Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Thursday, February 7, 2013

Work Order No.: NRC-3094 Pages 1-195

NEAL R. GROSS AND CO., INC.
Court Reporters and Transcribers
1323 Rhode Island Avenue, N.W.
Washington, D.C. 20005
(202) 234-4433

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

+ + + + +

601ST MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

THURSDAY

FEBRUARY 7, 2013

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Advisory Committee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B1, 11545 Rockville Pike, at 8:30 a.m., J. Sam Armijo, Chairman, presiding.

COMMITTEE MEMBERS:

J. SAM ARMIJO, Chairman

JOHN W. STETKAR, Vice Chairman

HAROLD B. RAY, Member-at-Large

SANJOY BANERJEE, Member

DENNIS C. BLEY, Member

CHARLES H. BROWN, JR. Member

MICHAEL L. CORRADINI, Member

DANA A. POWERS, Member

JOY REMPE, Member

MICHAEL T. RYAN, Member

STEPHEN P. SCHULTZ, Member

WILLIAM J. SHACK, Member

GORDON R. SKILLMAN, Member

NRC STAFF PRESENT:

PETER WEN, Designated Federal Official

DAVID AYRES

JIM BEARDSLEY

TIMOTHY FRYE

THOMAS KOZAK

KERRI KAVANAUGH

JOHN LUBINSKI

JAMES LUEHMAN

RICHARD McINTYRE

PATRICK MILANO

RICK RASMUSSEN

ED ROACH

ABDUL SHE

ALSO PRESENT:

MARK DiRADO

DAN DORAN

MICHAEL GALLAGHER

GENE KELLY

MARK MARQUIS

MARK MILLER

GREG SPRISSLER

TOM DOUGHERTY

CHRIS MUDRICK

T-A-B-L-E O-F C-O-N-T-E-N-T-S

P R O C E E D I N G S

(8:30 a.m.)

CHAIR ARMIJO: Good morning. The meeting will now come to order. This is the first day of the 601st meeting of the Advisory Committee on Reactor Safeguards. During today's meeting the Committee will consider the following.

First, the final Safety Evaluation Report associated with the License Renewal Application for the Limerick Generating Station, Units 1 and 2. Second, component fabrication and inspection of a large nuclear steam supply system. Three, revised Construction Reactor Oversight Process assessment program.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Peter Wen is the designated federal official for the initial portion of the meeting.

We have received no written comments or requests to make oral statements from members of the public regarding today's sessions. There will be a phone bridgeline. To preclude interruption of the meeting, the phone will be placed in a listen-in mode during the presentation and Committee discussion.

A transcript of portions of the meeting is being kept, and it is requested that speakers use one of the microphones, identify themselves and speak with sufficient clarity and volume so that they can be readily heard.

As an item of interest, we are sad to learn of the passing of former ACRS member, Dr. David Okrent. Dr. Okrent, Professor Emeritus of Engineering and Applied Science at UCLA, and a well renowned nuclear physicist and pioneer in the field of nuclear reactor safety, died at his home in Los Angeles on December 14th, 2012, at the age of 90.

He received his B.S. in Mechanical Engineering from Stevens Institute of Technology in 1943, and a PhD degree in physics in 1950 from Harvard University. In 1963, Dr. Okrent was selected to serve on the ACRS, which advised the Atomic Energy Commission, which is now of course the Nuclear Regulatory Commission.

On issues related to nuclear safety, Dr. Okrent served on the ACRS for 24 years, or six terms, and as its chairman in 1966. During his time as chairman and while on the Committee he was well known for his unwavering commitment to reactor safety.

Under his leadership, the ACRS endorsed a

development of an NRC quantitative safety goal policy and developed the first set of quantitative safety goals for nuclear power plants, and that's in the NUREG-0739, An Approach To Quantitative Safety Goal. These safety goals were the basis for the later NRC work on the development of an NRC safety goal policy.

With that I'd like to turn the meeting over to Dr. Bill Shack who will lead us through the Limerick License Renewal briefing. Bill?

MEMBER SHACK: Our License Renewal Subcommittee met on September 5th, 2002, to discuss the Limerick License Renewal. There were two open items at that time. One was a license commitment to fully consider operating experience between issuance of the renewed license and implementation of program enhancements.

The other was regarding the Aging Management Program for the portion of the containment liner and the downcomers exposed to water in the suppression pool. The liner is carbon steel which has an inorganic zinc coating for corrosion protection.

Limerick has experienced coating loss and degradation and some corrosion of the liner. The staff and applicant have now reached agreement on an acceptable Aging Management Program based on

enhancements to the ASME Section XI IWE program.

And we'll open off with John Lubinski, the director of the Division of License Renewal in NRR.

MR. LUBINSKI: Thank you, Dr. Shack. On behalf of the staff we are pleased to be here today, interact with ACRS and to discuss the License Renewal Application for the Limerick Generating Station.

We have representatives from the NRR staff here to support our presentation. Those who will be seated at the table during presentations today will be Patrick Milano, the Licensing Renewal project manager for Limerick; Matthew Homiak, mechanical engineer in our Aging Management Reactor Systems Branch; Allen Hiser, senior technical advisor for License Renewal and Aging Management; and Abdul Sheik, the senior structural engineer in the Aging Management of Structures, Electrical and Systems Branch.

We also have other NRC staff present for the discussions including several branch chiefs from the Division of License Renewal. We have Dennis Morey, Safety Projects Branch chief; Michael Marshall, Structural, Electrical and Systems Branch chief; Bo Pham, Aging Management of Reactor Systems Branch chief; and Shahram Ghasemian, acting Aging Management of Plant Systems Branch chief.

I would like to note a few things about the Limerick application. First, the Limerick application is the first application we have reviewed where the applicant reviewed its programs against GALL Rev 2. We do believe that GALL Rev 2 was successful in introducing efficiencies in the review, and I believe the Limerick application supports that conclusion.

Second, at the subcommittee meeting last September we pointed out that two open items remain for review by the NRC staff. As you will hear today, the applicant adequately addressed these items and NRC revised the Safety Evaluation Report to now show the closure of these two items.

Finally, while the ACRS does not review the environmental aspects of the reviews, I do need to note that the waste confidence decision, which was issued by the court last year, has affected the review schedules for License Renewal. Specifically, a decision on whether to approve issuance of a renewed license will not occur until the waste confidence decision is adequately addressed.

While we have completed our safety review, we are aware that issues may arise between now and the time when the waste confidence decision is adequately

addressed. These may arise from staff review of operating experience, review of other applications, and review of the annual updates by the applicants of their License Renewal Applications. The staff will consider if and how this new information could impact pending license renewal activities, including Limerick.

In order to keep the review process moving and to not create a waterfall of ACRS meetings when we get ready to make final decisions on License Renewals, we propose to maintain our schedule with ACRS and request decision letters.

However, we will keep ACRS informed of any changes to SERs or supplements, so that the ACRS can assess whether it needs to have any follow-up discussions with the applicant or staff on these changes.

This concludes my opening remarks. I would now like to turn over the presentation to Mr. Michael Gallagher, senior vice president for License Renewal with Exelon.

MR. GALLAGHER: Thank you, Mr. Lubinski. Good morning. My name is Mike Gallagher, and again I'm the vice president of the License Renewal for Exelon. Slide 1, please.

Before we begin today's presentation I'd like to introduce the presenters. To my right is Gene Kelly. And Gene is the Exelon License Renewal manager for Limerick. Gene has 38 years of nuclear power plant experience, including 13 years at Limerick.

