UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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BRIEFING ON WATTS BAR UNIT 2 LICENSE APPLICATION REVIEW

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THURSDAY

OCTOBER 30, 2014

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ROCKVILLE, MARYLAND

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The Commission met at the Nuclear Regulatory Commission, One White Flint North, Commission Hearing Room, 11555 Rockville Pike, at 9:00 a.m., Allison M. Macfarlane, Chairman, presiding.

COMMISSION MEMBERS:

ALLISON M. MACFARLANE, Chairman

KRISTINE L. SVINICKI, Commissioner

WILLIAM C. OSTENDORFF, Commissioner

JEFF BARAN, Commissioner

EXTERNAL PANEL:

GORDON P. ARENT, Director Licensing, Watts Bar Nuclear Plant

JOSEPH P. GRIMES, Executive Vice President and Chief Nuclear Officer, TVA

DON SAFER, Board Member, Tennessee Environmental Council

JOSEPH W. SHEA, Vice President, Nuclear Licensing, TVA

MICHAEL D. SKAGGS, Senior Vice President, Watts Bar Nuclear Operations and Construction

KEVIN T. WALSH, Site Vice President Watts Bar Nuclear Plant

NRC STAFF PANEL

MARK SATORIUS, Executive Director for Operations

WILLIAM (BILL) M. DEAN, Director, Office of Nuclear Reactor Regulation (NRR)

MICHELE EVANS, Director, Division of Operating Reactor Licensing, NRR

VICTOR McCREE, Regional Administrator, Region II

TOMY NAZARIO, Senior Construction Resident Inspector, Region II

JUSTIN POOLE, Project Manager, Division of Operating Reactor Licensing, NRR

P R O C E E D I N G S

9:03 a.m.

CHAIRMAN MACFARLANE: Good morning. I'd like to welcome the staff, our staff, the industry, the public to today's meeting on the status of Watts Bar Unit 2 Operating License Review and Path Forward. So today we're going to have an opportunity to hear a historical overview of the Watts Bar Unit 2 project, the status of construction completion, licensee plans for transition to operations and the general state of the site operational readiness.

We'll also get a public interest group perspective on Watts Bar Unit 2 as well, and we're going to look at the time line and actions of the Tennessee Valley Authority and the NRC staff to complete the remaining licensing actions to support a licensing decision on Watts Bar Unit 2, as well as we'll get a detailed discussion on the status of construction inspection and any open items.

So given the long history of Watts Bar 2, I think it's important that we fully understand the previous construction challenges, how the potential aging of components has been managed by TVA, and the licensee's state of preparedness for dual unit operation before a decision is made on operating license.

It's also important to ensure that Watts Bar Unit 2 meet the NRC recent requirements, including the Fukushima orders and cybersecurity regulations. I'd like to give a shout out to the NRC staff, who have provided continuous oversight of the construction of Watts Bar 2. I commend them for their robust construction oversight activities, while at the same time keeping a strong focus on the safety of

the operating unit, Unit 1 at Watts Bar. So we'll hear more from the staff in the second panel.

So the first panel, our external panel, we'll hear from a number of folks from Tennessee Valley Authority. We'll hear from Mr. Joseph Grimes, right here in the middle, executive vice president and chief nuclear officer.

We'll hear from Mr. Michael Skaggs, senior vice president, Watts Bar Nuclear Operations and Construction; Mr. Kevin Walsh, site vice president of the Watts Bar nuclear power plant; Mr. Joseph Shea, over here, vice president of Corporate Nuclear Licensing; and Mr. Gordon Arent, director of Licensing, Watts Bar nuclear plant.

We're also going to hear from Mr. Don Safer, who's a board member of the Tennessee Environmental Council, all right, and then we're going to hear from the staff. So I look forward to your presentations. Let me first see if any of my fellow Commissioners want to make any opening comments. Go ahead.

COMMISSIONER BARAN: Thank you, Madam Chair. I just want to say it's good to be here for my first public Commission meeting, and as I've told you before, it's an honor to join you and my colleagues on the Commission, and I look forward to working with the NRC staff and the stakeholders. Thanks.

CHAIRMAN MACFARLANE: Great, great. Thanks. Yes. Thanks for welcoming every -- we welcome you, Jeff, to the Commission and to our meetings. We actually had a few meetings yesterday where Jeff was at, so he's becoming an old hand at these already. Then without further ado, I will turn it over to Mr. Joseph

Grimes.

MR. GRIMES: Chairman and Commissioners, good morning. TVA appreciates the opportunity to present our progress and our path forward in achieving the operating license for Watts Bar Unit 2. We're very energized about bringing Watts Bar Unit 2 online as the nation's first new nuclear generation of the 21st century in the right way, with safety and with quality.

Today's presentation will be provided by the following members of the Watts Bar station team. That would be Mike Skaggs, who's senior vice president of Operations and Construction at the site; Kevin Walsh, site vice president; and Gordon Arent, the director of Watts Bar Licensing.

Next slide, please. During today's presentation, we'll discuss a number of aspects related to the completion and operation of Watts Bar Unit 2, including the current status of the unit; TVA Nuclear's corporate role in the completion of Watts Bar Unit 2; the implementation of current regulatory requirements; key initiatives we've undertaken during the completion of Watts Bar Unit 2; and most importantly from my perspective, that our readiness is on track at this point to manage the two units at Watts Bar in a safe and reliable manner.

Next slide. TVA is confident that our licensing strategy for Watts Bar Unit 2 is sound. Watts Bar Unit 2 is being completed in a quality manner and in compliance with design specifications and regulations. Following licensing, Watts Bar Unit 2 will be fully integrated into our nuclear fleet operations at TVA. I'll now turn the presentation over to Mike Skaggs.

MR. SKAGGS: Thank you, Joe. I'll be starting on Slide 4 here. Safety and quality is the foundation for what we do at Watts Bar. We've gone over 29 million man hours without a lost time accident. We've continued to reinforce a strong nuclear safety culture and with respect to the quality of work, our performance is greater than 97 percent for the first time verification of our work.

We have built the plant to design, and we have performed periodic audits and surveillances. We use external assessments to help us understand and continually improve our performance, and the NRC is validating our results through their inspections.

With respect to Watts Bar and the design basis fidelity, our approach at Watts Bar is to make sure that the two units align with respect to design basis. The benefits of having two units similar in design basis is single licenses for our plant operators.

It helps improve the safety performance of the plant, and it helps improve our human performance with respect to the way we operate.

Slide 5. Our guiding principle in the completion of Watts Bar Unit 2 is that the plant would be built and tested to assure the plant is safe and reliable to operate and maintain. To that end, we have made Watts Bar Unit 2 like new.

We did develop a refurbishment program that was reviewed and approved by the Nuclear Regulatory Commission and the staff; we examined concrete; we examined embedded steel; and we verified systems and components, both active and passive, meet

design specifications or replace with new components or new equipment.

Examples of this include replacing safety-related motor operator actuators; having the original equipment manufacturer take their piece of equipment that was provided to us and rebuild it, including safety-related pumps; installing miles of new cable; and examining piping and replacing the piping where it showed degradation.

We are now performing the testing to verify that the components meet their function, and that the systems meet their function properly.

On page six, bulk construction work is largely completed, and we're in the phase of testing safety-related systems currently. Open vessel testing is complete. With open vessel testing, we verified that the systems that are tied to the reactor vessel properly pump forward water into the system as designed.

Cold hydrostatic testing is complete, and with the cold hydrostatic test, we verified that the reactor vessel and the piping that's attached to it withstand 125 percent of the design pressure for those systems in the vessel. What that did was it ensured that we had the integrity of the vessel and the piping.

Next, the World Association of Nuclear Operators conducted a pre-start up review of Watts Bar. That assessment was to look at our ability to -- our ability to run two units. That assessment concluded that Watts Bar's preparation is on target and satisfactory to operate two units.

On page seven, hot functional testing is our next major

testing milestone prior to fuel load. This test operates the plant without fuel at operational temperatures and pressures, to confirm that the integrated systems perform as expected.

Some sub-milestones between hot functional and fuel load include the containment integrated leak rate test, which confirms that the containment and the penetrations associated with containment show their integrity for the pressure, and that they're leak-tight.

Area turnovers is another milestone between the two, hot functional and fuel load, and with the area turnovers, we'll verify that the physical structures are complete and they support plant operation, and that the construction equipment has been removed from the areas, and that the areas are restored to operational standards before turnover to the plant for operation.

The fuel to be used at Watts Bar Unit 2 is on site, and we'll verify that the activities necessary to support fuel load milestone are complete. We are not without challenges at Watts Bar 2. As we move toward the completion, we expect to have difficulties with component testing, and to address that, we've looked at our staff, we've looked at our organization, and we've enhanced our process to be ready to perform those tests.

Secondly, we've added additional resources as we expect they're going to be needed, such as instrument and controls personnel. Additionally, not unexpectedly, we expect to have equipment failures as we're performing testing, as we move down the path toward hot functional testing.

In anticipation of that possibility, we've added

additional spare parts to our inventory, to be able to deal with the issue of infantile failure.

As we have moved from bulk construction to system completion, the progress has become more challenging due to the precision of the work that's required to make completion.

On page -- on the next page, on page eight, Watts Bar is among the first sites to implement the Fukushima orders, and will be the pilot plant for the Fukushima inspection conducted by the NRC in January of 2015.

As directed in the Fukushima orders, we will achieve full compliance for mitigating strategies, the spent fuel pool instrumentation at fuel load. Implementation of the Fukushima project at Watts Bar 2 is nearing completion, and includes a new flex equipment storage building, diesel generators inside the flex equipment storage building, and on top of the battery board rooms on the auxiliary building, pumps connections, procedures and training.

Watts Bar is planning to implement a substantial amount of the cybersecurity rule. An initial assessment has been completed for Watts Bar on cybersecurity, and we are working to assure that Watts Bar Unit 2 is appropriately protected from cyber challenges prior to operation of the unit.

TVA has implemented new methodologies and analyses to more accurately evaluate the Tennessee River and the impacts at Watts Bar during a probable maximum flood event. Additionally, the transition to these new tools provides a consistent basis for our hydrology hazard reanalysis in support of the Fukushima

recommendation on flooding.

Watts Bar Unit 2 meets the current seismic design and licensing basis of the plant, and additional analyses have been performed to enhance our margin to seismic analysis. Watts Bar has completed the seismology screening in support of the Fukushima seismic recommendation.

On page nine, consistent with the Nuclear Regulatory Commission's direction for completion of Watts Bar Unit 2, we have taken the opportunity to implement operational and construction improvements at the site. We have used our own experiences, both from the Watts Bar Unit 1 construction and operation and the Brown's Ferry Unit 1 restart, as well as experience from the construction and the nuclear operating experience, to prepare for the completion of Watts Bar Unit 2, and to transition to an operating unit.

TVA's taken aggressive action to assure that systems, structures and components in Watts Bar Unit 2 have been purchased and installed, replaced and/or refurbished to meet requirements. Watts Bar has also established closure documentation that provides a basis for implementing the corrective actions to address historic issues.

Since the onset of the project, we have used a variety of tools and settings to continually assess the safety culture of the project, and to approve the safety culture of the Watts Bar Unit 2 construction organization. These tools include providing employee concerns staff for both the TVA staff and the contractor staff that are associated with the project.

Additionally, department level pulsing surveys have

been completed for the site, and periodic meetings with project personnel to make sure they understand the progress of the project, the progress of activities and to be able to listen to their issues and concerns.

Using this multiple tool concept has allowed TVA to more closely monitor the safety culture performance at Watts Bar Unit 2, where the population is more transient than in an operational environment. A pre-operational assessment of safety culture for the plant staff will be performed prior to fuel load at the Watts Bar site.

On the next page, on page ten, as Watts Bar Unit 2 comes to completion, the project workforce will be released. To facilitate this transition, we have conducted meetings with the effective workforce to inform them of the process of the project, and also to let them know the time frames for likely release from the project.

We have established out-placement tools to assist and support our workers, as they try to navigate from this project to future employment, and we've also met with the union councils to receive their insights and support for this process as we work with the union employees.

We've established a community action panel made up of 23 people from the Tennessee Valley. Members of the panel include area business leaders, local officials or elected officials including mayors, county commissioners or others that are associated with counties or cities; University of Tennessee graduate students; and individuals who represent the perspective of the local advocacy groups such as the Tennessee Environmental Council, the Union of

Concerned Scientists, Blue Ridge Environmental Defense League and the Bellefonte Efficiency and Sustainability Team, the Southern Alliance for Clean Energy and Sierra Club.

We have held three meetings and will continue to hold these meetings each six to eight weeks. Panel members bring their perspectives to these meetings. We talk about those perspectives, and it helps us to increase our understanding of issues and concerns associated with the advocacy groups or the city and county executives.

We have discussed with the panel the differences between the design of Unit 1 and Unit 2, and the activities that we have taken to keep the two units aligned and why that is important. We've also talked about the significant differences between the two units.

Additionally, we've discussed the process of storing used fuel on site and our plans to utilize the dry cast storage facility in the future at Watts Bar. With that, in the next slide Kevin Walsh, the site vice president, will cover his areas.

MR. WALSH: Thanks, Mike. I'm in Slide 11. In preparation for operating a second unit at Watts Bar, we have performed a broad array of activities to ensure our readiness. We've prepared organizational transition plans; we've performed operational readiness and self-assessments; and we've ensured processes, programs and procedures were evaluated and a schedule for development and revision was established to support start up of Watts Bar 2.

In addition, we've utilized multiple independent assessment teams to assure the adequacy of our approach, our

progress and the quality of the work we're doing. Those included McKenzie and Associates, the Nuclear Construction Review Board and the Nuclear Safety Review Board.

We've conducted a Watts Bar capability and capacity study. This study led to site and departmental realignment, specifically our transition team members are now embedded in the operating organization, responsible for implementing a transition to two unit operations.

Next slide, please. As a part of driving the transition, the operating organization has taken responsibility to ensure that at the time of fuel load, we'll be ready to operate two units at Watts Bar. We've developed and are executing transition plans for each department, covering worker qualifications, procedures, surveillances, training and monitoring.

To name a specific, currently the Maintenance Department has completed approximately 90 percent of the required qualifications, and is assessing and monitoring progress towards completion each week. The site has established the necessary organization and processes to ensure safe and reliable plant operation through structured oversight and leadership engagement.

