

MR. KNUTSON: So I'll answer on behalf of the federal project team. The answer is that you stop those activities that have the potential to not be in accordance with the authorization basis. We also have to recognize that there's a very broad spectrum of maturity associated with the Waste Treatment Plant project. We've spent a lot of time talking about the pretreatment facility but we also have four other facilities, all of which are at varying levels of completion, all of which at varying levels of sophistication, both in their understanding of the design and of their ability to remain latched up with the authorization basis. The pretreatment facility is the least mature of any of those facilities. The LBL facilities are the most mature of any of those facilities. And the LBL facilities transition to a commissioning and startup phase starting this year. So the 12-facility infrastructure buildings

and two category 3 nuclear facilities are part of the most mature elements of the project.

The expectation is that any time that there's a disconnect between an engineered system and the documented safety analysis that that work is -- there's not even a question of whether or not that work is stopped, the work is stopped, and that's the management suspension of work process.

DR. MANSFIELD: Thank you, Mr. Chairman.

CHAIRMAN: Ms. Roberson.

VICE CHAIRMAN: Thank you, Mr. Chairman. Ms. Busche, we talked a little bit about this in the last session, but in context, you know, there have been a number of the DOE assessments, defense board staff reviews, project team reviews, entries into BNI's corrective action management system that have identified misalignments between the WTP design and the safety -- the current safety basis. In just a few words, I know we talked about the PVP system, can you describe generally what does a misalignment mean?

MS. BUSCHE: A misalignment can be any range of things from the description in the safety document doesn't -- isn't aligned with the design. It could actually in some cases be where the safety basis itself is inconsistent in describing a requirement, so it's

transposed in the safety documents. So we use it at a higher level to -- it can be any broad range of, you know, potential non -- you know, misalignments.

VICE CHAIRMAN: So we talked a little earlier about the process vessel vent system and I take -- I think Mr. Knutson just made a good point. Do you have misalignments in the safety basis and design of other facilities that are part of the plant?

MS. BUSCHE: In other facilities?

VICE CHAIRMAN: Yes.

MS. BUSCHE: Yes.

VICE CHAIRMAN: What are some examples of those?

MS. BUSCHE: The -- very related to the process vessel vent in the pretreat it has a specific safety function to prevent hydrogen detonations. In the high-level waste facility we also have somewhat of a misalignment or a technical issue because the current -- the C5, the confinement ventilation system currently cannot, may not be able to handle the entrained solids on the mixing side. So that is one where we have a -- the preliminary documented and safety analysis hasn't really been completely updated. So it is an apparent misalignment but we know it is there.

VICE CHAIRMAN: And do you consider these misalignments serious or minor as you reconstitute or

re-baseline your safety basis? Are these serious misalignments?

MS. BUSCHE: There are some that are very serious. When we have a credited safety system that can't perform its function or the design wasn't -- doesn't meet the credited safety function, I view those as serious in my world. There are others that it is not as serious. But in the nuclear business you comply with your safety basis document. So I think with discipline this management stop of work or suspension of work, that's what it's focused on doing. First stop, then look at what can you start back in a disciplined process.

VICE CHAIRMAN: Thank you.

CHAIRMAN: Before we move on, are you surprised that a project that's this far along in design and construction has this type of a misalignment right now between its design and its safety basis?

MS. BUSCHE: I'm not surprised on any design construct project that you will have misalignments because of the iterative nature. I am very, very surprised at the nature of some of these misalignments and the significance level that they are.

CHAIRMAN: Can you give an example of one that really surprises you?

MS. BUSCHE: The process vessel vent is the one

probably most prominent in my mind that I have been an advocate for is that it's a safety class system. So when we have a design that's installed that doesn't meet its credited safety functions and we now have to come up with other design solutions because portions are installed, it makes my job and my function more difficult.

CHAIRMAN: So is the situation that led to that, has that been corrected? I mean, are you not expecting to see that kind of a situation going forward where there's a significant misalignment between the preliminary document safety analysis and design? Have systems been -- have people learned from that so that it's not going to happen again?

MS. BUSCHE: We've recently issued a root cause analysis report and judgement and need. So I would answer that twofold. In going forward we will be fixing our processes to make sure we understand. If there's a change in the safety basis, what's the impact to the existing design, ongoing design, and that's big for a project that outsources a large portion of their work. So going forward I believe we have I think the right alignment both in my procedures and Tom's procedures in engineering going forward. The difficulty when we do this -- the safety basis reconstitution by definition we're going to identify some more. The same process

will, you know, will trickle down into all the facilities. So I think that with cautious optimism as we move forward that we won't find any more significant items.

CHAIRMAN: So hopefully you've got the process under control but that doesn't negate the fact that if there are unresolved technical issues, it's going to very hard to do your job.

MS. BUSCH: That further compounds it.

CHAIRMAN: Yeah. Absolutely. Mr. Bader.

MR. BADER: I think you asked most of the questions I was going to ask. But let me -- the one thing that I did want to ask Ms. Busche is when you've got this kind of a misalignment, does that compound the problems you've had with your hazards analysis?

MS. BUSCHE: Absolutely.

MR. BADER: I mean, I would think that's a one for one.

MS. BUSCHE: It is sometimes a twofer. Depending on what the issue is because of the interrelationship of these systems and the hazards and the control strategies that we need, if there's a misalignment on the process vessel vent, I now have questions on what's the right mixing schedule to make sure I either don't overwhelm the process vessel vent.

So depending on what analysis, either hazards analysis or accident analysis, is going on, every time there's a misalignment, it's almost a -- you have to look at what's going on in place to understand those interrelationships.

MR. BADER: Thank you.

CHAIRMAN: My apologies. The question I would ask you is: What factors specifically contributed to the need to reconstitute the safety basis?

MS. BUSCHE: I have seen probably since I suspended some of the integrated safety management process, I've done a management assessment, I led or requested a management assessment of the low-activity waste, we found numerous issues with what I would say the adequacy and the discipline by which the nuclear safety professionals documented that hazards analysis, the retrievability of records, the traceability to design.

So when you then do spot checks on other facilities and you see similar types of issues it -- I get to the point when I look at the pretreatment facility the information in the preliminary documented safety analysis has not been updated for many years, approximately six for mixing. So if nuclear safety isn't updating what's needed in the safety basis, by definition they're not communicating to engineering what nuclear safety will ultimately need in the control strategy. So

it's -- if the information's not there, I made that decision because I believe I was obligated to make sure we have the proper safety basis for ultimately to get it into the design and then have a control strategy to mitigate those hazards.

CHAIRMAN: So how much time and effort is going to be required to reconstitute the safety basis? Is this a major undertaking?

MS. BUSCHE: Absolutely. I would suspect that right now just some preliminary planning that we're doing, we're going to have to have a interdisciplinary team, not just nuclear safety professionals, engineers and operations staff will have to be involved. I would suspect that at least on the nuclear safety side you can talk about 15 to 20 people full time doing the hazards analysis, doing the accident analysis. Similarly, we'll need support from every engineering discipline when we get to that point in the system. So it is significant. And I would gander it is probably a good year effort. And that's with no new issues.

CHAIRMAN: So let me ask you, Mr. Samuelson, you're the gentleman whose I guess going to write the license with Mr. Harrington for this facility, right? So this is kind of your baby.

MR. SAMUELSON: Yes, sir.