To Gene's right is Dan Doran. And Dan is our Limerick Engineering director. Dan has 21 years of nuclear power plant experience at Limerick. To Dan's right is Mark DiRado. Mark is our Programs Engineering manager, and Mark has 13 years of nuclear power plant experience at Limerick.

In addition to today's presenters we also have with us today Tom Dougherty. Tom is our site vice president. And we have Chris Mudrick, and he's our senior vice president of Mid-Atlantic Operations.

Slide 2. Slide 2 shows our agenda for today's presentation. We will begin with a description of the site and an overview of the Limerick operating history, followed by an overview of our License Renewal Application.

We will then continue with the discussions of our resolutions of the open items regarding operating experience and the suppression pool liner, redeveloped robust Aging Management Programs that will ensure the continued safe operation of the Limerick

Generating Station.

We appreciate this opportunity to make this presentation and look forward to any questions you may have. With that I'll now turn the presentation over to Dan Doran.

MR. DORAN: Thank you, Mike. Slide 3, please. Good morning. My name is Dan Doran and I am the engineering director at Limerick Generating Station. Limerick Units 1 and 2 are General Electric BWR-4 designs with Mark II containments that are owned and operated by Exelon.

The station is located on the east bank of the Schuykill River in Limerick Township, Montgomery County Pennsylvania, and is approximately four miles downriver of Pottstown and 35 miles upriver from Philadelphia. On this slide you will see that we have pointed out some of the key site features. Slide 4, please.

This slide provides an overview of the Limerick Station operation and several major physical improvements. Limerick was initially licensed to 3293 megawatts thermal in 1984 for Unit 1 and 1989 for Unit 2. A five percent increase in rate power on both units was performed in 1995 and 1996.

In April 2007, a 1.65 percent measurement

uncertainty recapture power uprate was implemented which increased the thermal rating on each unit to their current rating of 3515 megawatts thermal.

Exelon has also continued to make substantial improvements to both units, such as turbine rotor replacements, digital feedwater control modifications, independent spent fuel storage, main transformer replacements, and the recent addition of recirculation pump adjustable speed drive units. Limerick has operated on 24-month fuel cycles. The current 24-month capacity factor is 90.41 percent for both units.

The License Renewal Application was submitted on June 22nd, 2011, and our current licenses expire on October 26th, 2024 for Unit 1, and June 22nd, 2029 for Unit 2.

I'll now turn it over to Gene Kelly who will present to you the highlights of the License Renewal Application.

MR. KELLY: Thank you, Dan. Slide 5, please. Good afternoon. My name is Gene Kelly and I'm the License Renewal manager. My portion of the presentation covers the highlights of our License Renewal Application, including the Aging Management Programs and commitments as well as an overview of our

resolution of the two open items in the SER. Slide 6, please.

In preparing this application, Exelon used industry and NRC guidance with the goal of making our application as consistent with the GALL as possible. Our submittal was based on GALL Revision 2.

There are 45 Aging Management Programs including 34 existing programs and 11 new programs developed for the application. All but one of the programs were consistent with the GALL. The one exception to GALL was associated with the reactor head closure stud bolting program, specifically the preventive measure for measured or actual yield strength.

There are 47 license renewal commitments. These commitments are managed under an existing process consistent with NEI 99-04 and they're tracked as part of that process. Forty-five of these commitments are associated with aging management programs.

One commitment institutes an operating experience program enhancement, another commitment will reevaluate a Unit 1 recirculation nozzle safe-end flaw prior to the period of extended operation. This flaw was mitigated by a mechanical stress improvement

in 1992. Slide 7, please.

There were two open items in the SER with Open Items that are now closed in the final SER. Slide 8, please. The first item involves operating experience for aging management programs. The staff requested additional information to determine whether operating experience will be considered in the period between issuance of the renewed licenses and the implementation of the program enhancements.

Exelon revised its commitments and the UFSAR supplement to require that the enhancements to the Limerick Operating Experience Program are implemented no later than the date that the renewed operating licenses are issued. The reviews will be conducted on an ongoing basis throughout the terms of the renewed licenses. Slide 9, please.

The second item involves aging management of the suppression pool liner. The NRC staff requested additional information in five main areas. First, our prioritized approach to implementation of the coating maintenance plan.

Second, our methods for underwater examination. Third, the expected corrosion mechanism that's present in the suppression pools. Fourth, the ASME requirements for Exelon owner-defined criteria

that are used for augmented examination. And fifth, the recoat criteria that we've established for the downcomers.

To resolve the open item, Exelon updated IWE commitments to specify the prioritized approach for implementation of the Coating Maintenance Plan as well as the conduct of ultrasonic exams to validate our visual techniques used during the IWE examinations.

Additional information was provided on the underwater examination methods and the mechanism of general corrosion that's present in both suppression pools. Also, Exelon agreed to add the owner-defined criteria for recoat and augmented examination of the downcomers to the UFSAR supplement as well as in the ASME Section XI IWE program procedures.

We are confident that this Aging Management Program will be effective in maintaining the coating and minimizing liner metal loss.

At the Subcommittee meeting we provided a detailed presentation of the suppression pool open item. I'm going to now turn the presentation over to Mark DiRado who will provide the summary for the benefit of the Full Committee members.

MR. DIRADO: Thank you, Gene. Slide 10,

please. Good afternoon. My name is Mark DiRado and I'm the engineering programs manager at Limerick.

First I'll summarize some key points about the Limerick primary containment design, specifically the suppression pool. I will then address these key points on subsequent slides. Slide 11, please.

At Limerick, primary containment is a Mark II design incorporating a six-foot to eight-foot thick reinforced concrete containment and a 250-mil thick metal liner. The liner is twice as thick as needed to withstand design loads.

Excellent water chemistry in the suppression pool in combination with the normally inerted suppression pool airspace results in a low, gentle corrosion rate. The material condition of the liner has been thoroughly characterized, this part of ASME coat inspections, and the material condition is therefore well understood.

Exelon is committed to an Aging Management Program begun well in advance of the period of extended operation, which will ensure that the suppression pool liner intended function is maintained throughout the period of extended operation. Slide 12, please.

The Limerick Mark II primary containment

design is shown on the diagram on this slide. Primary containment consists of a drywell and a suppression pool. A slab separates the upper and lower sections of the containment. The suppression pool is situated below the drywell, and a continuous carbon steel liner, which is shown in the blue color, functions as a leakage barrier.

Downcomers provide a direct path for uncondensed steam from the drywell to the water in the suppression pool during a design basis event. Slide 13, please.

The Limerick suppression pool has a continuous carbon steel liner 250 mils thick coated with inorganic zinc. The liner has 100 percent thickness margin, a 125-mil large area thickness is required for structural integrity. For local areas, a thickness of 62.5 mils is required for structural integrity.

Regular exams, spot recoating, reactive large area recoats, and frequent cleaning of the suppression pool and removal of sludge will sustain the service life of the coating system. Suppression pool water quality is excellent and meets the guidelines of BWRVIP-190.

Gentle corrosion of carbon steel is the

corrosion mechanism present in the pools, and it occurs at a rate of less than 2 mils per year.

MEMBER POWERS: Can you tell me more about your primary coat, the what you call the inorganic zinc sacrificial coating, which I think is a zinc primer?

MR. KELLY: I'd like to ask Mark Miller of our project team to address that question, Dr. Powers.

MR. MILLER: My name is Mark Miller and I'm a member of the Exelon License Renewal Team. Can you repeat the specific question about the coating?

MEMBER POWERS: I want to know what it is.