Finally, Unit 1 managers are taking shared ownership of Unit 2 key milestones. This approach is designed to ensure proper coordination and communication as we progress through dual unit operation. An example of that would be the cold hydrostatic test that Mr. Skaggs discussed earlier, and that the Unit 1 operational senior license holder was the overall coordination and oversight for that test.

Next slide, please. We've ensured the staffing's at the appropriate level to support two unit operation. Today, we are above the staffing level for TVA's model standard organization for a two unit facility. We will implement a rapid response team to support fuel load in initial operations, and we plan to remain above the standard organizational staffing levels through commercial operation of Watts Bar Unit 2.

Training's been provided to site personnel in preparation for dual unit operation. License operator training has been completed, license exams taken, and dual unit licenses have been formally requested. TVA's corporate organization is providing governance and oversight of the Watts Bar transition to dual operating site.

This oversight is exhibited in the form of Watts Bar Unit 2 critical milestone status reviews at the plan of the day meetings, structured oversight plans for each functional area, and periodic executive management meetings, and these meetings with -- also with independent organizations, which were referred to earlier, and these include the Nuclear Safety Review Board and the TVA Board of Directors Nuclear Oversight Committee.

In summary, the site is very willing and able to operate two units safely and reliably, with a bias for improving performance every day. I'll turn it over to Joe Grimes.

MR. GRIMES: Thank you, Kevin, and I'll close our remarks using Slide 14. TVA appreciates the opportunity to present our progress and our path forward for achieving an operating license for

Watts Bar Unit 2. In summary, Watts Bar Unit 2 is being completed safely, with quality and to ensure excellence in operations following the completion of the licensing activities.

The process being utilized to license Unit 2 at Watts Bar is based on successful licensing basis implemented on Watts Bar Unit 1, as well as many other plants in the U.S. nuclear industry. The combination of construction, refurbishment, improvements, our use of lessons learned and the ongoing pre-op start up testing will demonstrate that Watts Bar Unit 2 systems, structures and components are like new.

TVA has the experience and the organizational capacity to operate multiple unit sites as part of our current operating fleet. We are ready to safely and to reliably operate and maintain two units at Watts Bar. Chairman Macfarlane and Commissioners, thank you for your time and attention. This concludes the TVA presentation.

CHAIRMAN MACFARLANE: Great, thank you. All right. Now we'll turn to Mr. Safer, and I believe that you have ten minutes.

MR. SAFER: Thank you Chairman and Commissioners. Thank you for asking to hear my views representing the Tennessee Environmental Council. I recognize the profound challenges of your jobs. I share your core goal of protecting people and the environment. My comments are presented with the intention of improving the protection of the people and the environment of Tennessee.

The Tennessee Environmental Council's vision is

building a sustainable Tennessee that embraces natural resources as the backbone of our communities, economy and quality of life for present and future generations.

Watts Bar Unit 2 is not the first new reactor of the 21st century. It is last old reactor of the 20th century. It is being licensed under the old 10 C.F.R. Part 50 rules. The troublesome ice condenser design dates from the 1960's.

Construction started in 1973. The original design has been modified with numerous cobbled together retrofits, including hydrogen igniters in containment, the supplemental condenser cooling water system and the unforeseen need to replace the steam generators, which requires breaking the containment open or cutting the containment open.

For these reasons, let's be clear. Watts Bar Unit 2 is not the first new reactor of the 21st century. It is the last old reactor of the 20th century. Ice condenser containment is a problematic design. It is far more likely to fail than large dry containments.

As early as the 1970's, the Atomic Energy Commission staff recommended the design be banned. Unfortunately, political and economic matters overwhelmed safety concerns. The book *Tritium on Ice*, which I have a copy here of by Kenneth Bergeron, an engineer at Sandia National Lab, which was commissioned by the NRC, or not the book but the -- the book is based on information that came out of a study, NUREG-1150 and other information.

But NUREG-1150, severe accident risk assessment in 1990 concluded that this design, along with the GE Mark I, were notable

for their poor performance in severe accidents. Today, we have seen the devastation caused by beyond design basis accidents at Fukushima GE Mark I reactors.

The ice condenser's smaller, weaker, thinner containment will fail catastrophically if subjected to a loss of coolant accident. The realities of surrounding a nuclear reactor with two to three million pounds of ice have proven to have significant unanticipated maintenance and operational challenges.

The many well-documented serious problems, questions and deficiencies with TVA's nuclear fleet resulted in the shutdown of all TVA's reactors in 1985. It was so dire it took the completed Watts Bar Unit 1 11 years of costly remediation to earn an operating license.

Questions surrounding early construction problems and the issues raised by whistleblowers compound the risk and uncertainty created by the old ice condenser design. TVA's whistleblower issues are hardly a resolved problem of the past.

In 2012, Watts Bar was near the top of all NRC regulated facilities, with 21 whistleblower complaints. Sequoia was not far behind with 19, and Brown's Ferry had 16. The red safety finding at Brown's Ferry from 2011 to 2014 was caused by a stubbornly deficient safety culture.

I'm sure the Commissioners are acutely aware of the catastrophic and tragic human, economic and environmental costs of a serious accident. Recent reports indicate that almost 25,000 people from around Fukushima will never be able to live again in their homes.

None of us want to see a similar situation in the Tennessee Valley.

The public deserves unbiased scientific studies on the consequences of major radiation releases. The National Academy of Science study on the lessons learned from Fukushima called for increased consideration of the risk from beyond design basis accidents, and better estimating the offsite consequences.

The study emphasizes the inadequacy of the design basis accident as a paradigm for preventing core melt accidents, and mitigating their consequences. Yet Watts Bar Unit 2 licensing relies heavily on the design basis accident paradigm.

Watts Bar 2's final environmental impact statement says the probability weighted environmental effects of a severe accident are small. It makes no sense to come to that conclusion on the basis of a theoretical assessment of the low risk of a severe accident.

Within the last 30 years, the world has now seen four reactors experience severe accidents, with subsequent massive releases of radiation, causing huge human and environmental impacts. Dam safety from heavy rain events and earthquakes is critical, and has not been adequately addressed over the years.

The NRC has taken steps to address that, but the NRC should take adequate time to review TVA's recently completed updated hydrology study, and to allow time for public review as well. There are literally scores of upstream dams, not just TVA dams, above Watts Bar, and 1,000 year floods have been occurring with alarming frequency.

I lived through one in Nashville and it was unbelievable

the amount of water that came out of the sky. Another Fukushima lesson ignored is using outdated, understated earthquake data in the hydrology study. Why is the NRC allowing that?

Watts Bar Unit 2 was originally licensed with the promise that the highly radioactive fuel waste would not remain on site beyond a relatively short time. Now, with the NRC's legally challenged continued storage decision, this deadly waste could be stored on site for hundreds of years or more.

That ruling is in conflict with federal regulations that prohibit new licenses from being issued without plans for a geologic repository in place. The operating license should not be issued until there is a credible plan which ensures absolute isolation from the biosphere.

Long term onsite storage is made more dangerous by the issues and unanswered questions around high burnup fuel and its storage canisters. Please complete the long term storage studies on high burnup fuel before allowing it to continue production.

TVA had a total of $1.18 billion in its reactor decommissioning fund for its six units at the end of 2012. That's an average of 200 million per reactor. The most recently shutdown reactors in the U.S. are at San Onofre, California. The official estimate is for $4.4 billion for decommissioning costs. That's 2.2 billion per unit.

TVA's latest cost estimate is 600 million per reactor. The difference is 1.6 billion per reactor. That shortfall could be as great as $9.6 billion. TVA reported to the NRC in 2009 that the market downturn resulted in its decommissioning fund falling below NRC

minimum required amounts.

Incredibly, TVA was not required to put any new money into the fund in 2010, '11 or '12, due to utilizing an external synching fund approach for funding assurance. The NRC should require an increase in the actual decommissioning fund balance, before allowing Watts Bar 2 to come on line.

The Price-Anderson Act only provides $12 billion of insurance coverage. Total economic cost for the Fukushima meltdowns is estimated to be 300 to 500 billion. The citizens of the Tennessee Valley deserve adequate insurance coverage for the risk. The ultimate lesson learned from the Fukushima meltdowns is to stop fissioning nuclei to generate electricity.

It is simply not necessary. Solar and wind power, along with energy efficiency, are the best energy sources for the 21st century. Recent rapid advances are evidence of their huge untapped potential. The Tennessee River system, river-reservoir system receives the effluent from all of TVA's reactors, Oak Ridge, Irwin, numerous coal plants, as well as Knoxville, Chattanooga and many smaller communities.

The environmental impact of operating Watts Bar Unit 2 should comprehensively consider the cumulative impacts on the river system.

Radiation monitoring systems in the United States are inadequate and inaccessible to the public. Building an online real-time radiation monitoring system should be a requirement at every reactor, but especially new reactors.

The $4 billion of new money being poured into finishing Watts Bar Unit 2 could have been put to far better use. We wish TVA and the NRC had listened to opponents of finishing Watts Bar 2 a long time ago, and abandoned this project. Moving forward, the NRC should cancel the construction license for Bellefonte Units 1 and 2.

We remain concerned about the threat of a major accident at an ice condenser reactor such as Watts Bar, or in fact any other U.S. reactor. On that basis, we ask that you deny the operating license for Watts Bar Unit 2. Thank you for this opportunity to raise these issues and for your consideration, and I want to thank you Chairman Macfarlane for your leadership, and good luck in your future endeavors.

CHAIRMAN MACFARLANE: Thank you. All right. Now we'll turn to questions from the Commissioners. We're going to start off with our new Commissioner Baran.

COMMISSIONER BARAN: Thank you, Madam Chairman. I want to start off by thanking Mr. Safer for making the trip, and the TVA folks for being here today. We appreciate it. As we all know, Watts Bar Unit 2 has a unique history. A construction permit was issued in 1973, but construction was halted around 1985 after significant quality assurance program deficiencies were identified.

I'd like to ask the TVA folks to take a minute or two to walk us through how your construction process has ensured that all the prior construction issues at Unit 2 have been addressed.

MR. ARENT: Do you want me to take that?

MR. SCAGGS: So we learned from the licensing

framework that we used on Watts Bar 1, and those were in the structure of a nuclear performance plan. There was corrective action programs and special projects that captured the issues that were identified as part of the Unit 1 construction and completion of testing.

Those were used, they are being used to drive our actions and the approach that we've taken with respect to construction and testing. So we're following the same guidelines that we utilized to finish the construction and licensing of Unit 1 on Unit 2.

COMMISSIONER BARAN: You've publicly announced a goal of fuel loading next June, June 2015. What steps has TVA taken to make sure that as that date approaches and schedule pressures increase, your employees continue to feel free to raise safety issues and concerns that they may have?

MR. SKAGGS: So we've -- at Watts Bar 2, we've used a multi-tiered approach to sustaining and improving safety culture. We've used two different approaches. We've used a series of internal assessments that help us understand our performance.

So that would include annual surveys by our major contractors that we utilize on site, and these surveys go out and touch all of the contract employees, to understand their perspectives associated with safety culture, work environment, unit performance and the use of the corrective action program to identify issues of quality or safety.

The next thing that we do on an annual basis is we perform organizational health surveys. We use the results of the organizational health surveys to understand what issues that we might

have on the site. We derive the results of the survey into a series of actions that we take to resolve those top issues associated with that survey response.

Then we use on a weekly/monthly basis a tool called a pulse survey, and that's where we go out and touch a smaller percentage of our employees, to see what their perspectives are with respect to the safety culture, work environment, human performance and the use of the corrective action program.

And then each employee that is leaving the site after their task is performed on the site, they get an exit survey, to look at those three areas again, safety culture, work environment, human performance and the use of the corrective action program, to make sure that we understand their perspective as associated with those programs, and their comfort, and the ease of which they're in use of those programs.

The next thing is that we have a series of external assessments that are on top of the independent assessments that we use. We derived three years ago a Nuclear Construction Review Board that's very similar to what the operating units use with respect to the Nuclear Safety Review Board.

One of the functions of the Nuclear Construction Review Board was to look at our safety culture work environment, look at -- to talk to the employees on the project and get their perspectives and confirm what we were seeing as a result of the internal assessments.

That Nuclear Construction Review Board is made up of

independent people from Watts Bar. They're typically industry experts in either construction, engineering or regulation. The next area -- we brought in a contractor, and that contractor is brought in two to three times per year that reports to the TVA Board of Directors.

One of their tasks is also to look at the safety culture work environment, human performance and use of corrective action program, and they, from an external perspective, look at the same areas as what I've talked about earlier.

Then the last thing is we've used for the last four years an independent firm to conduct an external assessment of safety culture work environment, so we can compare the results of it to the other two assessments that we've performed in an internal area.

So that there was a lot of discussion and a lot of talk, but it's all focused around making sure we understand how our employees, what their perspectives are, what kind of behaviors we're developing, how is the supervision and management treating the employees with respect to the project, and do we need to take changes, make changes to improve our performance or sustain our performance.

I would tell you that the latest results say that 98 percent of our employees are comfortable in bringing up issues, bringing up issues to their manager or supervisor or using the corrective action programs to document their concerns, either with safety or quality issues.

Our goal is to reduce that last two percent and continue to collapse it. We will continue to use the same type of program that I described until we finish up the project.

COMMISSIONER BARAN: Thank you. In recent years, some plants have had cooling water intake temperatures approach the technical specification limits, which required a change in those limits. I know that Watts Bar using draft cooling towers in its design.

But how has TVA ensured that with the operation of the second unit, the cooling water temperature limit will not become a concern for the Watts Bar units?

MR. SKAGGS: So we've looked at the history associated with the performance of or operating of Unit 1 with respect to river performance. We've also analyzed the performance of our cooling towers and the systems associated with our secondary systems. We did identify the need to add raw cooling water booster pumps to Unit 2, to improve the capacity and capability of the raw cooling water system.

We've also taken other design changes or modifications to improve our performance in that area. But right now, we feel very comfortable in our ability to meet our technical specifications associated with both units and the Tennessee River.

COMMISSIONER BARAN: In Mr. Safer's presentation, and really more in the briefing letter he provided to the Commission, he referenced some safety issues related to the ice condensers at the D.C. Cook plant. How has TVA incorporated the ice condenser operating experience into your construction of Watts Bar 2?

MR. SKAGGS: So the nuclear industry does a very

good job, in my opinion, of sharing operating experience from company to company, plant to plant, and as well as the other plants that use ice condensers. They've had some issues with operating or maintenance of the ice condenser, so has Watts Bar.