CHAIRMAN: And what's your perspective of the challenges that the project faces in terms of actually being able to resolve some of these issues and reconstitute the safety basis? Are you disappointed that this is the situation that you're in at this point?

MR. SAMUELSON: I think the approach that I have to take is to make sure that we are looking at where we were now and doing everything we can to make sure that we understand the condition that we are and what we have to do to move forward. So as someone fairly new to the endeavor, I can honestly say that I wish we were further along, but I think that certainly in the almost a year since I have started here I have seen us become much more engaged in open discussion of these types of things and what it is we need to do about them and how we are going to move them to where we want them to be. And so I am actually encouraged that we are going some place that we need to go. I wish that we were further down that journey than we are.

CHAIRMAN: Well, it concerns me a little bit and I would also ask Mr. Harrington to help out, this is a facility that's under construction, there are vessels being placed in this facility all the time. I mean, it would seem to me that it would be tremendous concern that these -- that this safety basis has not been kept along

and brought along at the same pace as the construction issues have and that you don't have a lot more confidence at this stage that you can in the end end up with a defensible safety basis. I mean, do you share that concern?

MR. SAMUELSON: I'll ask Paul to join in on this. I would say I am very concerned that we get to where we need to be. Right now, particularly in pretreat, we are not installing much at all. And we have exercised the management suspension work process, we have stopped the things where we understood there to be problems.

As you heard from the previous panel, the vessels where we have questions aren't going any place until we understand what they need to be and whether they can meet their functions in accordance with the safety analysis and their process function. And that's going to take a while, which is going to be what it has to be to get us where we need to go. We have no other choice. We have to do it right.

MR. HARRINGTON: I think the governing requirement here is NQA-1 requirement three on design control. And that requires that the design organization share the design with all the affected organizations, that they get approval from those affected organizations

and that the same process applies to any proposed design change. I think we have been less than rigorous in application of that requirement and that has led to the observed deltas between nuclear safety and design, between construction and design and that's one of the things that we're working with BNI to do a better job of.

Ms. Busche had shared awhile ago when we were first talking about the design basis reconstitution effort her need to get with the design organization to assure herself that she had the correct design as the basis to use for that reconstitution process, absolutely, but that really is not the way it should work. It should be from the design organization to nuclear safety, to operations, to construction, to maintenance. And we simply need to do a better job of that than we have been doing.

CHAIRMAN: So you're very experienced in this business. You understand this stuff extremely well. What were the lessons you learned? Why did it happen that you're in the situation where you're in today right now? You said less than rigorous and --

MR. HARRINGTON: Yeah. Yes, I did. Having been here a year and a half now focused on the nuclear safety side rather than the design side, I cannot really speak to the historical nature, the historical activities that

got us to the position that we're in. But I certainly can speak to what we need to do to get out of that and preclude its repetition.

CHAIRMAN: Okay. Thank you. Dr. Mansfield.

DR. MANSFIELD: Thank you, Mr. Chairman. This is a pretty simple question. We noticed that there are misalignments in low-activity waste and the laboratory facilities and the balance of facilities that require the preliminary documented safety analysis to be re-baselined. This is, I imagine, the same kind of effort we were talking about in the last few questions when there are disconnections or misalignments. Is this as complex a problem in these other facilities as it is going to be in pretreatment?

MR. BUSCHE: No. No. The low-activity waste management assessment that we completed, we do have a pretty fair understanding of what is needed. I would actually almost use the term confirmatory hazards analysis because many things were done with model cuts, for example, so the teams have actually already started physically walking down the facility, an interdisciplinary team. So yes, there are technical issues associated with the safety basis, but we don't see the broad disconnect. But on the low-activity waste there's no research going on. So I think that's the

compounding factor.

DR. MANSFIELD: In that case it was part of your execution plan to, as you say, walk the plant down. Would walking the plant down more systematically help in pretreatment as well?

MS. BUSCHE: It would, but so much of the system doesn't exist today there's nothing to walk down.

DR. MANSFIELD: Okay. My last -- I have two more questions, actually. Mr. Harrington, these unresolved issues and misalignments really seems to me to impact your ability to implement the licensing strategy. Is that going to be a big issue? I mean, are we -- are you going to be -- are we going to run to the end of the WTP construction and not be able to put together a licensable facility?

MR. HARRINGTON: Before continuing appreciable construction in these areas of question, they'll have to be resolved. So no, I really don't anticipate that we'll get to the end and not have an answer. We need to resolve those issues that were discussed in the earlier session before we're able to define the design solutions that will come out of that and then have Ms. Busche's folks do the corresponding safety analysis.

DR. MANSFIELD: Mr. Moury, is that your view too? That's all I have .

MR. MOURY: Yes.

CHAIRMAN: Well, let's just -- I'm going to turn it over to Mr. Bader in a second. But Mr. Moury, once again we never like to leave panelists off. Can you give us headquarters perspective on this? I know we've heard a lot of commitment from Mr. Samuelson and Mr. Harrington. Can you give us your thoughts on this?

MR. MOURY: Yeah. I think it's actually a combination of both what Mr. Samuelson and Mr. Knutson had said before. We wish this misalignment didn't occur. All right. But we are where we are. So we're looking for our path forward. If there is a misalignment, if there's a mismatch between the design and safety basis, as Mr. Knutson said, we will stop before we proceed. I think what the Board should be encouraged by is the fact that you've got a group of panel members up here who are communicating the issues, not candy coating them, telling you how difficult this is going to be, but also laying out the path forward. So that, from a headquarters', perspective is what we're looking for and what we are working with the team to make sure is put in place.

CHAIRMAN: Ms. Roberson.

VICE CHAIRMAN: I think the only question I asked, and I appreciate your comments, Mr. Moury. I think it is important to be able to focus on a path

forward, honestly. I think it is important, though, for one to know the update that got them to a spot to ensure that they don't end up on that path again. So I would still say, ask the question of and probably you Mr. Samuelson or Mr. Knutson, what are -- what is DOE doing to ensure that progress forward does not find you with similar issues that you're faced with now?

MR. KNUTSON: I think I'd like to begin. First and foremost, the most recent surveillance that we've issued changes the paradigm at the way we look at surveillances. For so much of our history we have taken individual technical topics and parsed them into technical solutions and then refined that technical surveillance and then refined it again and refined it again. Erosion and corrosion is a classic example of that. 28 reports, multiple iterations, further refinement of a known technical issue. And it takes a very long time to drive issues to closure. You can compound that across multiple types of surveillances, across multiple systems that the Department of Energy has evaluated over the years.

The most recent surveillance that we issued has asked our contractors at Bechtel to step back and look at the systems that you're talking about from an integrated management perspective and see if there isn't a better

way of dealing with the processes of technical solutions that allows us to answer the questions based on the integrated outcomes as opposed to discrete technical solutions. And I think that's something we have to train our stakeholders in as well as ourselves.

For 10 years it's been very very easy to simply pick a technical topic and grill it to death. We need to find ways to be able to identify technical topics and the causal relationships between them as solutions are developed. And that's actually one of the issues that became paramount as this transition to commissioning and startup really began to take hold inside this project team; the need to go from component focused technical issue resolution to integrated systems, the One System. My very first meeting with you we introduced this topic and continued to push this integrated management approach that allows us to stop parsing technical solutions and start integrating technical solutions.

CHAIRMAN: Mr. Bader.