MR. MILLER: What it is, there's two separate zinc coating. One is the Carbozinc 11 and the other is the Dimetcote 6.

MEMBER POWERS: Same below the water level and above the water level?

MR. MILLER: In the suppression pool, that's correct.

MEMBER POWERS: Okay, so it's all the same. It has two coatings 40 mils thick, something like that?

MR. MILLER: Originally applied, six to eight mils.

MEMBER POWERS: Six to eight mils. Then

you said it was just a carbon coat?

MR. MILLER: Carbozinc 11 and Dimetcote 6.

MEMBER POWERS: Okay.

MR. DIRADO: Slide 14, please. This slide depicts the current material condition of the Unit 1 liner using data from our 2012 refueling outage. The total submerged surface area affected by corrosion is graphically shown on the y-axis as a function of liner metal wall loss. The first vertical dash line is the ten percent liner wall thickness value of 25 mils.

The acceptance limits for large area corrosion, 125 mils, and for local corrosion, 187.5 mils, are also shown as dashed vertical lines. The large area corrosion is depicted by the colored bars on the graph.

The first bar shown in green indicates that 84.8 percent of the submerged liner surface has intact coating. The second bar shown in yellow indicates that 12.6 percent of the submerged liner surface is affected by gentle corrosion that ranges in average depth up to 25 mils.

The third bar, shown in blue, indicates that 2.6 percent of the liner surface is affected by gentle corrosion that ranges in average depth from 25 to 50 mils. The fourth smaller bar, which is shown in

red, indicates that a very small portion, 0.03 percent of the liner surface, is affected by gentle corrosion that has an average depth of 50-57 mils.

The large area of data demonstrates that 97.4 percent of the submerged liner surface area has less than or equal to ten percent wall loss, all of which is well below the 125-mil large area acceptance limit.

This slide also depicts individual local areas of general corrosion less than 2.5 inches in diameter. The right hand side y-axis is the number of the locations as a function of metal loss. Locations with corrosion greater than 50 mils in depth are depicted by green diamonds.

The acceptance limit for these areas, 187.5 mils, is shown as a dashed vertical line. As can be seen from this graph, a few local areas of general corrosion with greater than 50 mils metal loss have been observed. Those locations that have been identified are well below the corrosion limit of 187.5 mils.

MEMBER BANERJEE: How have these areas evolved over time, do you have any idea? Those diamonds, for example?

MR. DIRADO: Yes, the local areas of

general corrosion are examined frequently. The corrosion rate is understood. It's a general corrosion rate of less than two mils. The majority of the locations in the Unit 1 pool have been recoated to arrest the corrosion, and subsequent examinations will be performed per the plan to ensure that those locations don't recur or the coating does not degrade.

MEMBER BANERJEE: So suppose I took one of those diamonds, where were they five years ago?

MR. KELLY: I'd like to ask Mark Miller of the project team to address that, Dr. Banerjee.

MR. MILLER: My name is Mark Miller and I'm a member of the Exelon License Renewal team. Concerning the diamonds, there are 62 areas of spot corrosion exceeding 50 mils. Of those, 26 have been recoated to date, 22 of those were performed during this last outage in 2012 for Unit 2.

Many of those were identified during 1R, excuse me, the 2012 outage for Unit 1. However, four diamonds or areas of spot corrosion that are the largest metal loss are on a single plate and they have been recoated, and the very earliest inspections on those plates identified large areas where there was mechanical damage to the liner plate.

MR. GALLAGHER: I think we're not

answering Dr. Banerjee's question. Our 2012 outage for Unit 1 was the first outage where we had the criteria of the 50 mils that we were looking for to spot recoat, so I don't think we have, you know, a direct comparison of, have we observed them before, and then didn't recoat it and then saw what they are.

The only thing I can offer to you, Dr. Banerjee, is if we go to, we have a backup slide. I'd like to go to Backup Slide 25. So we do have some comparison on our larger area, okay, and because we had done inspection in 2006, and we did an inspection in 2012, 2012 was the more thorough inspection with our new Aging Management Plan being initiated. But you can see here that there wasn't really much of change between 2012 and 2006.

MEMBER BANERJEE: So the hashed ones are the 2006?

MR. GALLAGHER: Correct, correct. And then the first bar is the 2006 inspection, the second bar is the 2012 inspection. And there wasn't really much change between the two, because, you know, we've done studies on the corrosion mechanism and our evaluations show it should be about 2 mils a year or less, and the data that we've taken actually bears that out.

MEMBER BANERJEE: And there's no new areas that's cropped up in these five years?

MR. GALLAGHER: No, because they were pretty much the same. There might be some recharacterization, but you can see the general percentages are about the same.

MEMBER BANERJEE: Okay. I think that --

MEMBER SHACK: But there's some degradation that's --

MR. GALLAGHER: Yes, and we expect that really, until, you know, our plan is to initiate the Coating Maintenance Plan so we would take care of those areas and not have further degradation. So we have just initiated that plan, but this is like a comparison of apples and apples, if you will.

MEMBER BANERJEE: Yes, over 50 mils, if I read this correctly, because of the way this graph is done it de-emphasizes that but you've seen some significant increase in degradation at that level, right? The red solid is --

MEMBER SHACK: Well, he's not showing the spots here which is unfortunate.

MR. GALLAGHER: Yes, there's no spots on here. We're not showing the spots. This is just the general area.

MEMBER SHACK: The general area of corrosion. So he doesn't really have what you're looking for, but the general area of corrosion is --

MEMBER BLEY: We can infer a little bit of them --

MEMBER SHACK: Infer, right.

MEMBER BLEY: The 25 to 50 mils went down a little, and I suspect that's, a few things got bigger than 50.

MR. GALLAGHER: But, you know, and our plan is focused on spot recoating those local areas greater than 50 mils so we can prevent the development of the larger areas, if you will. And so we think by doing that, you know, we should keep on top of it.

MEMBER BANERJEE: And your detection of these areas is quite reliable?

MR. GALLAGHER: Yes, the --

MEMBER BANERJEE: You know, inspections?

MR. GALLAGHER: Yes.

MEMBER BANERJEE: How do you see them in particular? Do you do a visual?

MR. GALLAGHER: Yes. Okay, we do have, Mark, why don't you give a discussion on the inspection technique?

MR. DIRADO: Right. All the inspections

are done by underwater divers that perform a VT-3 inspection. It's a visual inspection. They use calibrated tools to determine the depth of any local area spots of corrosion, and they have a specific set of procedures and tools in hand to be able to assess the areas of either coating loss or corrosion to which they present back to the Station for our review and oversight.

MEMBER BANERJEE: And typically this is seen as a difference in contrast on the surface? I mean if --

MR. DIRADO: We're going to have a picture, I think.

MEMBER BANERJEE: Oh. Well, maybe I should just wait then.

MR. DIRADO: Okay, go ahead.

MR. GALLAGHER: Yes, we, basically what we're trying to do here, Dr. Banerjee, is give a, we gave a presentation at the Subcommittee. We're trying to give Dr. Shack, trying to give the same amount of information in a smaller presentation, but we think we have all the information, so I think we'll be --

MEMBER BANERJEE: Okay.

MEMBER SCHULTZ: Related question on timing. You indicate in the presentation that the

suppression pool water quality meets the VIP guidelines, and can you give us some history on when those were instituted and for how long the guidelines have been attained?

MR. KELLY: Yes, I'd like to have Greg Sprissler of the Plant Chemistry Department address your question, Mr. Schultz.

MEMBER SCHULTZ: Thank you.