I believe we've learned from those issues, both onsite and off site. We have, with respect to Watts Bar 2, looked at our glycol system. We've improved the glycol system, the glycol chillers, the air handling units, and the actual condition of the ice condenser.

So I believe that we've taken both site action and action associated with the industry, with respect to the operation and maintenance of the ice condenser. We've folded that into the Watts Bar 2 project, and we've also folded those same type of actions into our operating unit on Unit 1. I believe that we are prepared to have good performance of our ice condenser.

COMMISSIONER BARAN: Mr. Safer, I wanted to give you a couple of minutes, the couple of minutes I have left, give you a chance to respond to what you've heard this morning. Do you have any additional thoughts you want to share with us?

MR. SAFER: I appreciate that the folks at TVA are doing as much as they can, but the reality, it's almost -- in my view, you're starting with a discredited design, with a lot of -- and with -- I mean who would think of putting three million pounds of ice around a nuclear reactor so you could make the containment thinner to save money?

We in the Tennessee Valley don't want nuclear power on the cheap. A lot of us don't even want nuclear power. But I think,

you know, the concerns are that the Brown's Ferry reactors are GE Mark I's, and we all know their history. While the ice condensers have performed in the real world, I mean at least there have been no major accidents, but the studies that have been done within the NRC just create a huge amount of concern that we're --

I mean gosh, I was in college when this thing was being designed, and at Vanderbilt, the only computer on campus, it was the size of this room. You know, the world has really changed, and I think that using such an old design really fundamentally undercuts a lot of the good work.

The bottom line for me is if the complexity, you know. They gave me a tour and I really appreciate that, and the complexity of the technology, all to boil water, is a great concern, and the ultimate effect, you know, goal is to have electrons streamed through a wire.

Now we can put solar panels. In 1973, that was a dream. Wind power to the extent we have it today, that was a dream. The world has changed and utilities around the world are getting a significant, much more significant amount of their electricity from clean, renewable sources, and that's the concern.

I'm a generalist and I've studied this, and I'm sure of my facts. But I look at the big picture, and to me, I wish TVA would take advantage of the opportunity of its structure and its original creation back in the 30's, as a visionary organization, to help the Tennessee Valley and really, were supposed to be a model for the whole United States, to provide a better level of environmental management and help the people in the Valley.

There are no stockholders that the agency is beholden to. It's all of us ratepayers and all the people in the Valley. So I just see a huge potential at TVA being squandered by the spending all of this money on this technology, which we've learned a lot about since 1973, since the 60's, and I think there's a better way.

COMMISSIONER BARAN: Thank you.

CHAIRMAN MACFARLANE: Okay, great. All right. My turn. So thank you all for coming, and thanks for traveling up here as well. Let's talk about the flooding and seismic assessments, and you guys talked about it sort of briefly. But I would appreciate just a little more detail on the results of your seismic hazard assessments, reassessments and the flooding and hydrology challenges that you have at TVA, and what you're doing, and this is all wrapped up in the Fukushima responses as well. So just some more detail would be helpful.

MR. SKAGGS: So Joe, why don't you start off with the hydrology.

MR. SHEA: Yeah. Let me talk about the flooding. The approach that we've taken on flooding fundamentally has three elements to it. The most important one is that we're structurally improving a number of the upstream dams that were referred to in the briefing, to make them more robust. In doing that, that supports us reanalyzing our current licensing basis.

CHAIRMAN MACFARLANE: So what's your time line on that?

MR. SHEA: It's looking at the spring of next year for

the completion of a significant number of those modifications.

MR. SKAGGS: Right now we expect to have the work done by April of 2015.

CHAIRMAN MACFARLANE: Okay, sorry.

MR. SHEA: And so that then is folded into our reanalysis of flooding as it relates to the licensing of Unit 2, and the updating of the licensing for Unit 1. It also supports the reanalysis for the Fukushima 2.1 flood hazard reanalysis. All of that will be folded in.

The results of the licensing basis analysis are under review by the staff, and that demonstrated that with the modification that we're discussing, that we will have no increase in the flooding onsite.

CHAIRMAN MACFARLANE: Okay, and what about seismic hazard reassessment.

MR. ARENT: So with respect to seismic, we have performed analyses, as we've prepared for the Fukushima response, with using the central and eastern U.S. seismicity. We've also performed studies using the ground motion response vector from 2004 to 2006, which in our case is more conservative.

We plan to be submitting the short-term analysis in December. We've already had meetings with the staff in the July time frame. What we're showing right now is for the -- preliminarily for the dams that we're crediting upstream, that we are in good shape.

CHAIRMAN MACFARLANE: Okay. When you did -- you submitted a seismic hazard reassessment last April-March, right?

MR. ARENT: That's correct.

CHAIRMAN MACFARLANE: And where did you fall in that?

MR. ARENT: So from that perspective, we had -- we were slightly below the curves that the NRC had developed, but we still were -- had margin between where we were with respect to structures, and then also we had margin with respect to certain areas with respect to --

CHAIRMAN MACFARLANE: So you're above your design basis?

MR. ARENT: We were above our design basis. That's correct.

CHAIRMAN MACFARLANE: Right. In low frequency or the high frequency or both?

MR. ARENT: In the high frequency area.

CHAIRMAN MACFARLANE: In the high frequency area.

MR. ARENT: That's correct.

CHAIRMAN MACFARLANE: And the high frequency is more relevant to --

MR. ARENT: Relays and equipment of that nature.

CHAIRMAN MACFARLANE: Electrical systems.

MR. ARENT: That's correct.

MR. SKAGGS: So we also took the high frequency data and looked at our components that might be effective at the plant. We did find, for example, some bolting on a 480 volt transformer, if I'm recalling correctly, and that bolting has been replaced as a result of that

analysis.

CHAIRMAN MACFARLANE: Can you say a little bit more? You know, I had the opportunity to visit Watts Bar this summer. Can you say a little bit more about the equipment, you know? As Mr. Safer pointed out, this has a long -- this project has a very long history, and a lot of the construction was done by 1985 and then it was halted.

So say a little bit about what you've done since then. I mean are you using all that equipment that's been sitting there for 30 years or what's --

MR. GRIMES: Mike, just walk through some of the focus on the, you know, the different components that have been refurbished, changed out, as well as what you've done with some of the passive structures.

MR. SKAGGS: So some of the improvements that we've made, the essential raw cooling water pumps have all been replaced and upgraded with a new set of pumps. So that new set of pumps allows us to have additional margin for two unit operation.

The eight pumps were in service for Unit 1, so it was not needed then. So the eight new pumps have margin from that perspective. We replaced the spare vital inverter, or we installed a spare vital inverter, and that gave us more margin with respect to single point failure.

We made upgrades in the switch yard. So we took the switch yard and learned from the lessons from one of our other plants that had to do a unit shutdown, and we redesigned the switch yard to add new equipment and to add new lines. We also upgraded our

Alpha and Bravo common stations service transformer with automatic load tap changers. So we've an additional qualified offsite power supply to the plant.

Like I said, we did install new raw cooling water booster pumps. We added diver barriers at our intake pumping station, that separated our intake pumping station so we can do maintenance online, which allows us to have a higher levels of margin of performance there.

We've upgraded the plant for a digital control system, where much of our systems are operated through a digital control process versus some of the older technology.

We've upgraded our in-core probes with stationery probes versus movable probes, with a new system that's provided by a contractor. We've changed out the reactor vessel level instrumentation system on Unit 2 with an upgraded model.

So those are some of the improvements that we've made. We've also gone through the equipment. For example, we've taken our large pumps and the reactor coolant pumps are new. We've taken pumps on the secondary side and sent those back to the vendor for refurbishments so they meet original specification.

We took all of our motors off of safety-related motors or large motors on pumps and sent those off for refurbishment, so their performance was meeting original specification. We've analyzed our passive and active features.

For example, we've taken our concrete, taken a hard look at our concrete, taken samples of concrete, performed tests of the

concrete to make sure it meets original specifications for strength and quality, and we've done inspections of the buildings and structures, to make sure we understand the aspects associated with the concrete features.

We've looked at the embedded steel. We've looked at -- the safety-related cabling has had testing to ensure the cable is able to perform. We've pulled miles, hundreds of miles of new cable within the plant. So those are just some of the examples.

CHAIRMAN MACFARLANE: Okay, thanks. That's helpful. So I want to spend a little time talking about the public outreach that you're doing, the Community Advisory Panel or whatever you call it. Everybody has some version of that.

MR. SKAGGS: It's Community Action Panel.

CHAIRMAN MACFARLANE: Community Action Panel.

MR. SKAGGS: Yes ma'am.

CHAIRMAN MACFARLANE: So you say you've had three meetings. But it existed before, you altered it a little bit. Just say a little bit more about what you're getting out of it, and then I'd like -- are you on it?

MR. SAFER: Yes.

CHAIRMAN MACFARLANE: Okay. I'd love you to comment on it as well.

MR. SKAGGS: So it was not -- it was not established before, and we saw a need for a Community Action Panel, as a result of the work that we're doing on Watts Bar 2. We thought it would be

valuable to include stakeholders associated with the Tennessee area, as well as the community, city and county executives, to get their perspectives.

So the -- you know, the objective of it was to take the time to talk about what we were doing at Watts Bar 2, associated with the quality and safety, and what actions that we were implementing to assure that we were maintaining the safety of our employees and the surrounding communities associated with Watts Bar.

Secondly, one of the objectives was is to understand issues and concerns of those stakeholders, advocacy groups associated in the area with Watts Bar. So what we did is we went out and invited 23 people that represent the stakeholder population. So there are 16 people that are with the county and cities, and there's six associated with advocacy groups.

The purpose is initially we took all 23 people, except one person that was unable to make the tour. But toured them on the plant, did a deep tour of the plant, so it took several hours, and took the time on the tour to explain the equipment, the components, the way -- as much as we can, the way the systems work, and then the actions that we're actually taking as we're walking on the tour, because being able to show what you're doing versus talk about it seemed to be valuable.

Then we've had these meetings to just talk about how Unit 1 is performing, what kind of concerns or performance issues might we have on Unit 1, and how we're striving for excellence. So Kevin talks about that with the panel, and then I'll talk about where we are with

respect to the project and completion of Unit 2 and the testing.

Then we open it up to talk about issues or concerns or topics that they would like to discuss, and so it's been very fruitful. We've had talks on -- discussions, for example, hydrology, the topic we just had; the testing of the plant, how we performed testing of the plant; how we assure, based on the testing program, how we assure the safety and the performance or the functionality of the systems and their components.

We've also -- and so some of the feedback that I've gotten from the 23 people is good discussions, good transparency. I appreciate the effort. We all are learning things. What I've learned is some of the county and city people that are part of the panel, they had questions that we hadn't fulfilled some of their questions or their answers to their questions.

Then we haven't taken the time to explain what we're trying to do, because at the end of the day, our goal is to have a very safe power plant with a high level of quality and reliability, and that's what we're all driving for.

CHAIRMAN MACFARLANE: If you could be really, really brief, because I'm asking the indulgence of my colleagues here.

MR. SAFER: Sure. I appreciate the participation. It's been wonderful, cordial atmosphere, and they've been encouraging. Mike has encouraged as many questions as I can come up with, and I can come up with a lot, and they've made every effort to answer them. So it's -- and the opportunity to tour the plant was much appreciated.

So as far as -- you know, and the people they put on

are Dave Lochbaum from Union of Concerned Scientists and others that have followed the process closely. I appreciate that -- the spirit of that whole part of it, and it is much appreciated.

CHAIRMAN MACFARLANE: Good, great. Thank you. Okay. We'll turn to Commissioner Svinicki.

COMMISSIONER SVINICKI: Well, I need to begin by redeeming myself with my colleague to my right here. I am sorry that I did not offer a public welcome to you. I was certainly raised better than that.

I'll offer in my defense the same thing that Chairman Macfarlane stated, is that you were sworn in a few weeks ago, and you have stepped, I think, so seamlessly into the tempo and process of what we're doing here. It's very impressive.

So to us, it's like you've been around for awhile, so I didn't think to do that. But certainly welcome to this, your first public Commission meeting. It's great to have you on the Commission. I thank also all of our external panel of participants. I have had the opportunity to observe a Watts Bar Unit 2 project for some years now.

I have the benefit of having had that time on the Commission, and I will say that spreading out in my observation of it over the course of so many years, when you visit five years apart.

I think that if you had just blindfolded me and flown me somewhere and kept me to the interior spaces, you might have been able to convince me recently that it wasn't even the place that I visited many years ago.

So I think that we hear, and I know we'll hear from the

staff as well these bland terms like replace and refurbish. To me, given my many years of observing this process, it understates hugely the undertaking that went on here. So I appreciate it, as you try in a very technical way to discuss all that went on.

I think unfortunately it isn't the kind of language that really gives people a sense of the significant change over time that occurred there. So I don't know what we do about that. That's the traditional communications challenge of trying to convey to those who stand further outside the process exactly what went on.

So I don't have as many questions. I probably have more questions for the staff panel, since I've been following this work over time. But maybe I'll ask. One of the uniquenesses here will be having operated Watts Bar as a single unit site for so long. I'm looking at you, Mr. Walsh.

This will be kind of a unique experience for the U.S. nuclear power program, to have so many years later a unit added in this way, and now of course Vogtle and Summer will likely be dealing with this in the coming years.

But where do you look in terms of setting up the very structured processes for turning systems over to operations, and migrating and evolving the station personnel for dual unit operation. How have you approached that and where have you looked for benchmarks?

MR. WALSH: We've approached that through a thoughtful way, in that we did capacity analysis. We did a study of how the site would need to manage the activities that would be required to

run -- transition from a single unit site to a two unit site.

I refer to a number of those assessments that we've done. We've taken advantage of our peers in the industry, many with two unit operating experience, and taken those insights and built those into the transition plans that I mentioned earlier.

Then we have a very active leadership team that's communicating daily and influencing folks, and focusing on really a different, a different way to operate the site in the near future. We're taking advantage of the activities that we have going on now, to practice those.

So a combination of analysis, doing very good assessments, developing plans and monitoring and utilizing outside folks to evaluate how we're doing. Then Mike had discussed a number of those external, you know, external peers in the industry that have come in and given us a look, given us advice and given us some feedback on how to better our plants.