MR. BADER: Ms. Busche, let me continue along the same types of questions and just go to the issue of technical safety requirements. Is this mismatch between information to you and what you're able to do, does that compromise your ability to also come up with the proper technical safety requirements?

MS. BUSCHE: It will have a contribution to the technical safety requirements. I think the bigger issue with technical safety requirements is the reconstitution effort with hazards analysis and making sure we actually have controls so that we can write technical safety requirements.

MR. BADER: Let's go to -- I've got to be careful, I was about to say PIER and I don't like to use acronyms that are "inside baseball" acronyms. The Project Issues Evaluation Report 11-1178, the root cause analysis team identified the lack of collaborative interaction between yourselves and engineering organizations as a significant contributor to the misalignment between the design and the safety basis.

Given the finding in this Project Issues Evaluation Report, can you discuss the effectiveness of the integrated safety management process and the reasons that those integrated safety management meetings were suspended in November of 2010 and the impact of that suspension on the integration of safety into the design?

MS. BUSCHE: That was a multi-faceted question.

MR. BADER: That was a multiple question.

MS. BUSCHE: The first part of the question, as I understand it, is directly related to that recent root cause analysis that we did that was really focused on a

set of those problem identification reports that were known misalignments.

My understanding from many interviews that I had with the team is that collaborative effort focus of that particular -- those statements were really geared towards two extremes. This is a tough project. When there's a technical issue you either have folks that are going to actively confront those and work to solve them or in many cases choose not to have the discussion. So on some of our technical issues that have been around for a very, very, very long time, ash fall, flooding, they were choosing not to have the discussion. So there wasn't that collaborative, that shared vision, what do we have to do to get on with it to understand the hazards in the design. So that is something that Tom and I work on once a week on very focused sessions to make sure we're doing the leadership, you know, activities necessary to lead the organizations that if -- neither one's going anywhere without the other one. And that's a difficult part of the human dynamic.

On the integrated safety management, my decision to shut that down or stop that or suspend that was -- I had a lot of input. I had clearly feedback from my customers, Paul Harrington and his staff, the quality of documents being submitted to me that were an output of

that process, feedback from the site representatives from the Defense Nuclear Facilities Safety Board, and then direct observations.

So when you start to get that you actually start walking around and you see that. And to be candid, the quality of work being produced by the nuclear safety professionals was unacceptable. They clearly weren't doing what I consider nuclear safety work. So I chose to stand down that activity. I was actually out of town at the time when I did it. But it gets to the point if we're not going to do quality in, you can't review it in at the back end. So I stood it down. When I got back we had a series of meetings and understanding of what's your job, what's the expectations, what do you need from engineering trying to actually improve the human performance side of that activity. So as we have progressed from November 2010 to date, I will say in some instances we've got some very good examples to where now the nuclear safety professionals are working with engineering when we did -- reconstituted the hazards analysis for CXP, which is a system, I think they worked very well with discipline produced a hazards analysis report, and I'm very comfortable at this iteration nuclear safety's been integrated into that design. So we are trying to now mimic, mirror, and actually play that

forward to all the other integrated safety management teams. So it's hard. It's changing I think behavior, understanding, expectations so that you have to have the discussion, you have to have the tough conversations or we're just not going to solve the problem. (Applause.)

MR. BADER: How do you follow that up? Mr. Patterson, do you concur in what Ms. Busche said? Are you comfortable with that discussion?

MR. PATTERSON: I'm very comfortable with it. Yes, sir.

MR. BADER: Do you feel you're making progress?

MR. PATTERSON: Most definitely.

MR. BADER: Thank you. Dr. Beranek, we don't want to ignore your input.

DR. BERANEK: Feel free. (Laughter.)

MR. BADER: The root cause analysis on the design and safety basis misalignments recommends that senior project management should ensure a mechanism exists to integrate the efforts of engineering in the nuclear safety organizations. How do you feel the project will implement this recommendation?

DR. BERANEK: I think what we'll be doing, in particular one of the meetings I started up recently was a meeting between myself, plant, engineering, and I'll include output operations in that also, is now whether

we're heading more toward commissioning. Starting a meeting between the senior management and all those organizations on a biweekly basis to discuss the issues as sometimes I'll say fester for awhile at the working levels and raise that up. And we'll also be doing assessments on how the interaction is going. We have a pretty robust assessment program on the project and assessments will be done on these interactions on these meetings to make sure that interface continues.

MR. BADER: Are you comfortable with the progress?

DR. BERANEK: Of what?

MR. BADER: The interactions.

DR. BERANEK: It's come a long way, yes. And I've been back on the project for six months. As you know, I started out here 2001. I can probably help provide a little historical perspective on the issues. But in the months I have been here I have seen -- again, not knowing the -- what's been going on the last two or three years, I see good interaction. I see meetings. I see the usual tension. I have been in this business a long time both on the site engineering side and on the nuclear safety side and operating facilities I have been around for years. There's always tension between nuclear safety and engineering. It's a constructive tension. I

see that but I also see issues now getting resolved and being discussed and raised to levels to get resolved.

MR. BADER: All of these questions to me begs a question to Mr. Knutson. When I look at what we have heard this afternoon, the impact on engineering, the impact on nuclear safety, on the work in pretreatment facility that, in effect, the impact of trying to deal with the unknown or with the unanswered technical issues, the impact of the re-baselining, and in listening to some of the words that Mr. Harrington and Mr. Samuelson have used and Ms. Busche have used, I get a sense that there is a de facto slowdown on the design and construction of the pretreatment facility. Is that a sense that's correct?

MR. KNUTSON: I believe the Department of Energy has actually published that as basic policy in both its FY12 and FY13 budget submittals that said based on the priorities that we've established, the pretreatment facility is the fourth priority of four that are critically important to us. The very first one being resolution of technical issues, the second being -- by the way resolution of technical issues includes 2010-2 and the testing that goes with that.

The second priority being the LBL facilities and making sure that that capability is maintained in

accordance with its baseline commitments.

The third priority is the high-level waste facility.

And the fourth priority is the pretreatment facility.

MR. BADER: But that's fourth priority, does that mean that this is catchup situation to allow all these different issues to be resolved successfully? Is that the sense I should get from that?

MR. KNUTSON: I don't think that you should take it in terms of a premise of a catchup situation. What we have is a situation in which the funding request that was necessary to be able to maintain the pace we were on is not realistic in this environment, it's not realistic at all in this environment. And, therefore, making adjustments as part of an integrated program outcome requires us to make sure we can deal with the most important things first, which are technical issues, and those would be the same priorities that we would have set with a more robust budget.

MR. BADER: And the re-baseline.

MR. KNUTSON: And the re-baseline, yes.

MR. BADER: Thank you.

CHAIRMAN: Dr. Mansfield.

DR. MANSFIELD: Just a short question. Mr.

Patterson, because of this misalignment and the suspension of some of the work, do you think it was any lasting damage? I mean, did a lot of engineering work become useless or was this something you could fix and bring into alignment with the more or less corrective measures rather than abandonment of previous work?

MR. PATTERSON: Based on what we've seen so far very little engineering becomes useless. I mean, the engineering that we have done so far is still appropriate. Many of the studies that we're doing to determine our system basis are still appropriate. So I would suggest that there's very little engineering that would have to be redone at this point in time.

DR. MANSFIELD: That's just the answers I wanted, Mr. Chairman. This was a serious issue but not disastrous. I think that's the kind of answer that I needed. Thanks very much.