MR. SPRISSLER: Good morning. My name is Greg Sprissler. I'm with the Limerick Chemistry Department. Limerick Station, since day one, has been following BWR guidelines for suppression pool chemistry.

We have data from 1995 to present. It shows typical chloride concentration of about two to three parts per billion. It shows sulfate concentrations of about ten to 15 parts per billion. TOC, which is total organic carbon, typically 30 parts per billion, and conductivity three micromhos against a goal of five.

So the history of Limerick's chemistry of the suppression pool has been within the BWR guidelines.

MR. KELLY: Thank you.

MR. SPRISSLER: You're welcome.

MEMBER SKILLMAN: On this slide, please, a programmatic question. The gentleman from Chemistry mentioned that there are 62 locations. This chart shows 11 greater than 50 mils. For either the 62 items or the 11, does each one of these have a name tag in your corrective action program so that the corporate memory of the team knows where to go, where to look, so it's back on the identical location?

MR. KELLY: Yes, Mr. Skillman, the findings here are all captured in the corrective action program.

MEMBER SKILLMAN: Does each item have it's own name tag?

MR. KELLY: Not individually, not necessarily individually. It may be by a plate or it may be by a location.

MEMBER SKILLMAN: I would just offer that I was involved in a plant that had boric acid leaks, and each leak location had its own ID so that the boric acid corrosion program owner and the site could know exactly where that indication was so that it could be tracked and repaired.

So if each one of these is not identified uniquely, then I would suggest that is something that you need to look at.

MEMBER SHACK: They've lost one point on the graph, because our graph shows a point at 125 and there's doesn't.

MR. KELLY: Now moving forward, Mr. Skillman, as part of our plan, you know, the plan is to address these spots in the outage of discovery. So when we find a 50-mil spot of small, localized corrosion, moving forward, we will recoat it in the outage of discovery.

MEMBER SKILLMAN: What I'm thinking is that this is a very large area --

MR. KELLY: Yes.

MEMBER SKILLMAN: -- and it could be easy for a diver to say, well, I think it was here, but it was really over here.

MR. KELLY: You're right.

MEMBER SKILLMAN: In which case you've got a miss, and this is the membrane for your containment.

MR. KELLY: You're right.

MR. DIRADO: And we do take detailed measurements and locate it in the final reports. We have a good understanding as to where those are.

MEMBER SKILLMAN: Thank you.

MR. KELLY: You're welcome.

MR. GALLAGHER: Yes, Dr. Shack, I don't

know what happened but our, I mean the slide I have, the highest point is 122 mils, and we talked about that at the Subcommittee, and that was spot recoated. I don't know why it's not --

MEMBER SHACK: Recoated it and just got rid of it.

MR. GALLAGHER: I don't know why it's not in there. It was on there before. We'll make sure we get the right chart.

MEMBER BANERJEE: So does it mean that those others haven't been recoated?

MR. GALLAGHER: No. No, it should have been shown. Okay, and Mr. Skillman, we'll take that under advisement. We have been capturing by plate, but we'll look at more individual characterization.

MEMBER SKILLMAN: Thank you.

MR. DIRADO: Slide 15, please. This slide depicts the current material condition of the Unit 2 liner using data from the 2009 refueling outage. The information is presented in a similar fashion to that on the previous slide.

Same conclusions are drawn for Unit 2, mainly that the majority of the coating, more than 95 percent, is intact, and that there are few local spots greater than 50 mils in depth. Slide 16, please.

This slide provides a picture of what the liner corrosion looks like. The area shown is approximately one square foot of the surface area on Unit 1 floor plate 9 Alpha. The picture represents a plate surface that's affected by general corrosion that's occurring at a rate of less than 2 mils per year in the suppression pool.

MEMBER BANERJEE: So those dark, the smallest dark areas they're about what, less than quite a bit like an eighth of an inch or --

MR. KELLY: Yes, I can address that Dr. Banerjee. First of all, this is a one square foot area so it's quite small. When we see a localized spot they're typically an eighth of an inch in diameter. We define small as less than two and a half inches, but the vast majority are a fraction of an inch.

MR. DIRADO: And just for information, so the areas on where corrosion is visible have experienced coating depletion.

That estimated coating depletion on this plate in particular is 40 percent, and the average metal loss due to general corrosion is 17 mils in depth, and has less than ten percent wall thickness loss. And the unaffected areas still have their

inorganic zinc coating present and it's protecting their liner surface.

MEMBER BANERJEE: So when you go and repair this, you basically recoat it in the whole region or just specific spots? Like we see a rather extensive region at the bottom, right, so --

MR. GALLAGHER: Yes, if you go to our Slide --

MR. KELLY: Slide 17.

MR. GALLAGHER: -- the next one. Dr. Banerjee, this is our overall coating maintenance plan, and basically what we do is we spot recoat areas that are greater than 50 mils in depth and larger areas that are greater than 25 mils.

And then to get to your question, we also have what we consider is a proactive addition which is we recoat plates, and this would be larger areas where there's coating depletion greater than 25 percent. And so the corrosion level could still be less than ten percent wall loss. So that gets to the wider area and gets it before there's any significant metal loss.

But with that Mark can explain this --

MEMBER BANERJEE: No, I think it's clear.

MR. GALLAGHER: Mark?

MR. DIRADO: This slide summarizes the

enhancements made to the IWE Aging Management Program for the suppression pool. The enhancements will maintain the suppression pool coating protection and minimize liner metal loss.

This plan includes removal of accumulated sludge in the suppression pool every refueling outage. This minimizes potential corrosion sites. An ASME examination of the submerged liner surface in the suppression pool is also conducted once each ISI period, which is three times in ten years.

MEMBER POWERS: What is your sludge?

MR. DIRADO: The sludge composition is primarily composed of corrosion products. It's believed to be small amounts that are influxed from attached --

(Crosstalk)

MR. KELLY: Is that good, or did you want a little more on that, Dr. Powers?

(Crosstalk)

MR. KELLY: Mark Miller of our project team, I think, can address your question, Dr. Powers.

MEMBER POWERS: Mark's going to get sore knees by the time the day's over here.

MR. MILLER: I'm Mark Miller and I'm a member of the Exelon License Renewal team.

(Off the record comments)

MR. MILLER: We have data from when we've removed sludge during the outages, and we've been averaging about a 100 pounds of sludge a year based on that information.

MEMBER POWERS: Do you have any idea of what it's made of?

MR. GALLAGHER: The composition, Mark, is what he's saying.

MR. MILLER: I'm not aware of the composition. I don't believe we've had analysis done on it.

MR. KELLY: Yes, we have not had any chemical analysis on it done.

MEMBER POWERS: You know what it looks like. Does it look like rust and magnetite, or is it boric acid?

MR. KELLY: Dr. Powers, I'd like to ask Greg Sprissler of Station Chemistry. Maybe he can address that, of what the sludge looks like, Greg? No?

MR. MILLER: How about Mark Marquis?

MR. KELLY: We have another Mark.

(Crosstalk)

MR. GALLAGHER: Mark is our diver

contractor.

MR. KELLY: UCC, he's the guy.

(Crosstalk)

MR. MARQUIS: Good morning. My name's Mark Marquis. I'm with Underwater Construction Corporation, NDE Level III. The sludge composition is, there is some corrosion product mixed in, but trying to describe exactly what it looks like, it's film-like in consistency if that helps provide a visual.

MEMBER POWERS: Color? Brown or red?

MR. MARQUIS: Generally brown.

MEMBER POWERS: I mean it sounds like it's a little bit of rust and a lot of dirt.

MR. MARQUIS: Yes.