COMMISSIONER SVINICKI: It has been mentioned some of those structured processes for sharing operational experience, in terms of the ice condenser questions that Commissioner Baran asked as well. So it sounds like that process has been involved here, as you look towards moving towards operation.

I think also when we talk about refurbishment, can you describe -- you mentioned, Mr. Skaggs, that refurbishment, you know, like motors and things were sent offsite.

Can you give some sense of the extensiveness of that? Is that like a complete tearing down of a piece of equipment and

building back up, and then in the case of replacement, what is the decision framework for refurbishment versus replacement?

MR. SKAGGS: So it is mainly toward the end of the spectrum, a complete tear down. So to do an adequate refurbishment, you have to go into the component and replace the consumable products. So for example, rubber, greases, oils, those all have to be replaced. So to get to those, the component in most cases has to be completely torn down. So not only does that help us in making these components like new, but it gives us the increased margin to reliability, because we want these components to run right, and we don't want to energize a component that's been sitting there for a while without the refurbishment. So it's extensive.

The other part of your question is safety-related, quality-related and the importance of safety components. Very close to all of those components were refurbished or replaced.

COMMISSIONER SVINICKI: Okay, thank you. I had an opportunity to introduce myself to Mr. Safer before the meeting, and Commissioner Baran made reference as well to the more extensive written statement, and I do thank you for that. I know that the structure of these meetings is such that presenters are not given as much time to cover all of the topics they would like to cover.

So I want to confirm to you that that will be part of this meeting record, and that was very valuable. I appreciate it. You did a very eloquent job of summarizing, I think, the main points from that.

I wanted, though, to -- it was very thought-provoking when I was reading it yesterday, and then thinking about it last evening.

There are some issues there that while I appreciate the perspectives of the citizens of the Tennessee Valley on basically what I would consider kind of their energy future and what they desire and what they prioritize, at the same time NRC jurisdictionally isn't in these projects making a determination on the need for power, the energy mix.

I know you're well aware, Mr. Safer, that some of those things fall outside of what NRC is going to be considering. But I still think it's very useful to have that in the record, to have that broader perspective.

But I would ask anyone from TVA, and maybe Mr. Skaggs, since you have a number of years on this project, why is it that this project -- you know, TVA obviously felt differently, that completing Watts Bar 2 was the right choice. I think you do integrated resource planning and you have to look at the broader energy mix, and how it is that you will meet your legal obligation to serve the Tennessee Valley, and it is a very integrated system, as Mr. Safer has talked about.

Can you react in terms of the contrast, of why, in light of a number of the things that Mr. Safer covered, this was the choice that TVA made, that they thought made sense?

MR. GRIMES: Yeah. I'll start, and then I'll let Mike give his perspective on his time on Unit 2. You know, TVA comes from a perspective, as you said Commissioner, of ensuring that we have, you know, cost effective energy sources for the people at Tennessee Valley.

It's a key part of the Tennessee Valley mission, and right now we're looking very broadly at diversified energy sources and

balancing our generation portfolio. As you look at that mix, it becomes very clear that a cleaner energy future is the best thing for all of us.

The Watts Bar 2 decision, very much a part of that broader, diversified portfolio, recognizing the carbon-free benefits of nuclear power, as well as giving us the opportunity to manage our broader load demand, and enable us to continue to focus on, you know, the closing of some of our coal plants, so that we can focus on more balanced and diversified portfolio, as well as a cleaner portfolio moving forward.

So that was all in consideration, as well as the cost impacts of that carbon-free energy to the people of the Tennessee Valley. Mike, anything to add to that?

MR. SKAGGS: So when we looked at completion of the unit, we looked at a range for the cost and schedule, and the reason -- part of the reason for the driver of that is lack of definitiveness on exactly how it was going to be finished. But also that gave us a range to make sure that the cost-benefit of the plant still served TVA and the TVA ratepayers, those that are buying our electricity.

So that was the basis behind our decision-making of why Watts Bar 2 is still a good product in the future for the TVA Valley. It does dispatch at extremely low rates for the customers.

COMMISSIONER SVINICKI: Well, and like I said, it's really maybe not fair of me to bring it up. It's outside the NRC's bailiwick. But my colleagues went one minute over, so I'm just going to tell a super quick story and close with this. I'll generalize it so I don't get myself into any trouble.

But we have -- we have some, I think, irresponsible folks who want to create an idea that there's no security at nuclear plants. There's, as we all know, a lot of security at nuclear plants. So one of the things is you can't get too close to one and start taking pictures without people being told.

So I won't say where this happened, but recently there was such an event, and the individual taking pictures was questioned. We as Commissioners receive these reports, at least I do. So this isn't, you know, unusual. People are curious about it. Often the plants can be seen from far away.

But what made it linger in my mind is it was an elderly gentleman, and he was questioned as to what he was doing, and he said he had worked on construction of this particular unit, and he desperately wanted to talk to his and to have pictures to show his granddaughter, that he had worked on this unit.

So on the one hand, I understand and I appreciate that there was the appropriate security response as a Commissioner, of course. But when I read that story, I thought, you know, there are a lot of people on the back end of these things, and it is significant to dedicate many years of your life to do something.

So I thought that that gentleman likely, if that was a true story, I hope it was, that he had a legitimate pride in something he had given years of his life to. So maybe that's why I asked just kind of why we can have this divergent view about what's the right thing for the citizens of the Tennessee Valley. There's different views on that that are very, very sincerely held. So I appreciate that. Thank you,

Chairman.

CHAIRMAN MACFARLANE: Okay. Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Chairman. Let me start off by joining Chairman Macfarlane and Commissioner Svinicki in welcoming Commissioner Baran. We've had a number of chances to be together since you've been here. I completely agree with others who have commented on your stepping up to the plate right away. I've been very impressed, and Jeff, we're very happy to have you here.

Thank you all for being here today. I think this is an important topic. I had a chance to visit Watts Bar three times as a Commissioner in 2010. It was the first nuclear plant I visited as a new Commissioner. 2011, after Fukushima with Senator Alexander. Then most recently in January of this year, to look at specifically construction.

I look at Mr. Safer, because I had the same concerns and questions that you raised about, you know, is this an antiquated set of pieces of equipment that's been sitting there in moth balls for 30 years, that somebody's dusting off with some chem wipes, that kind of thing.

So I look at Mr. Skaggs now, because I specifically asked him in January of this year to take me and show me everything in the containment building that was replaced or refurbished. As a former submarine officer involved with repairs and depot modernization periods, SRAs, -- overhauls.

I had some familiarity with how Naval nuclear propulsion program approaches equipment repair and replacement based on aging, and those other concerns. So I -- we walked up and down a bunch of ladders there in January inside the containment for over an hour and a half, just looking at what -- pointing out, saying Mike, tell me what's new? Show me that.

It was a very helpful lesson learned from me. I hope that your tour had some of that, Mr. Safer did it, because I think like we said earlier, your seeing it on paper doesn't really make an impression, but seeing it in person does.

I appreciate that Mr. Skaggs talked, went down a list of things that were replaced when the Chairman asked a question about that, and I appreciated that more explicit listing.

I wanted to maybe ask a related question. Just at a high level, what kind of standard did you use -- was it industry standards, ASME, EPRI? I'm trying to look at what were the standards applied by TVA in deciding what components to replace or not? Can you talk about that for a minute?

MR. SKAGGS: Yes sir. So the standards for Watts Bar 2 are very well developed, and we have internal standards that have been developed over time. They're design specifications per se that describe the functionality and the capability that our equipment and component systems need to perform to. Those are based on regulations, EPRI standards, operating experience.

Secondly, the refurbishment program also relied a lot on the generic aging/lessons learned report that was issued by EPRI,

that provides insights on the types and different types of perspectives on aging and the degradation associated with aging. So we use that to apply to the component systems and equipment for pre-service degradation. So we used that.

COMMISSIONER OSTENDORFF: Okay. That's helpful, and I encourage you, as I'm sure you have done in your outreach to the local community, to ensure that that's articulated, because I think it's not sufficient to say well, we just decided to do this or that without any reference to external standards. I think that external standard review by EPRI and the GALL type generic aging lessons learned is really important.

MR. SKAGGS: Yes sir.

COMMISSIONER OSTENDORFF: I appreciate Commissioner Svinicki's closing with the story that I had also read. So now I'm looking at a former shipmate of mine, Joe Kelly back there. Joe and I have been on a submarine together 26 years ago. Is that right? He was involved directly in nuclear testing. I was the executive officer on a pre-commissioned unit in Newport News, the SSN-750.

So I have a lot of memories working with Joe many years ago, in bringing that newly-constructed ship to service and operation and taking it on sea trials. So I want to use that frame of reference to ask, Mr. Skaggs, you talked about the open vessel test and the cold hydrostatic test that was recently done.

Can you talk briefly about any problems you saw during those tests, and what your experiences were with those evolutions?

MR. SKAGGS: So yes sir. When we performed open vessel testing, we had a spiral wound gasket that was installed on a flange face that extruded slightly, and we found that after the performance of the open vessel testing. So that had to be replaced, and we found that that had been installed incorrectly.

So they've been reinstalled correctly now, and we had to go back and verify some flow values. That's been completed. That was the issue we had with open vessel testing.

Then on the cold hydrostatic test, we did have a test header valve that leaked through, and that was the extent of the significance of the issues that we had. That was identified as we were pressurizing up and we saw water coming out of a test header line.

COMMISSIONER OSTENDORFF: I appreciate that. I've done at least two cold hydros in my own experience. I think I had more problems than you experienced.

MR. SKAGGS: This will be my third, and this one was by far the best performance that I have been associated with.

COMMISSIONER OSTENDORFF: Let me turn, and you lead us to TVA. There's a question -- one question for TVA and one question for Mr. Safer. Again, older design acknowledged; refurbished a lot of components. Can you talk about any challenge you had in parts availability? Anybody, whoever wants to address that from TVA?

MR. SKAGGS: I'll talk about it. We are challenged with -- so the design changes that we've made with respect to obsolescence of components, equipment, we're not challenged with

that, because we make the decision change knowing that we can get the parts.

We are challenged somewhat in some of the safety-related pumps, and we're challenged in the refurbishment of some of the larger valves and equipment. In fact that the challenge is that type of work is not in large demand, and so we were challenged from that perspective to return the equipment back to original specification.

The machining of the equipment, etcetera, was the challenge, and being able to have the manufacturers to meet our demands and our schedule time frames that we were looking for.

So we've been able to work through it, and as a result, we did learn some lessons a couple of years ago, and we spent several, tens of millions of dollars in buying additional critical spare parts for the plant, and the fact that we expected that we'd have some equipment that would fail on initial performance runs, for example.

So we're at the final stages of getting all that critical spare parts on site.

COMMISSIONER OSTENDORFF: Okay. Thank you.

MR. SKAGGS: Yes sir.

COMMISSIONER OSTENDORFF: Mr. Safer, I appreciated your October 23rd letter to the Commission in advance of this meeting. That was very helpful for us to, in advance of your presentation, have a more fulsome understanding of your concerns and questions. So thank you for sending that.

I wanted to ask you from where you sit on the Tennessee Environmental Council and part of the outreach. I can't remember -- what was the name of the group?

MR. SKAGGS: Community Action Panel.

COMMISSIONER OSTENDORFF: Action Panel. Do you feel like you've had reasonable or appropriate accessibility of information from TVA?

MR. SAFER: Yes. It's been -- it was surprising honestly, but Mike -- and we're on first name basis after two meetings -- has been quite gracious and after the first meeting, and I had numerous questions then. He came up and said thank you for the questions, and really encouraged.

I was asking, you know, questions about the tritium production at Unit 1 and for weapons production, and questions about the hydrology, and as -- and about the ice condenser, and anything that -- and high burnup fuel. Anything that couldn't be answered on the spot, the next meeting, there were the people that could answer it in the room at the table.

We didn't quite have time to get through all of it, but I would say yes, absolutely.

COMMISSIONER OSTENDORFF: Okay, thank you. Thank you all. Thank you, Chairman.

CHAIRMAN MACFARLANE: Okay. Any additional questions?

(No response.)

CHAIRMAN MACFARLANE: No? All right. We're

going to take a five minute break while we switch panels, and then we'll reconvene.

(Whereupon, the above-entitled matter went off the record at 10:21 a.m. and resumed at 10:30 a.m.)

CHAIRMAN MACFARLANE: All right, I think we're ready to begin the second half with our NRC staff panel.

I will turn things over to Mark Satorius, our Executive Director of Operations and he can introduce the panel and get us going. So, go ahead, Mark.

MS. SATORIUS: Thank you, Chairman and good morning to you and to the Commissioners.

At the risk of sounding like a broken record, Commissioner Baran, on behalf of the staff, I would like to congratulate you on your first public Commission meeting and we're looking forward to seeing you at many more.

Today the staff will provide you a status on the briefing of the efforts the NRC has undertaken to license the Watts Bar Unit 3 -- I'm sorry, Unit 2, including licensing and inspection -- I wonder what kind of slip you'd call that?

CHAIRMAN MACFARLANE: Off to an excellent start, Mark.

MR. SATORIUS: I don't think that's Freudian, but I think that's a slip.

The Watts Bar Unit 2 including licensing and inspection activities from NRC's staff's perspective.

On September the 29th, 2014, the staff provided the

Commission an information paper on the status of Watts Bar Unit 2 and that was made publically available on the 15th of October.

I would like to first acknowledge the significant contributions from the many offices in the agency that participated in the numerous activities related to this endeavor.

Besides the Office of Nuclear Reactor Regulation and Region II who are with me today at the table, I'd like to acknowledge the Office of Nuclear Security and Incident Response for their security and emergency preparedness reviews, the Office of Research for their contributions in the individual plant examination and individual plant examination for external events reviews, Region I for their review of the Part 30 and Part 40 licenses, the Office of Nuclear Material Safety and Safeguards for their review of the Part 70 license and the Office of New Reactors for their oversight and management of the budgets.

The NRC has completed significant parts of its review on the Watts Bar license application. This has been in the midst of an ever changing and dynamic environment the last couple of decades since the last nuclear power plant was licensed in 1996.

The comprehensive construction inspection combined with the licensing review and staff findings have played a very important and positive role to ensure that Watts Bar Unit 2 is built as designed for safe operation.

So, now, I'd like have Bill Dean describe what you'll be hearing more in detail from the staff.

MR. DEAN: Thank you, Mark.

I, too, share a first today with Commissioner Baran.