CHAIRMAN: Well, I think we have heard discussion here today, which is very good that now the nuclear safety organization, the engineering organization are working better together to come up with a defensible safety basis, there's a better process in place. But I want to get back to the Board's earlier discussion about mixing. I'm looking to you, Ms. Busche. I understand in terms of the Recommendation 10-1 that there's something like 99

technical issues that still need to be resolved associated with mixing. Is that statement true?

MS. BUSCHE: Yes, that was in our response to 5731, correct.

CHAIRMAN: How you doing on that?

MS. BUSCHE: Well, actually, as part of our reconstituting the hazards analysis we're actually looking at when we give -- we actually owe a, you know, the plan as scheduled to actually do that. We're looking at those known technical issues in conjunction with other, you know, what I'll consider disconnects in the PDSA that aren't on that list. And we're actually trying to put together the plan. So most of those there are no hazards analysis ongoing to resolve those known technical issues per se.

CHAIRMAN: So there's a ways to go here?

MS. BUSCHE: Yes, sir.

CHAIRMAN: I have a final set of questions but let me first just ask a question of your testimony, Mr. Samuelson. We do read these things carefully. And I've heard this many times about the project, this iterative process that the project uses, but this is a design build project, I mean you are constructing things in the field. These other processes don't have much value once vessels are being placed, right? I mean, because the iterative

part of the process means ripping internals out, ripping vessels out and doing some very, very costly and difficult things, right?

MR. SAMUELSON: We would prefer not to have to go to rework if we could avoid it. Absolutely.

CHAIRMAN: So iterative is kind of nice early in the process, but once things begin to mature and the design advances, a significant amount of construction is taking place, it is no longer really very useful to be iterative in terms of what you're doing.

MR. SAMUELSON: I think that there's always some amount of iteration required whether it is design build or any other project process. As we learn we have to accept what we now understand, evaluate where our design and our construction is, evaluate where we are based on that knowledge and make sure that we are comfortable that we are building the right thing as we go forward. And we can't -- we do not have the luxury of saying, well, we're really too far down the road to worry about that. That's not acceptable. We have to -- we have to act based on our best knowledge of conditions that we have at the time.

I absolutely agree that we are now at the point where we must be driving these things to convergence and rather rapidly. And that is what we are attempting to

do. And I think that's why we're seeing some of these things come out now because they were running in parallel paths and now we're driving them together.

CHAIRMAN: Let me just kind of end this discussion. I'll always go to you, Mr. Knutson, you're the project director here. Any more thoughts you want to share with us in terms of the challenges you face in terms of what we discussed here today? I mean, you have had -- the project has had a difficult tension, which has been noticed in a lot of different places between the safety organization and the engineer organization, progress seems to have been made in that regard. This led to a misalignment of the safety basis, but you feel right now you're on the right path, you're moving forward and the project now has the assistance in place it needs to begin to close the gaps and address these issues.

MR. KNUTSON: So let me take us back to where we were the last time we met in which at that point I'd been on this project exactly three months and four days. And in that timeframe what we had concluded was that there were a series of very important commitments that needed to be made that were documented in the technical issue summaries that established some very strategic outcomes that we needed to make serious progress on to be able to say the answer to the question is yes, we have got the

processes in place. The first was to make sure that we committed to a vessel completion team. This three-phase strategy of ensuring how we implement the verification of design products for incoming vessels and for vessels that have already been installed. That vessel completion team is in place.

The second thing was to make sure that nuclear safety and the engineering organizations literally converged in their technical approaches for -- necessary to complete DSA development and finalize design. And I have to say that for the last year and a half we have had to work that issue harder than any other issue on this project. Today I can say based on our conversations today and as we've testified, I'm very satisfied that the progress has moved in the right direction and that people have the right mindset for how to drive it home.

And the third thing that I wanted to make sure I left you with was my closing remarks from 18 months ago, which is we spend a lot of time talking about pretreatment facility. And the pretreatment facility in and of itself is a worthy topic of discussion, there's a lot of things to talk about there. But it's not the end of the Waste Treatment Plant project. More than 80 percent of the footprint of that site starts to transition to commissioning and startup beginning at the

end of 2012 and into 2013. And for the next three years the LBL facility infrastructure is going through the processes of startup and commissioning of the basic infrastructure of a nuclear complex and two Category-3 nuclear facilities. That was the message associated with pivot, it wasn't directed at the pretreatment facility, it was directed at what does this project team have to be able to do to say that it can get to a status of commissioning. One of the outcomes of having done that of course is the fact that we have identified serious weaknesses in other areas of the project, and we need to correct those. I think we've taken the steps that are necessary to be able to drive those corrections into place and keep them in place for the long run.

CHAIRMAN: Thank you very much. Mr. Brunson, before we say good-bye to you, we talked about erosion and corrosion today, we talked about mixing. What else keeps you awake at night in terms of technical challenges facing on this project? (Laughter.)

MR. BRUNSON: I was going to say establishing design margin, safety margin and verifying that I have a robust margin. And as Mr. Gay and me had discussed, he was a former ship driver, so his primary concern is is that 15 or 20 years from now when they have the design basis event that there's enough margin for the operators

out there to recover the facility.

CHAIRMAN: I understand that's absolutely a key thing. And your sense of the margins being built into the system today, do you have any feel for that?

MR. BRUNSON: It has not been demonstrated to meet my expectations to date, sir.

CHAIRMAN: So what you're saying, so that everyone understands, if we talk about an issue like erosion and corrosion, it's really got to have some margins, there are unknowns about the waste and unknowns about the chemistry, unknowns about what's going to be in the pipes and the vessels. There needs to be a cushion built to make sure that if there's some variations in terms of what the plant sees that it's able to handle it?

MR. BRUNSON: Yes, sir. This being a nuclear facility, my perspective is is that that must be something that is innate within the design.

CHAIRMAN: Right. And I overhear you're obviously, Ms. Busche, planning on getting the controls in place to not only prevent but mitigate anything that happens, right?

MS. BUSCHE: That's correct.

CHAIRMAN: All right. So that's kind of the strategy. It's really overall really quite a nice approach that is laid out in the regulations of the

Department 10 CFR Part 830 about how to go about doing this. And it basically means you're going to look at the accidents and the hazards and identify a set of controls that can be implemented to be certain that the public and the workers are protected.

MS. BUSCHE: That is correct.

CHAIRMAN: I appreciate that. Any final thoughts from you, Mr. Samuelson?

MR. SAMUELSON: No, I don't believe so. I think it's been quite a conversation.

CHAIRMAN: Well, with that we want to -- we have a lot people from the public who want to provide public comment. We're going to move on to that section. I want to thank you, Mr. Moury, Mr. Samuelson, Mr. Harrington, Mr. Knutson, Mr. Brunson, Mr. Patterson, Ms. Busche and Dr. Beranek. Thank you very much.

At this time per the Board's practice and as is stated in the Federal Register notices, we will welcome comments from interested members of the public. A list of those speakers who have contacted the Board is posted at the entrance to this room. We have generally listed the speakers in the order in which they will speak. I will call the speakers in this order and ask speakers to state their name and title at the beginning of their presentation. And if they have any testimony that they'd

like to submit into the written record I'd be happy to do that.