MEMBER POWERS: Maybe a little chicken fat, I mean organics that have polymerized.

MR. GALLAGHER: Okay, Mark?

MR. MARQUIS: Thank you.

MR. DIRADO: In order to address the NRC staff questions associated with visual inspection techniques, ultrasonic thickness measurements will be performed on four areas of the liner affected by general corrosion. The UT will be implemented whenever examinations are conducted, and are used to

validate the visual inspection techniques and results.

MEMBER BANERJEE: So the sludge is cleared out at every outage?

MR. DIRADO: Yes.

MEMBER BANERJEE: And it's about 100 pounds?

MR. DIRADO: That's correct.

MEMBER BANERJEE: Low fiber?

MR. GALLAGHER: We can't have --

(Crosstalk)

MR. KELLY: I refuse to answer.

(Laughter)

MEMBER POWERS: On the grounds that you don't want to participate in a three-hour discussion, right?

MR. KELLY: That would be a very smart move.

MR. GALLAGHER: Okay, Mark?

MR. DIRADO: Prior to the period of extended operation the results of the examinations will be used to implement the Coating Maintenance Plan as outlined on this slide. The prioritized approach shown is an enhancement to the program as a result of the SER Open Item resolution.

By spot recoating small locations at

greater than 50 mils upon discovery we prevent the development of the larger affected surface area corrosion. This action is based on how the zinc coating depletes in a Limerick suppression pool environment, starting with very small areas that then deplete radially. Spot recoats are the highest priority. We choose to spot recoat in the outage of discovery.

In addition to the more immediate spot recoats, plates with more than ten percent wall loss or 25 mils will be prioritized for a large area recoat. And as a proactive measure, plates with more than 25 percent surface depletion will also be prioritized for recoat regardless of metal loss.

During the PEO the Coating Maintenance Plan will also be continued as shown on the slide. Localized areas that are greater than 50 mils and the large areas of corrosion with corrosion depths greater than 25 mils will be recoated in the outage of discovery.

And as a proactive measure, plates with more than 25 percent surface depletion will also be recoated, regardless of metal loss, by the next inspection. This plan will continue through the periods of extended operation to ensure the coating

protects the liner and in order to minimize liner material loss. Slide 18, please.

The IWE program was further enhanced to include the recoat criteria used during downcomer inspections. Using the results of ASME IWE inspections of the submerged portions of the suppression pool downcomers areas affected by corrosion will be recoated as shown on the slide.

MEMBER SHACK: I always have a problem with the language that you use to describe this, because I would hope that you're going to recoat all areas with more than 40 mils of loss. And that what you mean by a larger area of 30 mils is an area with loss greater than 30 mils that's larger than 5.5 inches.

MR. GALLAGHER: That's right.

MR. DIRADO: That's right.

MEMBER SHACK: You really ought to say that instead of this backward way that you have it now where you have to sort of infer what a larger area is because you've defined the local area.

MR. GALLAGHER: Yes, I see what you're saying. Yes, or basically what we're saying is the local areas, the criteria's 40 mils. The larger area's criteria is --

MEMBER SHACK: Everything greater than 40 mils is going to, even if it was larger than 5.5 inches you'd coat it.

MR. GALLAGHER: Yes, could it be greater than 30.

MEMBER SHACK: Well, yes. You get into that logic. It would be easier just to say you're going to recoat all areas greater than 40 mils and areas greater than 30 mils that are larger than 5.5 inches.

MR. GALLAGHER: Okay. Yes, that's the intent.

MEMBER SHACK: That's the intent, just a firmer way to state it. And you have the same problem in the liner, our unit where it's 2.5 inches.

MR. DIRADO: So these criteria will also be used to determine when submerged portions of the downcomers require augmented inspections in accordance with Section XI. Currently none of the downcomers on either Unit 1 or Unit 2 meet the criteria for augmented examination or recoat. Slide 19, please.

In summary, the enhancements to the Limerick IWE Aging Management Program ensure that aging of the suppression pool liner will be managed appropriately. Limerick has a Mark II containment

design with a metal liner that is 100 percent thickness margin. The water chemistry quality in the suppression pool minimizes general corrosion reflected in a low corrosion rate less than 2 mils per year, which is confirmed by examinations.

Exelon is committed to an Aging Management Program begun well in advance of the period of extended operation, which ensures that the intended function of the suppression pool liners for both Limerick units is maintained throughout the periods of extended operation.

MR. GALLAGHER: And that concludes our presentation pending any questions you may have.

MEMBER SCHULTZ: Michael, with regard to this particular issue and thinking about operating experience, both incoming and outgoing with regard to Limerick, is this an isolated problem? What is the industry doing or what is the industry conditions? How would that be characterized by Exelon?

MR. KELLY: I think I can address that, Mr. Schultz.

MEMBER SCHULTZ: Thank you.

MR. KELLY: First of all, the Mark II containment seems similar in design but they're all different. We're very similar to a Susquehanna unit

but other Mark IIs are different. Some have stainless steel liners and some have different, they have epoxy coatings. For instance, Columbia that was here has an epoxy coating. It's not the zinc.

So really, they're all different when you look at them in detail including the design and the layout. And so I think perhaps Susquehanna's probably our best benchmark in that regard and we do keep in contact with them.

MEMBER SHACK: But still, your materials are just like a Mark I torus.

MR. KELLY: True, yes.

MEMBER SHACK: And your coating degradation is right on, in fact, it may be worse than some of the Mark I torus's. If you look at Duane Arnold or Cooper, you know, they've got coating loss too so, you know, I suspect you're going to be doing lots of patching.

MR. KELLY: Yes.

MEMBER SHACK: The good news is they don't have a torus that's twice as thick as it needs to be.

MR. KELLY: Right.

MR. GALLAGHER: And we took that kind of operating experience from the Mark Is and that's how we developed our Coating Maintenance Plan. And we

think that, you know, we've transitioned from an inspection program to an Aging Management Program at the right time. So we think that we're early in getting ahead of this, and versus some of the other, the Mark II, some of the Mark I plants were later on in life.

MEMBER SHACK: Your coating degradation seems to be somewhat localized too in the sense that you've got like 15 percent overall but you've got a plate with a 40 percent loss, which means that there are other plates that have very little.

MR. KELLY: That's true, yes.

MEMBER SHACK: And so whether somebody messed up the coating application or something in that particular one or --

MR. KELLY: It could have been mechanical damage. It could have been a number of things to start that's hard to put your finger on it today, but you're quite right. There are four to five plates on Unit 1 that when we get them we'll be back to a very good place.

And you're talking about 11,000 square feet of exposed area, 6,000 on the walls and 5,000 on the floor, and quite a large fraction is still intact at full dry film thicknesses.

MEMBER POWERS: I would say --

MEMBER SHACK: So you did use the operating experience.

MEMBER POWERS: -- from all the steel in the water, I mean this is kind of the corrosion you would expect after this number of years of operation.

MR. KELLY: Yes.

MEMBER POWERS: I mean I think it's unavoidable with this kind of coating system. And there are more modern coating systems that probably perform better, but I mean it didn't look outrageous to me.

MEMBER SHACK: Any more comments or questions from the Committee?

MEMBER SCHULTZ: One question. With regard to the first-in to the GALL program Rev 2, what we heard from the NRC's position that they thought it was a good experience. What's your take on it?

MR. KELLY: Yes, I can answer that. It was very good, you know, much improved from GALL Rev 1. We had over 5,000 line items, you know, for aging management review and more than 95 percent of those were standard A&C notes as they called the meeting. We had a perfect match with, you know, material, environment and aging effect. So that made our job

easier and I think it made the staff's job easier too.