This is my first Commission meeting as the Director of NRR, so Commissioner Svinicki, I hope you take it easy on me with all the questions you have poised for the staff.

COMMISSIONER SVINICKI: I'm getting soft in my old age.

MR. DEAN: Okay, good, thank you.

So, Mark did a great job in reflecting on all the offices and other regions that have contributed to supporting this project over the last several decades.

I do want to be a little bit parochial, right now and reflect on the contributions of the wide swath of individuals, staff and managers within NRR who have contributed to this project over the last several decades, many of them represented in this room by various staff and managers, the Division of Engineering, Division of Safety Systems, Division of Risk Assessment, Division of License Renewal, Division of Inspection and Regional Support, the Japanese Lessons Learned Division and then last, but not least, Division of Operating Reactor Licensing represented here by Justin and Michele. It really has been a true team effort involving many parts of this agency.

Next slide, please?

So, in light of the fact that the World Series concluded last night, those of you who didn't stay up late, San Francisco beat Kansas City 3-2 in a good game, I'd like to introduce the members here at the table as sort of a batting order.

Our number three hitter is Vic McCree, my esteemed colleague from Region II, the Regional Administrator there. Vic will be

talking to you in a few minutes about the inspection program that was put together to oversee the refurbishment and construction activities at Watts Bar Unit 2 to make sure that the licensee was implementing and planning their activities properly and safely.

To my right, Michele Evans, she's the Director of the Division of Operating Reactor Licensing, so she's our number two hitter. She's going to talk to you about the Part 50 licensing process.

The Commission, obviously, over the past several years has been involved in the Part 52 licensing process for new reactors, so she'll give you a bit of a refresher course on Part 50 and then talk about the history of Watts Bar and how Watts Bar fits within that context of the Part 50 licensing process.

To her right is Justin Poole. Justin is the Senior Project Manager for Watts Bar 2. He's going to provide you a more specific insight regarding the unique regulatory and licensing framework that has been put in place to support our technical and licensing reviews of Watts Bar Unit 2 through its refurbishment and construction activities, give you a sense of some of the key milestones that remain before we are in a position to be able to consider licensing of Watts Bar Unit 2 as well as some of the outstanding licensing issues that are still at play and I think you probably are interested in that.

And then last, but not least, our clean up hitter, Tomy Nazario. Tomy is the Senior Resident Inspector at Watts Bar responsible for really being the agency's eyes and ears and boots on the ground with all the various inspectors from Region II that have been on site that provide, you know, the perspective that is needed relative to

what's going on on a day to day basis at the site. So, he'll talk to you about the inspection program as it's been implemented and some of his insights about how that's gone.

Next slide, please?

As indicated in the dialogue before, this has been a very substantial project with the expenditure of many, many resources. And so, in order to help, the agency focuses attention on how to manage this project. We formed a group called Watts Bar Reactivation Assessment Group or WRAG, of which Michele and Bill Jones, who's the Division Director in Region II for construction projects chair.

The WRAG is a very vital organization to facilitate the communication and collaboration that's needed on this project between the staff and managers in Region II and all the headquarters offices that are involved in the project.

They also will serve a very valuable and important role to be able to provide a recommendation to me when the inspection and the licensing activities are complete and construction activities are complete at Watts Bar 2 so that we can then begin the process of making a determination as to whether to license the plant for operation.

I will say that I'm very pleased that the fact that all the Commissioners have been to the site fairly recently. I know Commissioner Baran, you're going in a couple of weeks.

I had the privilege and pleasure of being able to go to Watts Bar several weeks ago with Vic and members of his team. And again, like you indicated, Commissioner Ostendorff, very impressive in

terms of being able to get into those spaces that, at a typical operating plant, you can't get to.

And just as a side note, the first inspection that I ever did as an NRC inspector was in 1985 at Watts Bar and I do want to clear up any potential rumors that might exist that it was my inspection findings that resulted in the long delay of us being able to consider Watts Bar Unit 2.

So, with that, let me turn it over to Michele.

MS. EVANS: Okay, thank you, Bill.

Good morning, Chairman, Commissioners.

Next slide?

All right. Unlike the recent licenses issued by the Commission, the V.C. Summer and Vogtle, which were done under Part 52, the licensing of Watts Bar Unit 2 is being done under Part 50.

All operating nuclear power plants in the United States were licensed under this two step process described in Part 50.

First, as an application is submitted for a construction permit that would authorize construction -- excuse me, first, an application is submitted for construction permit that would authorize construction of the proposed facility.

The focus of this stage of the staff's review is on the preliminary design in the facility and on the suitability of the proposed site. During this stage, a mandatory hearing is required.

The second stage of the review involves the evaluation of an operating license application in which the staff reviews the final design of the plant, verifies its construction and inspects the testing,

operations and emergency preparedness aspects of the review. For this second stage, an opportunity for hearing is offered but not required.

The initial construction permit for Watts Bar Unit 2 was granted in 1973. When TVA informed the NRC of its plan to complete Watts Bar Unit 2, they chose to proceed under the Part 50 licensing process.

So, once the staff believes that the second stage of the review is substantially complete in accordance with Commission regulations and policies, the staff plans to request the authority for the NRR office director to issue the operating license for Watts Bar Unit 2.

The staff would request this authority through the submittal of a Commission notation vote paper and the staff expects that this vote paper would be submitted within 30 to 60 days before the final decision on the issuance of the Watts Bar Unit 2 license could be made.

Next slide?

So, Watts Bar Unit 2 has a unique licensing history which defined the project once TVA announced that it had plans to finish construction. The next presenter will go into detail on how the following events shaped the staff's review.

In 1971, TVA submitted a request for construction permits for Units 1 and 2 which the staff reviewed and issued in 1973. Referring back to my previous slide, this was the completion of the first stage of Part 50.

In 1976, TVA submitted the operating license application for Watts Bar Units 1 and 2 and the staff began reviewing

and documenting findings in safety evaluation reports starting in 1982.

Regarding hearing opportunities, the mandatory hearing during the construction permit phase occurred in 1972.

After the operating license application was submitted an opportunity for hearing was provided but there were no admitted contentions.

Construction at the site stopped around 1985 when a large number of deficiencies were identified. So, when TVA resumed construction around 1990, the focus was put on completing Unit 1.

In late 1995, the staff issued a low power license for Unit 1 and a few months later, in February of 1996, the full power license was issued.

During this time, Unit 2 was being maintained in a deferred status. Then in 2007, TVA notified the NRC that it intended to resume construction on Unit 2.

I'll now turn the presentation over to Justin Poole to discuss the licensing framework and the status of our licensing review.

Thank you.

MR. POOLE: Thank you, Michele.

Good morning, Chairman, Commissioners.

Next slide, please?

After formal notification of the intent to restart construction at Watts Bar Unit 2, the staff provided the Commission a paper regarding policy issues on the handling of the review for Watts Bar Unit 2 given its licensing history.

The Commission responded with a staff requirements

memorandum 07-0096 providing guidance to the staff on these issues.

In general, the guidance from the Commission was agreement on the use of the Unit 1 licensing basis as the licensing basis for Unit 2. The staff was also directed to encourage TVA to adopt updated standards for Unit 2 where it would not significantly detract from the design and operational consistency between the two units.

In the staff requirements memorandum, the Commission also directed the staff to renotice the hearing opportunity on the operating license review given the long delay.

The staff renoticed the application in 2009. Two contentions had been admitted related to the environmental review but had since been resolved or withdrawn.

NRR office instruction LIC-110 was created to implement the direction given to the staff by the Commission through the staff requirements memorandum. The office instruction establishes the organizational review team, the roles and responsibilities of the team members, the process workflow, management controls and process for coordinating the review between other offices.

The office instruction also lays out the different actions to be completed as part of the operating license review from putting together the safety evaluation reports to the final environmental statement to the final steps for issuing the operating license.

The office instruction was intended to guide the staff through the application to ensure a complete and high quality review.

In an effort to identify the licensing basis review that had been done and approved concurrent with the operating license for Unit 1, TVA submitted its framework for completion of construction and licensing activities for Unit 2.

The staff reviewed the proposal and documented its assessment of the regulatory framework for Unit 2 in October of 2008.

The staff then published in supplemental safety evaluation report 22 a table listing all the safety evaluation report topic items and their status as to whether the staff considered these items to be either open or resolved.

The table provided the basis for TVA to submit the necessary information for the staff to complete its safety review of the Unit 2 operating license application.

Next slide, please?

Once the framework had been established, the staff began its review of the updated operating license application. Following the publication of the supplemental safety evaluation report 21, five additional supplemental safety evaluation reports were issued by the staff documenting safety conclusions.

At this time, the majority of the staff's safety review has been completed. Some open items remain and I will go into some detail as to the major topics remaining.

In 1978, the NRC issued a final environmental statement related to the operating license for Watts Bar Unit 1 and 2. Because TVA did not complete Unit 2 as scheduled, the NRC regulations in 10 CFR 51.92 required the staff to prepare a supplement

to the 1978 final environmental statement.

In preparing this supplement, the staff held two scoping meetings near the site to obtain comments from the public as well as reached out to federal, state, Tribal, regional and local agencies.

In October 2011, the staff published its draft supplement to the final environmental statement. Again, the staff reached out via public meetings and through the local agencies in order to gain public comment.

Following the comment period, the staff considered and addressed all comments received on the draft in order to publish the final version of the supplement. This was published in May of 2013.

Next slide, please?

One of the major items remaining in the staff's safety review is hydrology, specifically, the design basis flooding event. As hydrology affects both the operating unit and Unit 2 and to keep with the Commission's direction found in the staff requirements memorandum, the staff is currently reviewing a license amendment for Unit 1 to update its probable maximum flood level seen at the site during a design basis event.

Once completed, this will form the basis for Unit 2 and the two units would have the same design basis.

TVA submitted new information regarding this review at the end of September and is still currently under staff review.

The other major item remaining on the staff safety review is the review of the as-built fire protection report. The staff

previously reviewed and approved the as-designed fire protection report in 2013 but as construction continued, fire areas and operator manual actions have changed.

The staff needs to review these changes and evaluate their impacts to the safety evaluation previously published. TVA submitted this information in September and is still currently under staff review.

In November of 2013, the staff met with the full ACRS committee. Following that meeting, the committee issued an interim status letter. The letter identified to the staff those items which the committee requested the staff to present upon closure.

Two of the items I just mentioned, hydrology and fire protection were both identified in that letter. There were five other items that were identified by the committee in this letter as well.

The staff is finalizing its review of these items and will document these reviews in supplemental safety evaluation reports. Currently, we expect to issue the next report in December of 2014.

As I mentioned earlier, the staff had published its environmental review in a supplement to the final environmental statement in 2013. Since that time, the agency, in response to a Court ruling, revised the previous waste confidence rule by issuing the continued storage spent fuel rule.

With this new rule in effect, the staff is evaluating the implementation of this rule to ensure the necessary NEPA requirements have been met.

On March 12, 2012 the NRC issued orders to operating

license and construction permit holders requiring them to take actions that the NRC determined would provide substantial increase to the protection of public health and safety based on the events that occurred at Fukushima Daiichi power plant in Japan.

Of these three orders, two are applicable to the design of Watts Bar Unit 2, as you heard earlier from TVA, the spent fuel pool instrumentation mitigating strategies order.

These orders state that the holder of a construction permit must complete full implementation prior to issuance of an operating license and that the holder shall report to the Commission when full compliance is achieved.

This month, TVA submitted a compliance letter with open items for the two orders and the staff expects to receive from TVA the full compliance letter in December of 2014.

The NRC staff intends to issue its safety evaluation and perform inspections to document the NRC staff's review of the actions taken for Unit 2 prior to the issuance of the operating license.

I would like to note that the information requested in the March 12, 2012 50.54(f) letters for the near term task force recommendation 2.1 regarding the re-evaluation of seismic and flooding hazard is not needed prior to the Watts Bar Unit 2 licensing decision.

This approach is consistent with other reactors in that it recognizes the re-evaluations require licensees to analyze conditions beyond their current licensing basis and are complex and may take several years to complete.

In addition, because Watts Bar Unit 2 is required to comply with the mitigating strategies order prior to receipt of the unit operating license, verification that Watts Bar complies with the mitigating strategies order will provide additional insurance that TVA has credible strategies in place to protect against beyond design basis events.

Next slide, please?

The major milestones remaining for the staff to accomplish are shown in this slide. Starting on the left, the first milestone is ACRS with a subcommittee currently scheduled for January of 2015 and a full committee currently scheduled in February of 2015.

Assuming the staff is able to satisfactorily address the committee's concerns and a letter of recommendation is issued, the next milestone is the Commission Notation Vote Paper which Michele described earlier.

Should the Commission grant the authority, the next milestone shows that the office director of NRR would receive a report from the Region II administrator on the status of construction inspection activities.

This report will provide significant insights, inspection items that remain open and the Region II administrator's recommendation regarding issuance of an operating license. The office director of NRR will take this information as well as other information into account before making a finding as to whether or not the requirements of 10 CFR 50.57 have been met and, therefore, issue

the operating license.

That has completed my portion of the presentation, I will now turn it over to Victor McCree to provide an overview of the construction inspection program.

MR. MCCREE: Thank you, Justin.

Good morning, Chairman, Commissioners.

Bill mentioned in his opening remarks an appreciation for the many folks supporting this important project. In addition to Tomy, I'd like to identify three key contributors to the Watts Bar inspection program who are seated behind me today.

First, Bob Haag, the Region II Branch Chief who's been the heart and soul of our efforts focused on Watts Bar 2; Chris Even, a Senior Construction Project Inspector who's made significant contributions to our management of the close out of open items at Watts Bar; and James Baptist who has done a fantastic job in leading the planning and implementation of inspections for pre-operational tests.

Also, Fred Brown, the Deputy Regional Administrator for Construction in Region II is here today and he's brought exceptional leadership to the new construction efforts in Region II.

There are a number of others, as Bill alluded to, who are not here today, but I would characterize them as the regulatory tissue that connects and enables and informs safety and licensing decision at Watts Bar.

Next slide, please?

As Michele discussed, Watts Bar Unit 2 has a unique

history on the decision to license the plant that's spent an extended period of time in construction including deferred construction is not one that we take lightly.

Fortunately, Region II has had some experience in this area having overseen the completion of construction and operational readiness at Watts Bar 1 in the mid-1990s and the restart following an extended shutdown of Browns Ferry Unit 1 in the 2007 time frame.