There was also a table at the entrance to this room with a signup sheet for members of the public who wish to make a presentation but did not have an opportunity to notify us ahead of time. And I think we're done with that process right now. They will follow those that have already registered with us in the order in which they have signed up. To get everyone wishing to speak or to make a presentation an equal opportunity, we ask that speakers limit their original presentations to five minutes. The Chair will then give consideration for additional comments should time permit. Presentations should be limited to comments, technical information or data concerning the subject of this public meeting and hearing. The Board members may question anyone making a presentation to the extent deemed appropriate.

We want to thank in advance all the members of the public who have come here to provide comments as part of this discussion. With that I will call the first member of the public, Dr. Walter Tamosaitis.

DR. TAMOSAITIS: Good afternoon. Is this on? Yes? Is it on? Do you want me to sing, no? All right. Let me try again.

Good afternoon, Board. My name is Walter

Tamosaitis and I am here representing myself. First, I want to thank the Board for their focus and oversight on the WTP. We need the WTP in the Northwest but it needs to operate safely and it needs to operate well.

It is clear to anyone watching that the only group concern with what is going on, especially in the last couple years is that DNSFB, the Board. Without your oversight and involvement DOE, Bechtel and URS would have proceeded to build a plant that would not work. As an example, your investigation and as commented on earlier this afternoon, the last meeting led to commitments to do the large scale mixing test.

Today we have heard about many technical problems. I believe some of the answers you've heard are really okay if it was the first or second year of the design. It's now been over a decade since Bechtel and URS have started the WTP. And by all accounts this is the fourth attempt by DOE build a Vit plant. You've heard about reconstituting, which I'll use the word redoing, the safety basis. Before you can reconstitute and redo the safety basis you need to have a process, you need to define what that process is.

There are many things which are troubling when you look at the performance in the WTP by Bechtel and URS but I'll highlight just two of them. One of the most

troubling one is that after a decade and over $6 billion having been spent, nobody in DOE, Bechtel or URS can stand up here at this mic and ensure us the public that the place will operate safely and operate efficiently within the current -- with the current design. But yet, we have heard several times today the talk about the pivot point and moving ahead. Changes are needed in the culture and changes are needed in the design.

Second, I think it's very troubling that after all the time we've yet to define what the plant can process. And that discussion occurred several times today. I can use many analogies but I'll just ask: How do you build a chemical plant when you don't know what the plant will handle? How do you do the safety analysis when you haven't defined that? That's been the issue for a decade and more. And DOE stands there and let the contractor go on. I say again or ask again how do you go through a so-called pivot point when you don't know what the plant will do?

Many technical issues exist and still need to be resolved. Clear and accurate communications are needed so all stakeholders and taxpayers know where the project stands, and that includes Congress. Bechtel claims all technical issues are closed. If they are closed how can you be planning to spend nearly $200 million on a mixing

test? And if the testing costs $200 million, what will the plan changes cost? How can you have the erosion concerns when the erosion issue was declared closed? Shouldn't the issues be reopened that now have a lot of work going on?

I am told that due to insufficient pump head Bechtel engineers are looking at raising the tanks. And the question on sampling was a very good one. How are you going to do that if the tanks are not well mixed?

I think I just touched on at least six of the EFRT issues, which they claim are closed. And getting a true schedule for the technical problems is near impossible. The schedules quoted to you, and I ask that the Board review whatever you're told today very carefully, because the schedules quoted to you in the last public meeting are nowhere near reality today. This represents not only technical problems but cultural problems associated with their communications.

The cultural and communications problems are not limited to technical. Bechtel claims the total cost of about $12.3 billion. The recent CPR indicated it would go up by nearly another billion. Current internal reviews indicate the costs will be somewhere between $18 and $20 billion. The question is: Does that count the expanded low level Vit, canister storage, effluent plant

improvements, pretreatment fixes, and the pretreatment for pretreatment. An accurate assessment of the total cost is needed and needs to be communicated. After a decade of the misguided effort I think it's obvious that major changes are needed in both the technical aspects and the culture.

I applaud the defense board for their efforts and ask you to continue your effort and pursue with Congress establishing a new design of authority. I ask for the Board to work with Congress to establish independent technical oversight, another B and B or EFRT should be conducted. I ask for the Board to push for an agency to have enforcement authority over DOE of which the Board themselves would be well qualified.

Whoever provides the oversight over DOE should also have enforcement authority. DOE has proven that they are incapable of self management and management of their contractors. We need the WTP, as I stated in the beginning, but it needs to run safely and it needs to run well. It needs to finish its mission in the designated time. I thank you for your past and continued efforts to see that the WTP is built correctly. I will be providing written comments after I listen to the session tonight and will summarize my thoughts. Thank you.

CHAIRMAN: Thank you. Miriam German.

MS. GERMAN: I'm Miriam German from Portland, Oregon from Occupy Portland. As many of you know, we're coming up here in April on April 15th to present a day of awareness. Regarding everything that's been done today there's so many questions, the DNFSB has questions, we have questions as just the people living down stream. And we do live down stream. So everything that goes on up here at Hanford concerns us in Portland and everyone else all on along the way.

So in the last six months we've been coordinating together at Occupy to create a list of questions that we were coming up with, some of which have been dealt with today and thank you for that to the DNSFB. I'd like to stick to my questions so that I can just present them to the public and hope that at some point we can get some direct answers, and these are some of them.

I'm just going to start anywhere. Where did the missing 15 million of missing tax payer money go for the poor quality tank fabrication? And why has Bechtel not returned it? As an Occupier, these issues are important to us.

Why was the mixing issue declared closed if over $200 million will not be spent just to test it? How much will plant changes cost?

What does Bechtel plan to do to prevent trapping explosive hydrogen gas and prevent explosions like at Fukushima?

What does Bechtel plan to do to prevent criticalities from happening?

Why is Becthel proceeding with a design if the testing shows major pipe erosion?

Why does the DOE let Bechtel proceed with an incomplete design? And that's really disconcerting to me.

What will the DOE do differently the next time a whistleblower raises an issue. To me personally whistleblower's are the canary in a coal mine. I understand after doing this research that Washington has no whistleblower law, protective law, and that's concerning and we do plan on talking with the senators in Washington about that and seeing if we can help Washingtonians to make a change for that.

Let's see. What is Patty Murray, Maria Cantwell and Doc Hastings doing to have the WTP culture and technical problems corrected? Why did Patty Murray's office support Bechtel with no information in hand when Walt Tamosaitis came out as a whistleblower in 2010?

Why does the DNFSB not have enforcement authority? I'm not sure if you guys can address that

today up there on the panel, but we'd sure like it if you could and we'd like to do whatever we can to help make that happen. And if that means writing letters to Congress then we're going to do that because showing us today your questions were powerful and we really appreciated that. And what we weren't getting from this end and from the DOE's end and Bechtel's end were dates, money, real answers to what your questions were. And I really wish that you had more power to make them do what it is they say they're doing because personally I'm not really believing that they're doing most of what they say they're doing. And I'll put that on the record.

What did the DOE do with the tank farm WTP oversight group recommendations? This was a contract line item group. Why were the reports never made public? Why did the DOE now do away with the CLIM 3.2 oversight group? Like I said, we've been doing our research.

Why is Bechtel both the design authority and the design agency and then paid for costs and schedule performance with no responsibility for long term operations?

In October of 2010 at the DNSFB public meeting Russo said that Bechtel would issue a definitive plan by August of 2011. And according to my clock that has already gone by. Where is that?

Russo also said that key design testing would be done in 2012. When will the testing start? When will the large scale mixing test really be done?