So, you know, we had a lot of good matches. There were better matches for environment and material in GALL 2. Also the aging management programs themselves, I think, were consolidated well and it enabled us to what I say write a better program.

There was better internal consistency in the program in GALL. Some of the one-time programs that require a sample, a population, the samples were better defined in the GALL. So that was very clear-cut and very easy to meet, so that also helped us tremendously in, you know, putting a good, quality application together.

MEMBER SCHULTZ: Thank you.

MR. KELLY: You're welcome.

MEMBER SHACK: Thank you very much.

MR. GALLAGHER: Thank you.

(Off the record comments)

MR. MILANO: Good morning, Chairman and members of the ACRS. Again my name is Patrick Milano. I'm the License Renewal project manager for the staff's review of the Limerick Generating Station application.

I'm here today to discuss the review of

this application as documented in the Safety Evaluation Report issued on January 10th of this year.

As Mr. Lubinski made the introductions for the staff members that are at the table, however, I'd like to also state that seated in the audience are members of the technical staff who participated in the review of the License Renewal Application or were at audits conducted at the plant. Next slide, please.

This is just a general overview of what we're going to present today. We're going to give you a short overview. We're going to talk about the closure of the open items and then our overall conclusion. Next slide.

As indicated on this slide, the staff issued its Safety Evaluation Report with Open Items on July 30th, 2012, and the staff met with the ACRS Subcommittee on License Renewal, as Mr. Shack indicated, on September 5th of 2012.

The open items that were discussed at that time are now closed, and the final Safety Evaluation Report was issued on January 10th of this year and covered most of the information on this slide also. Next slide, please.

As you're aware, in its Memorandum and Order on August 7th of 2012, the Commission addressed

the court's ruling striking down our current waste confidence provisions. The Commission noted that it was now considering all available options for resolving the waste confidence issue, which could include generic or site-specific NRC actions or a combination of both.

But in recognition of its duties under the law, the Commission stated that the NRC will not issue licenses dependent upon the waste confidence decision or the Temporary Storage Rule until the court's remand is appropriately addressed. Because of that determination, because that determination extends just for the final issuance of licenses, the Commission stated that all licensing reviews and proceedings should continue to move forward.

Late last year the License Renewal staff met with the members of the ACRS to discuss options to continue their review and meetings with the ACRS during this period when the issuance of renewed licenses is on hold.

We mentioned that the staff will likely continue to address issues, and that could come about from its review of annual updates to the License Renewal Applications or the evaluation of operating experience. The latter could result in the staff

deciding to prepare Interim Staff Guidance documents.

Although the staff's overall conclusion may not change after reviewing the new information, it's likely that a revision or a supplement to the SER may be needed. In order to continue with the deliberations with the ACRS leading to the ACRS issuing that decision letter, the License Renewal staff proposed to take certain actions.

First, we would continue to provide the ACRS with copies of documents prepared by both the staff and the applicant addressing any new technical information. In addition, the staff would provide any changes or supplements to the SER and its findings to the ACRS.

Second, on about three to four months prior to the expected date of issuance of a renewed license, the staff would provide a summary description of the changes made to the SER after it was presented in a full Committee meeting.

Third, pending the ACRS review of this information, the ACRS could make known whether it desires to have a follow-on meeting to discuss this new information and the staff's findings. If the ACRS decides not to, the staff would request that the ACRS agree that the prior letter, decision letter, remains

as the final ACRS decision on the subject of the License Renewal Application.

As I noted earlier, the License Renewal staff met with the Subcommittee in September, and in addition to making some minor corrections to the SER presented at that time the staff provided its summary and findings regarding the two open items that were previously discussed. Thus, the staff will only be addressing its review and findings related to closure of the open items in today's presentation. Next slide.

As you are aware, the applicant's aging management programs, which we call AMPs, should contain the element of operating experience. In this regard the staff verifies that the applicant has appropriate programs or processes for the ongoing review of both plant-specific and industry operating experience concerning age-related degradation and aging management.

The AMPs should either be enhanced or new AMPs developed as appropriate when it's determined through the evaluation of operating experience that the effects of aging may not be appropriately managed.

License Renewal Interim Staff Guidance 2011-05 states that acceptable AMPs should be informed

and enhanced when necessary based on the ongoing of operating experience. It also states that any enhancements to the existing operating experience review activity should be in place no later than the date the renewed operating license is issued and then implemented on an ongoing basis throughout the term of the renewed license.

The applicant described several enhancements to its operating experience program during the Limerick review, however, it initially planned to implement them some time after issuance of the renewed licenses. Therefore, the staff could not determine whether age-related operating experience would be fully considered in the period between the issuance of the renewed licenses and implementation of the enhancements.

In response to this open item, Exelon stated that all of the enhancements will be implemented no later than the date when the renewed licenses are issued, and the associated activities will be conducted on an ongoing basis throughout the terms of the renewed licenses.

The staff finds this response acceptable because it's consistent with the guidance in the Interim Staff Guidance, thus closing out this item.

Next slide, please.

This existing AMP was enhanced by the applicant to address the inspection of the primary containment components exposed to treated water environments. The AMP manages loss of material from corrosion and the possible loss of leak tightness.

As detailed in its open item, the staff had issues with inspection methods, frequency, and criteria used for selecting locations for recoating. By that I mean the criteria for coating degradation, general corrosion, and pitting or local corrosion.

In its review, the staff was not clear how the coating degradation could be effectively identified for each liner plate under water in the suppression pool. Further, the staff was concerned about the quality of the visual examination using depth gauges underwater to measure the loss of liner plate thickness due to general corrosion and pitting/local corrosion.

Lastly, the staff noted that the acceptance criterion for the degradation of the downcomers was not identified in the AMP or the associated procedures. In response to the open item, the applicant enhanced the ASME Section XI Subsection IWE Aging Management Program, specifically the

enhancements, and again this is somewhat of a repeat of what Exelon had said in its presentation.

First, they increased the frequency of plate inspection, resulting in the interval between plate inspections not being more than 48 months rather than the 120 months allowed by the ASME code. To manage degradation and corrosion of the liner plate during the period of extended operation, the applicant committed to enhance the program by using the results of the ASME IWE examinations to implement a coating maintenance plan.

Third, the applicant would expedite the schedule for locally recoating the suppression pool liner plate in areas affected by corrosion to impede further corrosion, and more stringent acceptance criteria for recoating and liner plate repair was initiated.

Fourth, it would add criteria for augmented inspection of the liner plate and recoating of the downcomers and committing to perform ultrasonic thickness examinations to complement liner plate thickness measured using depth gauges.

And lastly, the applicant revised the AMP to use the results of the ASME IWE inspection of the submerged portions of the suppression pool downcomers.

MEMBER SHACK: When I look in Appendix A at the Commitment 30, I can't find the four years in there. It just says, you know, each ISI period. And where is the, the four years is mentioned in the text but it's not in the Commitment, so where has the applicant committed to the four years?

MR. MILANO: I'll start out and then I'll ask Mr. Sheik to further clarify. The commitment is to do three examinations in a ten-year ISI interval. Because Limerick is on a 24-month operating cycle that equates to once every other outage, which is four years, except that, you know, to get the fourth one in you're going to have to adjust just when you do a third inspection.

Do you want to say anything else?

MR. SHEIK: Yes, then you have, you know, ten years, and they have to three inspections and the outage is every 24 months. So they would have two inspections at 48 months and one inspection at 24 months.