Working closely with the Office of Nuclear Reactor Regulation, Bob and his staff developed a customized inspection program that was completed in 2008 and is formalized in Inspection Manual Chapter 2517.

In developing the customized inspection program, we wanted to provide a strong basis for assurance of the following: one, that the construction work that was done on Watts Bar Unit 2 in the '70s and '80s was or would be adequately inspected with the results documented in publically available documents.

Secondly, that the quality assurance problems that contributed to the suspension of construction in 1985 and deferral of construction in 1992 would be adequately addressed by the applicant and also that the period of extended deferral would not reduce confidence that the installed safety systems will function as intended.

And thirdly, that appropriate inspections would be performed to ensure the remaining construction activities, pre-operational testing, operational readiness programs and new regulatory requirements are fully met.

Tomy will provide the status of the implementation of

our inspection program, but I do want to briefly touch on three specific points.

The first is the thoroughness with which we looked at the inspections that have been previously completed. As required by Inspection Manual Chapter 2517, we essentially performed a comprehensive reconstitution of the inspection records similar to what was done for Watts Bar Unit 1 to ensure that all critical inspection attributes were documented as having been successfully completed.

Where gaps existed between inspection requirements and the documented inspection record, we identified and are tracking specific inspections that need to be performed.

An example of a gap was Inspection Procedure 51063 which deals with the electrical cable installation and has a requirement to inspect cable terminations. Because of the documented inspection record did not meet minimum sample size, we have inspected additional cable terminations.

The second point involves historical quality assurance problems that caused suspension of construction in the mid-1980s. To address these quality assurance problems, TVA developed the Nuclear Performance Improvement Plan which Mr. Skaggs mentioned earlier that includes 29 corrective action programs and special programs and covers areas such as welding, electrical issues and concrete.

This plan which NRC staff reviewed and found acceptable in 1989 was implemented successfully in the completion of construction of Watts Bar Unit 1.

This experience suggests that if TVA implements the plan similarly, the historical quality assurance problems can be properly resolved for Unit 2 as well.

In addition, because of the lengthy period of deferral of construction of Unit -- deferred construction of Unit 2, TVA developed a refurbishment program which was mentioned earlier to ensure that the design and licensing basis, including original equipment design specifications would be met.

To confirm the acceptable implementation of each of these programs, we created a detailed inspections plan and a new inspection procedure which specifically covers refurbishment activities.

Finally, in addition to the work completed in 2008 to determine what needed to be inspected to support a licensing decision, the Watts Bar Reactivation Assessment Group, or WRAG, serves as a joint forum for identifying new or emerging issues that the region should inspect under Manual Chapter 2517.

The cybersecurity requirements which were published in 2009 and the orders issued after the 2011 Fukushima Daiichi accident are examples of new regulatory requirements that have been captured in this living process.

To summarize, I feel confident that the customized inspection program for Watts Bar Unit 2 is comprehensive and robust. It is also a practical approach that, after successful implementation of our inspections, will allow us to discern with reasonable assurance whether the facility has been constructed in accordance with the licensing basis and can be operated safely.

Next slide, please?

So, what are we doing and what am I doing to ensure that we successfully implement our inspection program?

Well first, we've ensured that the people assigned to oversee the construction of Watts Bar Unit 2, including Bob, Tomy, Chris and James are top notch people and high performers. They've received training to prepare them for the unique construction environment and program guidance to focus their efforts.

Results also provided clear expectations and strong management support. For the last year, either I or Fred or Len Wert, the Deputy Regional Administrator for Operations in Region II have visited the site on a monthly basis. We visit to check on the status of inspection activities and open item closure and ensure that the resident inspectors have the support that they need.

The graph on this slide demonstrates the significant amount of inspection resources Region II has applied to Watts Bar Unit 2. The hours are reported by calendar year consistent with the practice under the reactor oversight process for operating reactors.

As you can see, the inspection related hours have varied since resumption of construction in 2008. We've adjusted the level of effort to match the construction activities and effectively use our construction inspection resources.

For example, in 2012 when TVA reduced the amount of construction activities while they re-evaluated the status of the project, we temporarily decreased the number of resident inspectors from four to three. And the dramatic increase in the applicant's

activities after that time to complete systems and our associated inspection efforts is clear in that calendar year. We expect that next year's effort -- level of effort will be comparable.

I would note that one of the challenges at both Watts Bar and the AP1000 construction sites has been schedule volatility. To partially mitigate the schedule volatility, we've identified four construction residents at the site and we are regularly supplementing them with additional region-based inspectors on one or more week assignments.

Both our region-based inspectors and the resident inspectors have been very adaptive and agile in planning and moving their inspections to match ongoing inspection activities.

In summary, we believe that we've developed a comprehensive construction inspection program. Additionally, based on the results of our inspections and my own interactions and involvement, I'm confident that our inspectors have effectively implemented the program to date.

As I indicated, we are well prepared to inspect the remaining inspection planning and scheduling items. We know what pre-operational testing and operational readiness inspections need to be performed and we have plans in place to complete those inspections.

I'm also confident that we have the tools, the plans and the resources to continue to handle the volatility of construction schedules even as the pace of construction accelerates at Watts Bar Unit 2 and the AP1000 sites.

By the time TVA is ready to load fuel, I'll be in a position to make a sound and well-informed report to Bill regarding whether Watts Bar 2 is substantially completed, constructed in accordance with its licensing basis and can be operated safely once an operating license is issued.

At this point, I'll turn it over to Tomy Nazario to discuss the status of inspection activities.

MR. NAZARIO: Thank you, Vic.

Good morning, Chairman, Commissioners.

First, I'd like to highlight what Vic just mentioned and reference briefly Bill Dean's baseball analogy. This truly has been a collective team effort. We've devoted a significant effort for Watts Bar Unit 2 inspections.

On a weekly basis, I see this inspection effort, it's not unusual to have all our spaces in our construction trailer filled with resident and regional inspectors.

Most of the activities involving classic construction activities are now complete. There's still electrical construction work that is ongoing and a couple of major systems that still have assembly work remaining as part of construction.

To facilitate the implementation of the Watts Bar Unit 2 inspection program, we developed what we call the inspection planning and scheduling database, also known as IPNS.

This tool is a dynamic tool used to track and plan our inspection of approximately 550 inspection items. This database also serves as a collection of historical and current construction inspection

items which includes inspection procedures, corrective action programs, special programs, generic issues, historic violations allegations and unresolved items.

As Vic mentioned earlier, we thoroughly screened and reviewed these historical items to ensure that we developed a comprehensive basis for the items in IPNS. We have completed inspections for 429 of the 550 items in the inspection planning scheduling database.

The remaining 121 open items, some amount of inspection has been performed and, in most cases, we are waiting on TVA to either complete some construction or testing activity or to perform some corrective action before the inspectors can complete their inspection and close out the item.

Considerable work has gone into planning the remaining inspections to ensure we have inspectors ready when different aspects of the IPNS items become available.

While a lot of inspections have been completed, there are still many significant inspection activities remaining specifically in the area of testing.

In the area of pre-operational testing, the hot functional test is currently scheduled for early next year. For this test, the reactor cooling system reaches normal operating pressure and temperature without nuclear steam generation to demonstrate plant safety and operation.

There is a significant effort where we mobilize a large inspection team that must be prepared to cover around the clock

activities over several weeks.

An example of large operational program inspection is in the area of fire protection. This inspection will evaluate a number of open IPNS items as well as looking at the acceptability of Fukushima mitigating strategies orders -- I'm sorry -- and we'll also be taking a look at the as-built condition of the plant.

The inspection of the Fukushima mitigating strategies orders is scheduled for completion in the January time frame. This will be the first performance of this inspection.

Next slide, please?

The inspectors at Watts Bar Unit 2 continue to focus on construction testing, specifically those remaining activities that need to be verified to allow completion of the IPNS items.

This year, we inspected and closed 82 items and reviewed for closure different aspects of many others.

Over the last several months, we inspected several significant milestone activities. One example was open vessel testing which confirmed the availability of the emergency core cooling system pumps to function as designed.

A recent activity was the cold hydrostatic testing of the reactor cooling system and reactor pressure vessel assembly.

This test involved pressurizing the reactor cooling system to approximately 3,120 pounds of pressure which translates into 125 percent of the design pressure. This test provided assurance of the pressure retention integrity of individual components as well as the welded and mechanical joints that join them together.

Our team of inspectors provided independent confirmation that there was not any through-wall leakage at this very high pressure.

The picture on the left shows one of our inspectors witnessing the reactor pressure vessel assembly. This evolution involved lifting and moving several key components in preparation for the reactor cooling system hydrostatic testing. We verified proper sequencing, spacing and foreign material exclusion during this evolution.

The picture on the right shows one of our inspectors verifying proper installation of the full flow filters that were installed within the reactor vessel lower internals and core barrel.

The filters replicate fuel bundles that are necessary to ensure hot functional testing properly models plant conditions.

Next slide, please?

The refurbishment program is unique to Watts Bar Unit 2. It consists of cleaning, rebuilding or replacing components that have been in place for an extended period of time. These activities provide assurance that the components will perform their intended functions with the same reliability that they would have if the plant had not experienced the extended construction delay.

The specific provisions of the refurbishment program was reviewed and accepted by the staff as part of the resumption of construction activities. Over the course of the project, we have inspected many of the passive systems and components such as piping and concrete to verify first hand the condition of the plant.

The picture on the left shows one of our inspectors entering the reactor cooling system through the reactor coolant pump bowl. In this example, we crawled through the piping to verify the material condition before and after it was cleaned and to look for any departures from quality and design requirements.

We also inspected corrective actions to verify that applicable requirements were met and we challenged TVA to ensure that the appropriate scope for systems, structures and components were considered throughout the project.

In regards to active components such as pumps, valves and motors, we inspected a broad range of refurbishment activities including the disassembly and reassembly of safety related pumps and the replacement of safety related motor operated valve actuators.

The picture on the right shows one of our inspectors performing a receipt/storage inspection of a new vital inverter for Unit 2.

Next slide, please?

As I mentioned earlier, Watts Bar Unit 2 will be the first plant at which we will begin to inspect the implementation of Fukushima mitigating strategies orders. It will also be the first plant where we start to inspect the full implementation of the cybersecurity plan as required by 10 CFR Part 73.54.

When we preform the inspection for the Fukushima mitigating strategies, it will not be the first time we have looked at some of the new facilities. The photos on this slide show our inspectors monitoring the construction of the basement of the half a million gallon

auxiliary feed water storage tank and some of the piping between the tank and the Turbine Building.

We monitored the construction of the seismic storage facility that will house on-site mobile mitigation equipment and additional diesel generators.

We also monitored and observed the work to install mechanical and electrical connections for use in connecting mitigating strategy equipment to plant systems. We did not identify any issues of significance during these construction activities.

Next slide, please?

Since 2008, I've had the opportunity to manage the on site inspection program and personally witnessed the program progress at the site. Overall construction activities have met regulatory requirements and we have reasonable assurance that the plant is being built in accordance with the design.

We have verified this through inspection of in-process work, inspection of as-built systems and inspections of pre-operational tests. These inspections are reflected in our detailed inspection reports.

We have been very thorough and comprehensive in our inspection activities as demonstrated by the large number of resources expended as Vic mentioned earlier.

Where we have had inspection findings such as in the area of commercial-grade dedication and the seismic qualification of circuit breaker configurations, TVA has resolved those issues and we have thoroughly reviewed corrective actions to confirm that TVA has

achieved compliance. Currently, there are no potentially significant open issues or findings.

I'm confident that our inspectors have added value as evidenced by corrective actions and improvements made at the site. Our resident inspectors are out in the plant daily, during weekends and on back shift to ensure that we are providing the right level of regulatory oversight consistent with our inspection program.

Moving forward, I anticipate that the project will become more dynamic as construction completion nears. Testing continues, systems turn over and transitions to operations occur. Therefore, we will continue to be agile and flexible to respond to this changing and dynamic environment over the next several months.

This completes my presentation. At this point, I'll turn it back to Mark for closing remarks.

MR. SATORIUS: Just very quickly and we'll go to the last slide.

I'm confident that the agency has performed the necessary actions required to perform its regulatory function given the unique history of Watts Bar Unit 2.

We thank you for your time and looking forward to your questions Chairman and Commissioners.

COMMISSIONER MACFARLANE: Great, thanks.

All right, over to Commissioner Baran.

COMMISSIONER BARAN: Thanks, Chairman.

Vic, there's been quite a bit of discussion of the history of Watts Bar and NRC's inspection program. Can you talk a little bit

about the results of the inspections and reviews that NRC has performed of the refurbishment program and legacy programmatic issues? Are you confident that these issues are adequately addressed by the licensee?

MR. MCCREE: Thank you, Commissioner, for your question.

And I'll ask Tomy to help me with any details, but just as an overall assessment, we have, again, implemented the inspection procedure for inspection refurbishment programs, inspection procedure 32-700, and we've made publically available the results of those inspections as well as all the inspections we've done.

And we've not identified any major issues associated with TVA's implementation of their refurbishment program which will be a factor in our overall assessment of their substantial completeness and readiness to start up readiness for issuance of an operating license.

MR. NAZARIO: I would agree with Vic. I was formally involved with license renewal and as TVA mentioned in one of their slides, some of the considerations in coming up with a refurbishment program were aging lessons learned and also, you know, specifically in the areas of passive components.

So, in those areas, we looked at those very closely. It's something that I've been personally involved with since 2008 in the beginning of the project and we haven't identified any significant or issues that are currently open at least on our end.

COMMISSIONER BARAN: Well, Tomy, you're the Senior Resident Inspector there are we're all relying on you and your

fellow resident and regional inspectors to oversee the construction work being done there and we appreciate having you here to get the benefit of your first hand insights and perspectives.

This is maybe just a slightly different way of asking a question I just asked, but based on your inspections, are there any issues that you feel, looking at the next few months, could represent significant licensee challenges proceeding loading of the core?

MR. NAZARIO: There are challenges and one of them are maintaining ourselves flexible, given just the dynamic environment. Some of us were previously involved with the restart of Browns Ferry Unit 1 and in that same light, I would anticipate on experiencing some of those challenges.

The other challenge would be in the area of discovery as TVA discussed during their presentation. Once they become -- once they start testing a lot of these systems and continue testing which they have over the last year, they may run into component issues and then those will have to be addressed on a case by case basis.