CHAIRMAN: So, Ms. German, could you briefly summarize and finish up? Thank you.

MS. GERMAN: I'll do that. We have a lot of questions and we'd really like some answers. I'd like to present this to you at some point before we leave today so that we can get some definitive answers in document form. Thank you.

CHAIRMAN: We will definitely accept it into the record. I thank you very much. We will get that for the record right now. Thank you.

Heidi Lambert.

MS. LAMBERT: Sorry, I've never done this before. My name is Heidi Lambert, I live here in Richland, Washington. I come from generations of veterans who have worked at Hanford. And I'm also a member of Occupy Tri-Cities. I want to submit written questions as well.

In summary, I just want to thank you again for this opportunity because I've never had this opportunity before. And as this is just another day at work for you guys, I just want to let you know that I took the day off today to come and speak because this is that important to

me.

My largest concern is about the BNI not being committed to the long term consequences if there is an error. With the WTP continually we are told how robust the WTP will be built but we're never told how much more will need to be expanded for the low level vitrification, canister storage, and other changes in costs. And how will they know that if they don't even know what they're testing or what they're processing until the tests are over. That concludes my statement. Thank you.

CHAIRMAN: Thank you. Richard Wood, please.

MR. WOOD: Good afternoon. Thank you. My name is Richard Wood. I'm from Portland, Oregon. I'm a member of the Portland Occupy Group and a number of other environmental groups and consider myself fairly socially active. We're supporting open government for the people. That's really what we're demanding. We want to know more about what is going on inside our government, these decisions that are being made. So that's a piece of it. The government's working towards that. The information that you all, your subcontractors is a piece of what we consider open information and we want to know about it. So I know there's work going that way. That's just a statement. I'll submit these comments written to the DNSFB after the meeting and some thought into some of

these questions.

Basically I'm deeply concerned over health issues caused by ionizing radiation and a poor oversight plan by Congress in resolving the risks introduced by nuclear radiation. The nation has been well aware of the health concerns of atomic energy for decades. There are too many lapses and open questions that undermines our confidence and the motives of the Hanford project and all cleanup activities intended to protect public health.

The fact is we are increasingly being exposed to radiation, the risks are increasing and there are lessons that we have learned but not taken to heart that threaten our own safety. Hanford is one example of this. This is not new. Fukushima is the latest example of the potential and results of a nuclear accident. There are nations with land destitute and fallow for centuries to come without great interventions to resolve what we've done to our planet. Fukushima's contaminated air and the Pacific Ocean with MOX fuel waste, Hanford, Three Mile Island, Chernobyl, Savannah River, and a list proving grave dangers and consequences of poor management and oversight go on. So your work is critical to our children's future.

Ionizing radiation is a known carcinogen and every health organization recognizes that as a fact.

The risk of getting a cancer is low and there are many statistics to support that. While both statements are true, why is there not one institution responsible for studying and setting the standards for allowable exposure.

That was one of my question when you were asking your safety folks, what standards were they using. I've found three, seven, 10 different numbers depending on who you are, what nation you're in and whether you're DOD, DOE, or work in a hospital. Why so many different rules?

I do not understand the basis of how you're coming to a safety conclusion when what numbers are you using? And I know your sources, depending upon which side of the fence, commercial or the fence you're on, that's disconcerting and to me that's an issue.

Basically what happens in all this is the individual ends up assuming their own health risks from whatever work they have done in the area. So a contractor comes in, works or two years, and 10 years later ionizing radiation causes the cancer. It could have been a cigarette, it could have been farmers' waste down the field, or it could have been radiation from 10 years ago. I'm in that case from a number of different contamination hazards of all sorts. So it is just disconcerting that there's so many different rules and we

don't understand what it is.

Universal healthcare would change that situation. One of the big things that we all worry about is liability, corporate liability, personal liability. Right now everyone of us is assuming a personal liability by coming in the Hanford area and drinking the water. Is it a high risk? No, it's not. But we are. If you poison me whose responsible? I'm going to end up paying for it. It's my health insurance. If my employer doesn't like that I'm a whistleblower and fires me and five years later I get cancer, well, shame on me for being a whistleblower. That's the general attitude. And that has to change.

Hanford --

CHAIRMAN: I would ask you, sir, can you summarize your comments in the next minute or so?

MR. WOOD: Okay. Thanks.

Hanford is the poster child, it is one of the many across this states let alone the globe. Savannah River and Hanford are sister sites. I personally worked in the early '80s on Savannah River doing low-level controls. Congress de-funded the project. It disappeared out of site yet the project was finished. So the money didn't go away, it got changed or moved around, but something got finished there.

This conversation about Hanford is the same conversation that was occurring 10 years earlier about Savannah River, this is not new. We seem to have lost a lot of intelligence across these projects for a number of reasons.

I see a weakness in program management, I see a weakness in project management, I don't see great methodologies being followed, I see all kinds of reasons why. But you folks own this and some management organization needs to take control and get this under control. We need to get this past us. We should have a million new jobs around cleaning this stuff up. And we're worried about women's private issues. I don't get it. Thank you. I appreciate it.

CHAIRMAN: Thank you. Beth Giansiracusa. I'm sure I didn't pronounce that correctly, but I tried.

MS. GIANSIRACUSA: You did a really good job. It's Giansiracusa.

CHAIRMAN: I practiced for about 10 minutes.

MS. GIANSIRACUSA. Again, my name is Beth Giansiracusa and I belong to several different groups, mainly We the People and Occupy. And I'd like to take a minute to thank the women in this room for holding true to some of the integrity that I don't see a lot of the men have been doing throughout this process.

I have been listening and I had something written but I'm changing it up because my main concern is the Columbia River. And you continue to talk about this really thick waste and you talk about a third of those tanks leaking and I know that that leaking is going into the ground water, it's going into the ground, it gets really thick. I saw the whole presentation when they shifted it and made all these wonderful things about how they were going to do the Vit plant.

And I am really concerned about what is actually traveling down this river because it is still leaking. And I can't get anyone to answer me. I can't get anyone to tell me whether it is radioactive, how long it stays radioactive. Everyone that says basically the minute it hits Willamette it's dispersed, it's not there anymore. But, you know, how can radioactivity end up being not there anymore?

I know that when we dredge this river all kinds of stuff come up. I know that we can't eat bottom feeding fish. I know that we have this kind of problem. And I would really like to see someone take responsibility for saying that the Columbia has some problems. That if Portland wants to do that well drilling in the Columbia well fields that I don't want to feel that, you know, they're drilling, they're bringing

stuff up and radioactivity is coming up. And every time they dredge all the way the Columbia River for these big boats you still have stuff coming up. Every time they do that I think the scientists are basically saying there's radioactivity in the algae. I'd like to see something like that posted for all of us so we can stop being in any kind of denial and make proper choices. Because when we don't have these proper choices and we don't know what's there we can't make them. But if you give us what there is there, I mean, we're responsible people, we can choose to move, we can choose to change jobs, we can choose to do a lot of things. We can't make any of those choices if the one that is above everybody else doesn't have any teeth to tell them they can't do it or that they are afraid because of all the lawsuits that happened through the '90s on this down river stuff. A lot of money went into that. This has just got to stop.