MEMBER SHACK: Okay.

MR. MILANO: We're on Slide 7. The staff reviewed the proposed enhancements to the AMP, and associated commitments is noted on this slide, and found them sufficient and acceptable for managing the

aging effects of corrosion on the liner plate. The staff found that the program elements for which the applicant claimed consistency with the GALL report are indeed consistent with the corresponding program elements of the GALL report AMP XI S-1.

The staff also found the applicant's response concerning owner-established criteria for the recoating of downcomers acceptable because it's based on the original design calculations and supplemental analysis.

In conclusion, as I indicated at the start of the presentation, the staff will continue to review elements of the application following the annual updates provided by the applicant during the period until licenses are again issued and when operating experience dictates the need for the staff to process Interim Staff Guidance.

In conclusion, on the basis of its review to date, the staff has been able to determine that the requirements of 10 CFR 54-29(a) have been met for the License Renewal of Limerick Generating Station. This concludes my presentation subject to any further comments or questions from the ACRS.

MEMBER SHACK: There are no further questions. Thank you very much. I'll turn it back to

you, Mr. Chairman.

CHAIR ARMIJO: Well, I congratulate everyone for really moving this through. We're about an hour ahead of schedule. What I'd like to do is call for a 15-minute break, and then I'd like the Committee to meet on some of our own internal stuff to fill in until we restart on the Component Fabrication presentation. Maybe we can talk about some letters we have to do.

So let's take 15 minutes. I'll give you a margin. Come back at ten until. That's well more than 15 minutes. And thanks everyone.

(Whereupon, the foregoing matter went off the record at 9:34 a.m. and went back on the record at 10:45 a.m.)

CHAIR ARMIJO: Okay, let's start. Next item on the agenda is a review on the Large Component Fabrication and Vendor Inspection Program. The Subcommittee Materials, Metallurgy and Reactor Fuels met on January 16th and received a very detailed briefing of the staff's work in this area.

They covered a vendor inspection program, a recent inspection findings and trends, international engagement, which is very important, as well as various examples of findings and activities on large

component inspections. This was at the request of the ACRS to bring us up to date on what's going on now that we're building some power plants.

With that I'd like to, we'll have an abbreviated presentation this morning and this will be led by Mr. James Luehman of the Office of Fuel Reactors. Jim, go ahead.

MR. LUEHMAN: Thanks. Thank you, Mr. Chairman, Members. Good morning. My name is Jim Luehman. I'm the deputy director of the Division of the Construction Inspection Programs, and vendor inspection is part of our responsibility.

As the chairman said, we previously provided a version of this presentation at the Subcommittee level, and we're here to do it at the full Committee level. We're going to have a number of presenters, so please excuse us for changing out as we go.

But I'm just going to say we appreciate this opportunity and then I'm going to turn it over to Ed, and Ed's going to start us out, and we'll be rotating through a number of the staff to give you the full presentation. Ed?

MR. ROACH: Thank you. Thank you, Jim. Good morning, Members, Chairman. I'm Ed Roach, chief

of the Mechanical Vendor Branch of the Office of New Reactors.

I have about 27 years of industry experience in various aspects of operations including quality assurance, auditing, health physics, radioactive waste packaging and shipment, emergency preparedness and outage management. I've been with the NRC since about 2006 and I've served in the offices of NSIR and NRO as an EP specialist, health physicist, technical reviewer, and branch chief.

I'm going to discuss the recent approach we've taken to maximize our effectiveness in several areas, but primarily how we're approaching vendor inspection for nuclear reactor vendors.

Just to focus on how important this area is viewed, the number two goal for the Office of New Reactors is the following. To implement the agency's Reactor Vendor Inspection Program, including inspection, outreach and communication to stakeholders, and self-assessment in support of operating and reactor safety and new reactor construction. Okay.

One of the things that I'd like to cover today in today's briefing, provide a context of our Vendor Inspection Program and the presentations that

follow by discussing our regulations and guidance and the types of inspections we perform, our Vendor Inspection Program plan and the selection criteria.

I'll conclude today with a discussion, a brief introduction to what we call our Center of Expertise, and NRO is the Center of Expertise for vendor inspection.

The Division of Construction Inspection and operational programs in the Office of New Reactors is responsible for construction inspection. For new reactors, the construction inspection program is implemented in four main areas.

Vendor inspections, quality assurance implementation inspections, operation of program inspections and verifications of ITAAC, Inspections, Tests, Analysis and Acceptance Criteria. Today's discussion will be focused again as I said on the Vendor Inspection Program. Thank you.

As I'm sure you are aware, the NRC does not license vendors. However, the NRC does hold power plant licensees responsible for effective implementation of the quality assurance program, oversight of contracted design and construction activities, and vendor oversight. Therefore, ultimate responsibility for safety always lies with the

licensee.

Licensees accomplish vendor oversight by directly qualifying their suppliers through audits and surveys where they use qualification audits and certifications performed by third-party oversight organizations such as the Nuclear Procurement Issues Committee, NUPIC, or ASME, the American Society of Mechanical Engineering, as long as they verify that the third-party audit or certification covers the complete scope of supply and is directly applicable to what is being procured.

First-tier suppliers are responsible for passing quality assurance and technical requirements to lower level suppliers through purchase orders, and ensuring compliance via audits and surveys. Licensees impose quality assurance requirements of Appendix B of 10 CFR Part 50 to their suppliers of basic components. And vendors of basic components must meet the Defect and Noncompliance reporting requirements of 10 CFR Part 21.

Consequently, NRC inspects the vendors to verify that licensees are meeting their Appendix B vendor oversight responsibilities and that the vendor is meeting its contractually imposed quality requirements.

The NRC has had a Vendor Inspection Program for over 30 years. The program has varying levels of emphasis corresponding to resource levels and shifting priorities throughout those years, but the program remains largely responsible for inspecting vendors providing components to the operating fleet.

With the anticipation of the new reactor construction, the new reactor Vendor Inspection Program was established back in 2007. As stated previously, this program was established to verify the implementation to quality assurance requirements of Appendix B to 10 CFR Part 50, and the reporting requirements of 10 CFR Part 21.

As you can see, we increased from 24 inspections in 2011 to 27 inspections in 2012, and we're currently on track to complete our planned 30 inspections this year.

As I alluded to earlier, these are the regulations that apply to vendors that supply basic components, Part 21, 10 CFR 50.5, 10 CFR 50.7, and Appendix B by contract. Suppliers of basic components must comply with Part 21. If the supplier fails to meet those requirements a Notice of Violation is issued.

10 CFR 50.55a Codes and Standards, applies

directly to nuclear power plant licensees and requires them to design, fabricate, erect, construct, test and inspect structures, systems and components to quality standards commensurate with the importance of safety function to be performed. Nuclear power plant licensees must also meet the requirements of certain quality standards, ASME codes, and IEEE standards.

Appendix B to 10 CFR 50 establishes the 18 quality assurance criteria to nuclear power plants. Since nuclear power plant licensees are required to meet codes and standards as described in 10 CFR 50.55a, they must include the applicable technical and quality requirements included in Appendix B in purchase orders to vendors.

If a vendor does not meet the technical requirements in the purchase order, the vendor will be issued a nonconformance against the appropriate criteria in Appendix B such as design control, special processes or test controls. Following me, Rich McIntyre will talk a little bit about some of our findings that we've established and identified in the recent inspections.

In 2010, the Division of Construction Inspection and Operational Programs, DCIP, implemented recommendations to improve the Vendor Inspection

Program. Among those improvements the Vendor Inspection Program plan was authored, a document that articulates a clear purpose for the Vendor Inspection Program, and 2, establishes metrics to evaluate the program's success.