So, again, we have to remain from an inspector standpoint, we have to remain agile, flexible, ready to respond, ready to thoroughly look into the issues and the corrective actions that TVA takes.

So, that's a challenge, however, I believe we're in a place where we're ready and capable of managing and anticipating those as they come.

COMMISSIONER BARAN: Thanks.

On the first panel, TVA mentioned -- there was a little

bit of discussion about implementation of the cybersecurity regulations. I understand that there are constraints on how much detail we can get into on that in a public meeting, but could you give us -- and I'm not sure who best to answer this question -- but can you give us a general update on the review of the eight milestones for cybersecurity implementation at Unit 2? I want to understand if cybersecurity implementation is likely to present a challenge to the issuance of an operating license.

MR. DEAN: Yes, so, thank you, Commissioner.

So, a lot of the inspection activities related to cybersecurity are a conjoined effort between regional staff and then our Office of Nuclear Security Incident Response. And I know Brian McDermott, I think is up in the back. So, I don't know, Brian, do you want to take a shot at that or Barry Westreich? Hey Barry.

MR. WESTREICH: Hi, I'm Barry Westreich, Director of Cybersecurity Directorate.

Currently, they're scheduled to be in full compliance by start up with two exceptions related to EP and security systems. So, I think the current status is they are working through their -- they don't have any milestones, they're just in full implementation except for those two areas that are related to Unit 1.

So they're working through their schedules. We're really waiting to see when they have their implementation schedules ready so we can go do inspections.

COMMISSIONER BARAN: And so it sounds like you don't have significant concerns at this stage where things are?

MR. WESTREICH: Well, no, we've been out to the site and we've looked over all of their progress, but I think we need to do more to really understand where they're going to be.

So, they've committed to us to have all those activities completed and then we're scheduling inspection activities, I think, December, February, every couple months to go out and verify that they're where they think they're going to be.

So, we'll be looking pretty closely to make sure that they're where they think they're going to be.

COMMISSIONER BARAN: Okay, thank you.

On the first panel, Mr. Safer raised concerns about decommissioning funding. What's the staff's assessment of TVA's ability to meet the decommissioning funding requirements for Watts Bar 2?

MR. DEAN: I'll take a first crack at that, Commissioner, and then we have one of our financial senior analysts in the audience, Mike Dusaniwskyj, who can probably provide a little bit more detail.

But TVA has, with respect to Watts Bar, is in compliance with the regulations. Obviously, in consideration of Watts Bar Unit 2, in terms of what they would have in a decommissioning fund at this point in time would probably be relatively minimal because you're looking at the whole life of the plant to accumulate that.

But our process does require biannual reviews of decommissioning funding plans for all utilities, all licensees and then as a plant get closer into a time frame where they would be beginning to

pursue decommissioning, we take a much more scrutinized look at their decommissioning funding.

And I don't know if Mike --

MR. DUSANIWSKYJ: You hit it.

MR. DEAN: He says I hit a home run. Thanks, Michael.

MR. DUSANIWSKYJ: I taught you well.

CHAIRMAN MACFARLANE: We're being clobbered by baseball.

COMMISSIONER BARAN: I think this would be a question for Michele. What do you think the biggest challenge is facing the NRC licensing staff in the coming months are going to be for Unit 2?

MS. EVANS: So, currently, and as Justin had mentioned, the most focus right now is in the areas of hydrology, some electrical issues that we're trying to resolve, fire protection.

So those challenges, I think they are where we need to focus our resources and we've done that. We're attempting to -- well, we've got like weekly meetings that we have that are standing public meetings to have technical dialogue on the issues in front of us.

We've also arranged to go to the site, have audits on site as needed and, for example, next week, we've got two teams of people headed to Chattanooga and Knoxville looking at hydrology and electrical.

So, I mean I wouldn't necessarily, you know, they're challenges that we're on top of and feel that we can address.

COMMISSIONER BARAN: Great. And I have a couple of minutes left which I don't need to use, but I want to give you all just an opportunity to comment on anything that you heard from the first panel. Is there anything we should know about the comments made by either TVA or Mr. Safer, thoughts you have about those?

MR. DEAN: I would offer, Commissioner, that one of the ones I was going to respond to if you didn't ask the question was on the decommissioning funding issue, that was certainly one.

Perhaps another one might be there were certainly some issues raised by Mr. Safer. And I do have to say I wish he was an NRC inspector with a name like that.

But, he raised certainly some technical issues associated with ice condensers and we do have a member or our branch chief of our containment branch, Bob Denning, is in the audience and he might be able to address, perhaps more specifically.

But, one thing I do want to mention to the Commission is that, you know, in the aftermath of Fukushima, obviously, there was a lot of focus on the Mark I and Mark II containments. And, obviously, we've put in place orders associated with venting and to try and reconcile what were perceived to be vulnerabilities with that design.

But in our dialogue, the steering committee and then the staff, certainly the issue of ice condensers certainly has been raised relative to is that a condenser, I mean a containment design that we ought to look, too? And that's going to be captured in one of our tier three post-Fukushima activities.

So, I mean certainly there is a recognition within the

agency and within the industry that the ice condenser containment is different and probably needs to be addressed. I don't know, Mark?

MR. SATORIUS: I just was going to give a historical perspective. D.C. Cook is also what we call an ice plant and they went through a significant time that they were offline like many years because of ice issues that kind of went out into the industry and we've looked at those. It doesn't mean we've solved everything, but they do add -- these ice plants do add a level of complexity that the larger containments don't necessarily have.

So, I think that that's something I know that when I was in Region III that that was a focus area that we always had was this ice plant. Most of the ice plants, they --

MR. MCCREE: In fact, as a result of those issues and lessons learned, we actually developed a specific inspection procedure for inspecting ice condensers and it's in Appendix Charlie of the Inspection Management Chapter 2515, so that helps guide how we look -- what we look at and when we look at issues associated with the ice condenser.

With regard to the question you asked Tomy about issues, and while there are not any specific technical issues that are of concern, the volume of work which we've alluded to and TVA alluded to, is significant that's necessary to be completed between now and then, and certainly the amount of pre-operational testing is significant.

So, we're wary of, I mean the Unit 1 is operating and there are a number of common and shared systems. So, TVA needs to take care and certainly we're aware of opportunities where you could

have interface with operating systems and it could represent an industrial safety hazard, it could represent a hazard for the other unit.

So, it's something we've engaged TVA on, they're aware of it, have been since the beginning of the project but it's an ongoing concern, one that is even more important as the unit gets closer to a licensing decision.

MR. DEAN: So, I don't know if you need anymore, I have Bob Denning who's the principle on the containment ice condensers?

COMMISSIONER BARAN: I should stop there and give my colleagues an opportunity.

CHAIRMAN MACFARLANE: Don't go anywhere. Okay, so let's just continue the discussion just a little bit.

How many ice condenser plants are there in the U.S.?

MR. MCCREE: There are five sites.

CHAIRMAN MACFARLANE: Five sites with how many reactors?

MR. MCCREE: A total of two, four, with Unit 2 it'll be six, seven units.

CHAIRMAN MACFARLANE: Eight?

MR. DENNING: Eight.

CHAIRMAN MACFARLANE: Okay.

MR. MCCREE: Oh, I forgot, Sequoyah, yes.

CHAIRMAN MACFARLANE: Right. Okay, great. Yes, so they're all dual unit plants? Okay.

Do other countries have ice condenser plants?

MR. DENNING: No.

CHAIRMAN MACFARLANE: We're the only ones?

MR. DENNING: We're the only ones that use that design.

MR. MCCREE: Watts Bar Unit 2.

CHAIRMAN MACFARLANE: So, all the operating experience is here?

MR. DENNING: I believe so.

MR. MCCREE: Watts Bar Unit 2 would make ten.

CHAIRMAN MACFARLANE: Okay, okay. Anything else you want to add on the ice condensers?

MR. DENNING: I had a chance to look over the discussion from the earlier presentation. I would just note that the one with regard to Fukushima, the ice condensers are part of a near term task force 5.2 which is tier three --

CHAIRMAN MACFARLANE: Right.

MR. DENNING: -- which is intended to look at venting specifically, as whether that's needed or not.

However, the agency's containment performance improvement program that looked at the risk assessment of all the containment types and finished up in the early '90s did not flag venting for the ice condensers as a need but the hydrogen control was the need and that's why they had the igniters and that's why their in the tech specs and there are two trains of them.

CHAIRMAN MACFARLANE: And that's another issue that will be looked at as part of tier three, right?

MR. DENNING: Right, that's in TTS 6.

CHAIRMAN MACFARLANE: Okay. Great, thanks.

So, let me, instead of going into my more detailed questions, let me just ask a more philosophical and so I'm thinking into the future, all right, of making an assumption of about Watts Bar 2 going forward and it's the same situation to some degree with Watts Bar 1.

These plants were originally licensed a long time ago and constructed largely a long time ago. But they didn't start operating until much more recently.

So, what does that do in terms of license renewal? Where does the clock start? Have you thought about that?

MR. DEAN: Well, I'm thinking about it now. But, no, I actually have thought about that. We have talked about that and certainly we have a regulatory regime that exists through inspection, oversight, licensing activities and so on that is intended to sustain the viability of a plant through its originally licensed 40 year life and then we also have a license renewal rule that provides here's what needs to be done relative to a facility if a facility wants to pursue life beyond its original licensed time frame. So, I think we have a pretty robust infrastructure.

CHAIRMAN MACFARLANE: We do, but, you know, where is time zero? Because do we have other examples like this to draw from? You know, I'm always looking for precedent or I don't like reinventing the wheel.

MR. SATORIUS: So, you're talking about if there were other extended construction periods --

CHAIRMAN MACFARLANE: Yes.

MR. SATORIUS: -- that went beyond.

CHAIRMAN MACFARLANE: This is a -- it seems, maybe it's a unique situation, I don't know.

MR. SATORIUS: I think the answer is in the room. I'm not for sure. I think it's from the time that the plant was licensed.

MS. DOANE: The plant, when it's licensed to operate which it's not been -- that's the construction.

CHAIRMAN MACFARLANE: That's legally.

MS. DOANE: Yes.

CHAIRMAN MACFARLANE: Yes, but I'm asking technically.

MS. DOANE: Technically, I'll leave it to them. How's that?

MR. DEAN: We have the current Deputy Office Director at NRR who was the previous Director for the Division of License Renewal, Brian Holian.

MR. HOLIAN: Brian Holian.

Four years in license renewal and it is a good question. We look at, I know, the Commission's looking at life beyond 60 which is, you know, a separate item.

The overriding arch principle is that you'll be able to pick up the aging issues from operating experience and go from there.

So, part of the look that license renewal did early on when Vic McCree was setting up his inspection plan was to use the generic aging lessons learned program that we've instituted in the

license renewal.

So, we're looking at the passive systems for current plants and the data and the operating experience that we get from plants right now that are in the extended period is an item that we can still apply to Watts Bar as they get there.

So, it's a fair question to look at that obviously they'll have much longer time in their passive systems that have been sitting there, but through the inspection and through the operating experience, we believe that we will be able to account for that through additional license conditions, should that be necessary, additional inspections in the process as it comes.

I just respond that it is a living project that is based on operating experience and it's flexible enough to be able to look at the -- assuming they come in for license renewal, look at the types of aging management programs we would need to put.

I remind folks at license renewal, the backfit considerations, it looks at the licensing process there and they're able to apply new license conditions based on an aging management review, if that helps.

CHAIRMAN MACFARLANE: Okay.

MR. HOLIAN: But, it's a great question and it is one and you asked for precedence, really right now, the precedence is the plants that are in the extended period now, we'll be able to apply those lessons learned when Watts Bar comes along.

CHAIRMAN MACFARLANE: Okay, thanks. Thanks, Brian.

Okay, so, in terms of the remaining licensing actions that are needed, especially with regards to the Fukushima lessons learned, are they on track or is the current time line realistic do you think?

MS. EVANS: Yes, I'd say the current time line to continue through the review that the headquarters staff is working through for those issues and then, you know, for hydrology, for fire protection, those are on track.

CHAIRMAN MACFARLANE: When's the hydrology review going to be done, do we know?

MS. EVANS: We are currently targeting completing it by the end of this calendar year.

CHAIRMAN MACFARLANE: Okay.

MS. EVANS: We will need to talk about the hydrology review with ACRS which currently is scheduled into the January/February time frame. So, that's the plan on that.

The Fukushima items, the orders, we do have right now, we need to implement some inspections to do the review. We're waiting for the licensee to indicate their completion and I think right now, our early 2015 would be the time frame for doing the inspections and the on site work to complete that part.

CHAIRMAN MACFARLANE: So we have a lot -- you said we have a lot of work to do. Do we have the resources to do it? Are we set that way?

MR. MCCREE: Yes, ma'am, we do. When we received TVA's indication that they wanted to complete Watts Bar Unit

2, we partnered with NRR and with the Office of New Reactors which had been established at that time and decided that the funding, if you would, for oversight for Watts Bar 2 would be under the new construction business line, the new reactor business line. So, we have that capacity, if you would, to pull from for new reactors.

And, that's, of course, mainly in Region II, but we also have budgeted resources in the other regions as well as headquarters that we can pull from. And in fact, we've already reached out to the other regions, the technical training center for operator licensing, there's trained folks there that we'll be able to call upon if we need to in the spring and Bob is -- we've given -- Fred and I have given Bob very close marching orders to build those relationships and actually identify the people who would be able and willing to support our efforts in the spring, if need be, to complete our inspections at Watts Bar.

CHAIRMAN MACFARLANE: Great, okay, good.

Tomy and maybe Justin wants to weigh in on this, too.

So, there were 550 items that required inspection or closure, 429 are complete. Are we on track to do the rest? Are there any challenges that you see?

MR. NAZARIO: The numbers don't tell the full story, obviously, so we have 121 items. The short answer is we are on track to complete and inspect the remainder of the items. We've touched every single item as far as some level of review or inspection.

So, as far as how it looks between now and let's say next year, I believe we have the capability and the resources to move forward with the inspection of the remaining items.

CHAIRMAN MACFARLANE: Okay, did you want to weigh in, Justin?

MR. POOLE: Not really. I mean I think as far as licensing goes, Michele already covered. We've, you know, we've identified which items are, you know, are the most resource intensive for us at this point and we've got a plan to finish all those in the time frame that would support the overall schedule.

CHAIRMAN MACFARLANE: Okay.