And that's kind of where my concern comes from, it is with the rivers, with the water, we're 98 percent water people and I know water basically can move a lot things through but I am so not sure about this nuclear waste that continues to leak and you're continuing to talk about how that's the problem, how that's the stuff sitting at the bottom of the these big, huge vessels that you can't get up and out because you only have this much

room to get into those vessels because you don't want to go anywhere near them.

So that's some -- basically what I have to say. And I will go ahead and put this stuff in writing and send it on to you. Thank you so much.

CHAIRMAN: Thank you. Steve Fairish.

MR. FAIRISH: My name is Steven Fairish, I'm also with Occupy Portland and I have one question. Why have Bechtel and URS been reimbursed with taxpayer money for their legal defense when they're the ones who caused the problem to begin with? Thank you.

CHAIRMAN: Thank you. Shelly Doss.

MS. DOSS: Hello. Good afternoon. My name is Shelly Doss. And I'm here representing myself. I want to talk to you guys. I felt very compelled to talk to you. I worked out at Hanford for 23 years out in the tank farms itself, I started out there many, many years ago. I started out in radiation safety, health physics technician is what I started out in. I worked my way up and went through environmental.

My whole career out there I have been in the field, worked with -- I have been highly involved in all of our retrievals, highly, highly involved. I know what it takes to develop a retrieval plan, to work through the readiness and assessment, the startup and to get going.

I also know the risks you take, the grave risk you take constructing without knowing all of your hazards.

And what I wanted to speak to you guys about today was having firsthand knowledge and knowing what goes on. I really implore you, I have been listening to everybody's testimony today and I'm still concerned. I heard DOE, I heard WTP both say we don't know all the hazards. And you know what? They're right. We don't.

The tank farms back in 2001 we discovered there was it 1,400 new chemicals. Just because of the nature of what we do I have personally been working in and around those tanks. And I know what the corrosion factors are. I mean, I have been out there where we have actually had to put people in a pit with a sledgehammer and a wedge to try and literally break free a pump that has been sitting in the bottom of the pit that is corroded itself to that pit. I have seen that. I have done that. I've experienced that many times over.

And what really concerns me is you have this URS/Bechtel pairing. I recently got laid off from URS, excuse me, from WRPS, which is their parent company is URS. And this not a grudge match. I'm not trying to do anything like that.

What happened was and yes, and I am in litigation with WRPS. I want to make that very clear

with everybody right now. I'm not trying to hide that. What happened was my whole career out there I have always brought up and we have trained you bring up your safety issues, you have a very strong safety culture. That was fine. All was good. I was commended. I was recognized, as well as many other members of the groups that I worked with for doing this. When WRPS came in that all changed. And raising the safety concerns and bringing these things up in the safety culture quickly demised.

And I have also heard being out there for as many years as I've been out there I know people in many different areas all over the site and the things that I have learned of what's happened do WTP quite frankly are very disconcerting. They very much bother me.

And where I know for a fact there's a definite chilling effect for people that bring up safety concerns, most definitely. And also now with the amount of recent layoffs and the people that were chosen or I should say it was interesting how they were chosen. Many people out there are flat scared for their jobs to bring up these safety concerns. I mean I'm a poster child for that. I brought up safety concerns and now I no longer have a job after 23 years. When, trust me, it wasn't that I was a bad performer, wasn't that I didn't do my work.

But it is sad that you guys can't be more of

oversight over DOE because DOE I don't believe has the teeth they need to. I do appreciate what the DNSFB has done. But please very seriously look into all of these technical issues. What we don't want to have another -- I don't know if any of you up there are familiar with the grout facility but I was out there when we started up grout. And me down on the very low levels, just a plain little worker, when we -- when orientation, when we went hot in that plant everyone of us said, Wow, we know what system's are going to fail. We could tell. And we're the lowly little low workers.

When I'm hearing all these different levels of people talking about what could fail at WTP that does concern me. Look what happened at grout. We didn't know what we had. And now you've got a multi-million dollar complex sitting out there rusting and aging and decaying.

WTP or something similar must be built. I realize that, trust me. I understand that. I know that. I know we have leaking tanks. I know what we're doing. It has to be built but you cannot retrofit it after it is built, especially once you go hot. And the sad thing that keeps occurring is its schedule over -- schedule and production over costs and safety. That is always what it is unless it is a quick safety fix.

And the sad thing is 10 years ago we started

this. I remember when we started talking about doing the Vit plant. And I had a lot of ideas and a lot of things that needed to come forward with concerns, and here I'm still hearing those things same things over 10 years later. It is like, wow, what has really happened. And it's not that I don't want to see this plant built, either this or calcification, something, something has to be done. But for heaven's sake, please look into this. And for the DOE folks and the WTP folks, please don't take any offense to any of this. I know how the contractors change and come and go after years and years and years. There's very few of you people that here now that I knew back when I hired in 23 years ago.

CHAIRMAN: Could you summarize?

MS. DOSS: I certainly can. I'm sorry for taking so long, sir. Yes. Please review all of these safety and technical concerns, and if there is something I implore for DOE and WTP to please slow down the production, if not stop, especially the construction before you get to the point where you have fabricated these things, put them into place and heaven forbid you go hot. Because once you go hot your costs will increase 10 fold easily. I have seen it firsthand on our retrieval platforms.

So thank you again, Board, very much for your

time and thank you again very much for allowing us to speak.

CHAIRMAN: Thank you, Clarence Corriveau.

MR. CORRIVEAU: My name is Clarence Corriveau. And I'm glad I'm on the other side of the room. Sorry, I'm Occupy Richland. And I occupy it very happily and without rancor either. I worked for Becthel for 37 or so odd years and so I understand a little bit about engineering and I understand a little bit about WTP. And I was one of the very first WTP mechanical supervisors on the job. So I understand it. I spent time during BNFL and up to about 2006 or thereabouts. Through 2006.

It is interesting to hear something that I wrote down in my notes before I came here that they're beginning to talk about root cause analysis. My goodness, after 10 or 11 years all of the sudden we're getting down to why are we 10 or 11 years behind? But what I didn't hear is clearly and succinctly that part of the root cause for all these little silly issues, that your -- they're little, I got to tell you they're little issues. Quite frankly, they're almost too small to even be talking about because you can solve them in a heartbeat. But the organizational and contractual structure that's set up here at Hanford is wrong. It breeds animosity and it does not breed brotherhood,

sisterhood and getting a job done well and conservatively. That's period, exclamation point. And everybody in this room really that has been on the job knows that. Absolutely knows that.

Let me refresh here because I -- never had to complain about Bechtel, by the way. So I won't. But I will complain about the DOE because they don't do enough. In fact, they don't do much of anything but quote oversight. Well, what kind of -- how can they earn their money doing that? That is worthless. Get down and get your shovel. Period. There is a Hanford culture here and everybody that's been here very long but remembers their past lives understands that it is not very good. It's never getting anything done. And I'm still shocked because that's the truth. And you all know it. But what I also heard today here and not said was that so-called safety analysis that you hear. I have done a lot of that in my past life, particularly before I came here, and what passes for safety analysis is pure bunk. Absolute bunk, bureaucratic -- I won't use anymore nasty words but it is, when you talk about peeling the onion back for safety basis, they've created a cloistered priesthood of inexperienced safety people. And then they still don't have criticality controls. That's incredible. No one should accept that. That's absolutely incredible. And I

know everyone else in this room feels the same way. That's incredible. But it is set up by the organizational structure and the three DOE, Bechtel, URS and the subcontractors that are set up it is creating -- it's created an unbelievable competition. I know because the engineers don't talk to those safety guys and vice versa. And you heard some of the testimony today that that's the truth. But more importantly, that bureaucratic, silly procedure and system that they have set up to do that is absolutely balderdash. And that's the root cause. That and the organizations competitive and not working together. Well, you hit the working together pretty much, didn't you?