MR. SATORIUS: Chairman, it's probably good to recognize the fact that being able to finish the inspection presumes the TVA will be ready to support them.

CHAIRMAN MACFARLANE: Of course, of course, right. Thanks for that clarification.

All right, I'm going to turn things over to Commissioner Svinicki.

COMMISSIONER SVINICKI: Well, I want to thank the staff and I want to welcome Mr. Dean to his first Commission meeting. It's good to see you here. It's nice to have your first meeting be where you can just kind of sit and coast on the hard work of everyone who is in NRR and your predecessor and others.

MR. MCCREE: Commissioner, I actually gave a football analogy, his predecessor moved it into the red zone and he's just coming in as the --

MR. DEAN: Yes, we're in the red zone but --

COMMISSIONER SVINICKI: I will say for an organization of your size, you've demonstrated at least impressive

knowledge of who to call on from the audience, who should come up to the microphone and answer the questions for you, so that's a solid start.

I mentioned to the previous panel that I've been following this work as it moved along and so, there wasn't too much terribly new to me. The staff, for those who don't know, provides an impressive array of written materials that we can review in advance of the meeting.

But, that isn't to say that I wasn't struck by something looking overall at, you know, that the evolution of the process here and in a day and age when there's a lot of criticism, I'm sure some of it's valid. NRC has always is always the first to acknowledge that, you know, we can do certain things better.

But, there is this criticism that, you know, regulatory agencies have a mindless adherence to whatever's written in the CFR and we don't have any ability to have a tailored application of what it is that we're requiring.

And so, I was stuck by the tremendous knowledge and innovation, to a certain extent, maybe that's too dramatic of a word, that NRC experts brought to saying, you know, here is the safety question we are presented with.

In taking this decades of knowledge of a regulatory framework that is highly regarded around the world, what is the efficient and effective way of applying that? And I found that in everything from, you know, the Inspection Manual Chapters, things that I flipped through in the binder that, as a Commissioner, really don't come to my level, but it's interesting to flip through and see the kind of expertise that's

reflected in when NRC experts sit down and decide to apply our regulatory framework and their knowledge to the question at hand.

And so, I thought it was impressive, you know, as a body of people saying, let's look at what needs to be done and I'm confident, at this point in my tenure at NRC, that there is no body of experts around the world that sets a higher standard of skepticism and show me than the NRC staff.

There may be other regulatory agencies that have maybe an equivalent level of competency, I'm not sure of that, but I know for sure that there's nobody that sets a higher bar for saying, you know, this will be this safe and you will prove it to me that it is.

So, Victor, when you talked about an entire reconstitution of the inspection records, things like that and having looked at some of the staff's instructions and manual chapters and things that guided them in doing that. It's very difficult for me to leave without being convinced that this was very thorough on our part.

So, I want to just begin with that observation that I make about it and some compliments and it's not, obviously, just you sitting at the table. Maybe some of you had very minimal in all the things that I just credited. But it is, I think, very impressive.

And I don't know that having demonstrated this impressive thing there's any future use for it, maybe Tomy, it was so interesting last chat we had when he talked about license renewal that's come up today, aging lessons learned. That is, so maybe there will be opportunities for us to take these experiences and fold them back into other part of our regulatory framework.

Mark, I don't know if you wanted to make any reaction to that?

MR. SATORIUS: Well, my first reaction is, thank you very much for the compliment. I'm also very complimentary of the staff, especially in the effort that's gone through the licensing of this facility. I think we've taken pragmatic approaches to produce solid results and we have really, really good people that are able to think clearly and put this all together and make it work in the manner that you've seen it. So, thank you for your compliment.

MR. MCCREE: And the only thing I'd add to that, I think many times we don't recognize our inherent innovation and creativity that exists all over the agency and the Watts Bar effort, both from a licensing as well as from an inspection program development perspective is evidence of that.

I look forward to seeing it evidenced in the results of our federal employee viewpoint survey in the area of innovation and creativity because this certainly highlights that it happens routinely.

COMMISSIONER SVINICKI: Well, and I appreciate that. You know, I hesitated to use that word and you're giving me some validation in using it because a lot of people would feel like maybe that doesn't have a place in our work. But maybe this is what innovation looks like for regulators is doing that efficient and effective application of a framework.

And the most interesting thing, again, any day I engage with the NRC staff, I always have some thought provoking things that come up. And Tomy had mentioned to me, too, when I -- last time I

visited and sat with him and the rest of the inspectors at Watts Bar 2, I was drawing these contrasts and kind of apologizing a little bit that, you know, recently I've maybe spent more time at Vogtle and Summer construction.

And so I was saying I realize that's fundamentally different and it was a great point that I've thought about every since that Tomy challenged me and he said, but at bottom, it really isn't different. And what he's getting to is this show me, this demonstration, it's the showing that needs to be made.

And it isn't as if in the adoption and implementation of 52 there was any see change or fundamental overhaul of what it meant to convince the NRC that something was appropriate to operate or move forward. So, I appreciate that.

Tomy, do you want to add a little bit about what we talked about? Even when I was drawing a contrast with the inspection program and with ITAAC and the documentation, you were laying out for me that, at the end of the day, what's been done here is not some inferior cousin to Part 52 and I don't know if you'd like to talk a little bit more about the point you made with me.

MR. NAZARIO: The only thing I would add is, again, fundamentally, as far as the inspection program's concerned, you know, what we do for Watts Bar Unit 2 and the Inspection Manual chapter that drives us and Part 52, it is fundamentally the same.

I mean we have inspection procedures that drive us to go out and take a look at a lot of different aspects of the plant. We validate acceptance criteria, for example, when they're performing

testing, significant testing.

So, when we -- and we validate that because we interact frequently with a lot of the regional inspectors that work and go out to both Summer and Vogtle. We also have periodic conference calls with some of the senior residents, Justin and formerly Rasheen who was out at Summer and Vogtle.

You know, and we share that operating experience or construction experience in this case to confirm that what we're doing is pretty much the same as you alluded to.

MR. MCCREE: The only other thing I'd add to that is when it comes to pre-operational testing procedures and start up testing procedures, we're essentially going to be using some of the same approaches, the same procedures for both Watts Bar and at the AP1000. So, we're going to learn from that experience and the synergy that we're gaining from having some of the same people conducting inspections at AP1000 and Watts Bar is going to be very, very, very helpful, same qualifications and same trained people, so that's good news.

COMMISSIONER SVINICKI: So, that was the nice part.

The one thing that struck me in looking at this, because you do always key into the parts of the process that would involve you personally.

So, we have the time frame in there on, you know, how Region II will make a recommendation to the director of NRR and all of these steps and that all makes a lot of sense to me. I even went back

and studied my 50.57 issuance of the operating license, again, written as almost all of our regulations are written at a very high level.

The Commission, you know, must pursuant, we must make findings that, you know, the construction of the facility is in accordance with, the facility will operate in conformity with, you know, I'm not -- I won't read all -- there's reasonable assurance that activities authorized can be conducted, you know, supportive of the public health and safety, things like that.

So, when I see that we've had this multi-year tremendous process where all of NRC's experts have all of this time to satisfy themselves that all of those findings can be supported. And then I see that the Commission will perhaps have its time frame be as little as 30 days where we would be asked to approve a recommendation that the director of NRR issue the operating license.

Now, I've pulled the thread on this and I understand that the ACRS meetings got pushed back to January/February and I know that the staff has to consider what is the proper time? What activities are fulfilled at the time that you come to the Commission?

But, I will say that, you know, this isn't so different than something the Commission dealt with earlier this summer which was there are certain activities where we've reserved to ourselves that if something's going to occur, although the director of NRR has many standing delegated authorities, there are instances where we've said in this for this specific action, we do request that you come back again. We don't issue the license, but we want to be asked specifically, you will ask if you can issue the license and we will delegate it for that narrow

application.

But, we looked at things, like we've been looking at a lot of EP requirements at decommissioning reactors, and all those papers ever say to the Commission, the Notation Vote Papers, is the staff will verify that the following showings, in a legal sense, or demonstrations are made, we will do the confirmation for you, Commission, and upon that showing, does the Commission agree that the director of NRR can do X?

So, we don't actually do any of the validation of the showing. We agree -- when I vote on something like that, my view is what I'm saying is, yes, that's the requisite showing. I agree that that is completely sufficient and complete in terms of supporting the findings that need to be made.

So, with findings this high level and expansive, it does seem a rather compressed time frame for the Commission to act on the notation vote paper. And all I ask is that you consider when you're trying to find that sweet spot to engage the Commission that you look at having enough of the activities completed on the showing. But you're never going to have all of them done because that's not the nature. You don't wait until they're ready to go to power ascension, you back this system up.

So, it just seems that the Commission is being squeezed. I won't suggest that we lost all -- the ACRS took two more months and we lost our months, but I can't, you know, say anything one way or another other than to say, in a multi-year process for the Commission to have 30 days, you know, seems short. So just take

that back with you and do with it what you will.

CHAIRMAN MACFARLANE: Okay.

COMMISSIONER SVINICKI: Thanks.

CHAIRMAN MACFARLANE: All right. Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you, Chairman. I'd be remiss if I didn't also welcome Bill Dean. I'm going to throw mine out a little differently.

I encourage those, and especially NRC staff, not today, but to ask Bill Dean the one liner he heard from Admiral Rickover in his nuclear propulsion interview. It's the best I've heard from any NRC staffer, it's on my top five list of all the Rickover interview stories. I'm not going to share with you what it is.

I appreciate that Michele and Justin laid out the Part 50 process and the history here and I think that was very helpful for us to understand where things were.

And I want to start out with maybe a question to Justin on the kind of replacement refurbishment piece and maybe Tomy has a piece here.

But, I noted that I had a question in the first panel of Mike Skaggs on what kind of standards were used to determine what should be refurbished or replaced and there was reference made to EPRI standards and Generic Aging Lessons Learned and so forth.

And I noted that Tomy made a comment that in his slides that the specific provisions of the refurbishment program by the licensee were reviewed and accepted by the staff.

At a high level, were there any deltas between you and your project team and the licensee on agreement or disagreement on what should be replaced or refurbished?

MR. POOLE: Yes, I think for the most part I'm going to defer to Tomy for most of this answer. But, you know, TVA presented the headquarters staff with a plan. You know, there was some back and forth in what the plan was, but then the staff eventually approved that plan and I think your question more is for Tomy.

Have they found anything where they may have questioned TVA and why didn't you actually go and implement this plan for this specific component?

COMMISSIONER OSTENDORFF: Yes, and again, recognizing this is somewhat, as others have noted, a very unique project in its history of it. I'm curious as to if there's any big deltas between the NRC as a safety regulator and the licensee on what did or did not need to be replaced?

MR. NAZARIO: I think it's important to highlight the fact that the refurbishment program was submitted to the NRC, as Justin mentioned. We reviewed it, the NRR staff reviewed it and we actually, from the region also had the opportunity to review it.

And then as a product of that, we developed a specific inspection procedure, refurbishment inspection procedure to basically carry out and perform our inspections.

So, there was some level of alignment early on as part of the process and, for example, you know, some of the inspections that we performed, TVA would go out and open up systems, going through

piping, document visual evidence of what the piping looked at before and after. And we would, as best we could, and again, on a sampling basis, we would follow suit.

So, from that standpoint, I don't see any deltas as far as what was submitted and what we did regarding the refurbishment piece.

COMMISSIONER OSTENDORFF: Okay. Did you want to say anything? Okay, okay, thank you. Thanks, Justin, Tomy.

I want to take this opportunity, I think it's important for us to highlight it, that the, you know, to talk about the pride we have in the construction and inspection program, whether it be under Part 52 or Part 50, and I appreciate, Victor, that you brought up some of your key people here.

And I kind of chuckled when you used the phrase regulatory tissue in your comments and I wanted to tell Bob and James and Chris and Fred and Tomy, I think that was a compliment. I took it that way.

But I know that we're all very proud of what you all have accomplished between working with NRO, with the folks in Atlanta, Region II, and the sites and I think this is a real strength for this agency.

I was overseas last week and not surprisingly, as other Commissioners hear from international colleagues, there were requests being made by another country I'm not going to name to have some of their people from the regulatory body come over and see how you're doing business. And so, there's no greater compliment that somebody trying to imitate what you're doing and so I just pass that on

in this forum because I think it's just such a strength and we've all at the Commission level been very impressed with what you're doing and very grateful for that.

Tomy, let me go back to you with a question. You've been there for some time, I think all three visits I've made to Watts Bar you've been there and we've crawled around together.

Can you, at a high level, can you comment on the ability of the licensee, TVA, to identify problems? I know that there is an inspection role, an oversight role, so you're going to naturally find challenges and problems. Can you comment how you see the licensee and their ability to self-identify problems with construction?

MR. NAZARIO: As far as the identification of problems, one thing that's important to note is during the original construction of Watts Bar Unit 1 and the site, they really did not -- there was not the existence of a corrective action program and that's actually what contributed to a lot of the equality issues that Vic spoke about and TVA spoke about and Mr. Safer spoke about.

So, from that standpoint, one of the things that was done early on in the project was essentially assimilated the corrective action program that was already in existence for Unit 1 which, to date, has proved to be effective and we haven't found any significant issues with.

So, essentially, what TVA did was just that, they took the existing corrective action program, implemented that. We've actually had the opportunity to review, inspect that program closely. We continue to monitor that program.

We sit in on what they call their management review committee meetings which occur once a week. And we also sit in on their daily meetings where they review problem evaluation reports.

And then when, I guess as the last barrier, we actually go through in detail and review every corrective action, or I'm sorry, every problem evaluation report that gets issued for Unit 2 and then our counterparts on the Unit 1 do the same.

So, from that standpoint, again, we haven't identified any issues of significance. We believe they're complying with Appendix B and criterion 16 which discusses corrective action program and the licensee's ability, the applicant's ability of having one.

So, as far as my overall take since 2008, it has evolved and I think there have been some improvements made in the corrective action program. But again, no issues, at least from my standpoint.

COMMISSIONER OSTENDORFF: Thank you all. Thank you, Chairman.

CHAIRMAN MACFARLANE: Okay. Any further questions? No? All right, well then we will call this to a halt.

Thank, again, the staff panel with our new director of Nuclear Reactor Regulation. I thank the external panel for their contributions as well and we will be adjourned.

(Whereupon, the above-entitled matter went off the record at 11:50 a.m.