Now, regarding the PJM's, I know a lot about them. I signed off some of the documents and the contracts for them and approved drawings. And the answer there is very simple. Very simple. It's been identified in writing in documents, you'll find them because I wrote them. Okay. The answers are very simple. You put enough air down them, blow them fast enough, hard enough, and you put enough in there, it mixes, period. That's the end of the question. And it's the answer. Now, this testing program we identified what each of the vessels needed a long time ago, but no one was willing. In fact, I was told to shut up. The solutions are there and they

will be solved. And I ask people to move on very crisply to do that because when you hear people downstream over there in Oregon worried about nonexistent radiation problems. You're giving them fodder. So Godspeed. Godspeed.

CHAIRMAN: Would you begin to summarize your comments, please?

MR. CORRIVEAU: One more. One more point. It is absolutely disgusting that DOE would not allow all the data that's needed for the front end of this plant to be. It's absolutely unbelievable that we allowed that to happen. And I meant we in the most large sense of the word. There was -- a solution for that is also identified. Okay. And some of you might even know what that is. I'll share that with you separately with you if you want.

But in conclusion, you got to get back to the engineering fundamentals. Period. Keep it simple. Keep it conservative. It can be done very simply. No more of this puffery and speech making. And I'm finished with my speech.

CHAIRMAN: Thank you. Gregory Sotir. He didn't come. Thank you.

Jason Pedegana.

MR. PEDEGANA. Hi, my name is Jason Pedegana. I

am here affiliated with Occupy Portland but as well as the Oceania Water Conservation Agency and super group and moreover just as a concerned citizen, native Pacific Northwesterner as well as Cascadian by region. I just have a really quick couple questions for you to go on record. And I'll get out your hair.

First of all, I'd like to know, the amount hazardous nuclear waste in the tank farm was once cited to be about 53 million gallons. Now the number is 56 million gallons as quoted. I would -- why is it increasing and how much of it has leaked into the environment? How much will have leaked by 2022? I think that does concern everybody regardless of where you do live. This is our planet. Upstream, downstream, we're standing here.

Second part is when will the congressional members investigate what is going on and correct it? And I thank you for your time.

CHAIRMAN: Thank you. Alexander Baretick. Mr. Baretick. Jessie Sponberg. Jane Hedges.

MS. HEDGES: Thank you. My name is Jane Hedges and I represent the Washington State Department of Ecology. I thank you very much for the opportunity to be here and also for the information that was shared today. We sincerely appreciate the Board's involvement.

The Waste Treatment Plant is critical to the state of Washington and to the region. You've heard from our neighbors in Portland. We have to treat the 56 million gallons of high-level waste that exist on Hanford. And we have to put it in the most safe configuration that we can possibly do. And the state of Washington believes that that is vitrification. And so we need this to succeed. And we all need to work together to make sure it does succeed.

So the questions that you ask, the investigation that DOE and their contractors do, and the oversight that the state of Washington does, we all need to work jointly to make sure that we are answering these questions, that we're strategic in addressing not just one as we heard today, but all the whole series of them. And that safety remains the number one priority for all of us that are here and working on it and all of our communities, because for our -- certainly our community it is pivotal that we have this -- the whole Hanford site cleaned up but certainly the tanks addressed. And so we thank you. We appreciate the information that was provided by DOE and Bechtel. And we look forward to further involvement. We are a bit frustrated with some of the issues, the erosion/corrosion was an issue that the state brought up in 2004 that we thought was resolved

and appears to be returning.

So again, I think we all need to be very diligent in our activities to work together to get this resolved and get a safe plant built and operating. Thank you.

CHAIRMAN: Thank you. Richard Worel. Richard Worel I have that correct. I don't see him. So we'll move onto Suzanne Dahl.

MS. DAHL: I'm Suzanne Dahl from the Washington State Department of Ecology. I work here in the nuclear waste program locally. Our -- the main objective of the nuclear waste program is to do the regulatory oversight of Hanford. We have a consent decree that's signed in front of a court to have the Waste Treatment Plant built and operational by 2019. And it is a very serious commitment because the waste as it sits in the tanks is a very serious environmental threat to the Northwest.

I just wanted to add a few comments to Jane Hedges comments, and that's we at Ecology we issue permits that are sort of like licenses in the sense that we issue a dangerous waste permit or RICQUA permit to allow the construction and operation of the Waste Treatment Plant and many other facilities at Hanford. But specifically to that, we have folks that are looking at the design as it evolves and getting it into our

permit.

It is frustrating for us for things like erosion and corrosion and material selection to still be coming up this far into the issue. We appreciate the fact that the Department of Energy is doing those detailed level of surveillances and identifying the problems. So it's not that I don't want the problems identified. It is frustrating that they haven't been identified to date and especially since we did put a hold on vessels being installed in 2004 due to erosion issues and had the Department do some erosion testing to validate their erosion equations.

So there are other issues that were discussed today that are very important to the waste treatment plant and important to the State that they be resolved. The mixing, being able to clear the solids out of the bottom of vessels, being able to have a functioning facility that moves all the waste, the liquid waste and the solids portions through it so that can run efficiently and effectively and safely. Having a safe facility is obviously paramount. I mentioned the erosion/corrosion issues.

And then also having a facility where through its various licensing whether it's from the nuclear safety end or from the dangerous waste regulations. And

where you have a waste acceptance criteria that from the waste coming from the tank farms and within waste as it is transferred through the Waste Treatment Plant in its various places something that's functional, a waste acceptance criteria that's functional and allows the facility to operate in an efficient and effective manner. And obviously, as Jane Hedges said, having a Waste Treatment Plant running resolves a major health and safety issue and environmental issue of the 56 million gallons as they sit in those old aging underground tanks currently. Thank you. And appreciate the Boards's interest in this subject.

CHAIRMAN: Thank you. I have one additional name who had testified previously, she down a second time. Heidi Lambert. Do you have anything additional to add?

You're interested in testifying this evening also?

MS. LAMBERT: Yes.

CHAIRMAN: All right. We'll note that.

So with that I'd like to -- this ends the part of the program dealing with public testimony. I'd like to thank all the members of the public who did provide testimony. At this time the Chair calls a recess of this public meeting and hearing. We'll reconvene this evening

at 6 p.m. Thank you.

(Hearing recessed at 4:14 p.m.)

C E R T I F I C A T E

STATE OF WASHINGTON)
) ss.
COUNTY OF YAKIMA)

This is to certify that I, Jori L. Moore, Certified Court Reporter and Notary Public in and for the State of Washington, reported the within and foregoing hearing; said hearing being taken before me as a Certified Court Reporter on the date herein set forth; that the witness was first by me duly sworn; that said examination was taken by me in shorthand and thereafter under my supervision transcribed, and that same is a full, true and correct record of the testimony of said witness, including all questions, answers and objections, if any, of counsel.

I further certify that I am not a relative or employee or attorney or counsel of any of the parties, nor am I financially interested in the outcome of the cause.

IN WITNESS WHEREOF I have set my hand and affixed my seal this day of , 2012.

JORI L. MOORE, RPR,
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