With its development and subsequent revisions, the Vendor Inspection Program has been guiding the vendor program ever since. While the Vendor Inspection Program plan describes how the program will be established, the actual inspection process is described in Inspection Manual Chapter 2507, and it's implemented through a variety of inspection procedures that deal with vendor inspection and reactive inspections of vendors.

Although this is inspection guidance to the NRC staff, the Inspection Manual and all of its inspection procedures are always available to the public. Vendors are encouraged to review this guide as a preparation for an announced inspection.

Our vendor inspections fall into two broad categories, routine, which the majority of them are termed routine, that is, a vendor is selected based on a set of established criteria. That vendor is notified at least 30 days in advance, and then the inspection is conducted and a report is generated and

written within 45 days of the exit meeting. Findings and corrective actions are tracked until resolution.

Reactive inspections occur when the NRC becomes aware of information that a supplier of basic components may not be meeting contractually imposed requirements or there is an allegation regarding some NRC-regulated activity.

MEMBER BROWN: Can I ask, in your initial slide you talked about how you don't look at vendors, the licensees are responsible for making sure the vendors do what they're supposed to do under that. So, but yet as you go through these last couple of comments, do you actually go to the vendors to see that they're complying with the basic quality requirements, or are you just auditing the licensee's process for looking at the vendors?

MR. ROACH: We actually go to the, we don't inspect every vendor out there. We have a master list of all the vendors we're aware of and continue to add to that and our inspections are geared to verify that the licensees are actually performing their part of it. However, there are nonconformances and violations that go to the vendors because --

MEMBER BROWN: So you're going to the vendor to see that the licensee is actually requiring

them to do what they're supposed to do, and you -- I'm just trying to connect the dots here.

MR. ROACH: We do both. We ensure that the vendor oversight is adequate. At the same time we evaluate that the vendor is meeting its quality in purchase requirements.

CHAIR ARMIJO: But on a sampling basis.

MEMBER BROWN: No, I understand that. I just was, I got the initial flavor that it was just via the licensee, which I don't have a problem with because the licensee obviously has to be responsible, but you also do that sample basis that the vendors, regardless, you look at the licensees' process for auditing as vendors, and then you independently check that the vendor, on a sample basis, whatever, is following the processes that they're supposed to do, and then getting in the right documentation. Okay, all right.

MR. ROACH: That is accurate. You stated it much clearer than I did. Thank you.

(Crosstalk)

MEMBER BLEY: I've got another question then. Only saying basic components, do we include I&C software and now that we're getting pre-fab stuff, even structural components if we need to?

MR. ROACH: Yes, we do. There's three branches that conduct the vendor inspections. The Mechanical Vendor Branch which looks at structural, mechanical components, pumps, valves. There's the Electrical Vendor Inspection Branch which looks at software, digital I&C, electrical components, instrumentation.

And then the Quality Assurance Branch which also looks at the programmatic quality assurance programs and QA implementation of say new programs, new applications that are coming in.

MEMBER BLEY: Just want to push a little further. Since we have software and I&C sitting in there and they also have computer security issues, do inspections about that come under this, or is that something completely separate?

MR. ROACH: At this point we've been in contact with the cyber security folks but only as parallel. If we find issues where we think there's counterfeit, fraudulent, suspect items, we have a process to make sure that gets elevated and communicated.

MR. LUEHMAN: To answer that a little further, we are coordinating with NSIR to make sure that we, you know, in this emerging area of security,

cyber security, that we have a good interface and that we understand what they're doing and they understand what we're doing, and that we, you know, we create areas of responsibility so that there's not something left in between.

We're still working that out. They have their new cyber regulation in place, and they're working with the licensees on that. It's a couple step process. The first step is that they've got, they're going to have to get licensee implementation for the existing equipment that's already at the sites.

The second part of that, or at least in parallel with that, is they're going to have to work with the vendors of that equipment and the parts for that equipment and get them to now conform to the cyber requirements, passing those requirements down similarly as we do on the safety side through contractual obligations, to ensure that their vendors are now complying with those requirements. So they're working that. We're following them now.

Right now one of the --

MEMBER BLEY: Do they have their own inspectors, or when you do inspections you look for their things --

MR. LUEHMAN: Well, that's what we're working out right now. That's one of the transitions we have to make, because right now we have a set of vendor inspectors that are very conversant on, you know, Appendix B and the requirements there.

We don't have a set of inspectors that are conversant in all the cyber, I mean we have some electrical and I&C inspectors that clearly could be, but we have not taken that on yet. Like I said, we're in negotiations or discussions with NSIR on how to best accomplish this agency-wide.

The other part of it too is there's a bit of a change here because you're going from equipment that's required for safety under Part 50 and Appendix B to some of that equipment which could have security issues, you know, the things that have embedded I&C, et cetera, that are running the plant.

But then you also have all just the security equipment that's in the plant that doesn't operate the plant but there's to monitor the security. That's a whole other set of equipment that to this point we, the Vendor Branch, do not, you know, we don't have oversight and responsibility for that.

So we are working with our counterparts in the security organization and we have ongoing

discussions on those things.

MEMBER BLEY: Okay, great. Thank you.

VICE CHAIR STETKAR: Jim, what is the, I mean you say you have ongoing discussions.

MR. LUEHMAN: Yes.

VICE CHAIR STETKAR: What's the time frame for kind of getting a program in place regarding vendor cyber security inspections, if I can characterize it that way? The reason I ask is we've got a couple of plants being built right now --

MR. LUEHMAN: Right.

VICE CHAIR STETKAR: -- that have digital I&C systems that I suspect people have orders in for already.

MR. LUEHMAN: You're correct, and the -- yes. I'm going to have to, I'll get Rick to help me, but one of the things is that the cyber security rule, and again I won't pretend to be an expert on this, but the cyber security rule has a multi-year phase-in here over the next few years, and that applies to the licensees and the equipment that they presently have.

Now I can't speak with firsthand knowledge as to how we're going to, once they sort of lock down what they have at the plant and say, okay, we've done whatever we need to do to ensure that the present

equipment we have at this plant meets all the requirements, then what the lead-in for additional purchases when that equipment, does that happen at the same time?

In other words, is there a date certain that says, okay, the plant equipment is all cyber-certified, for lack of a better term, and the additional components that they'll have to be able to purchase to repair or upgrade that equipment, is that required on that same day or that same dates to be, in effect, cyber-certified?

We are, again we're working with NSIR to fully understand their implementation plan so that we can build our cyber, so we can build some kind of inspection network. Now whether that's going to be us or whether that's going to be NSIR, that hasn't been decided yet either.

CHAIR ARMIJO: But we're clearly not there yet.

MR. LUEHMAN: We're not there yet, no.

VICE CHAIR STETKAR: And it doesn't sound like we're going to be there by the time that Vogtle and Summer actually procure and install their digital systems.

CHAIR ARMIJO: Unless it's --

MEMBER BROWN: Can I make a comment? There's really a couple of pieces to this thing. You talk about the cyber part, and that's under NSIR and that all comes under 73 point, whatever the number is, is it 4, whatever.

But there's also a control of access issue that's under the design part of the I&C. Control of access falls under the IEEE standards, and it's whether it's control of access within the plant, you know, the access to hardware, then software that you put in the plant, as well as control of access from external the plant which has nothing to do with cyber security, doesn't deal with all the garbage that's going on. It's just control of access from external to internal. And that falls under the architecture and design part.

MR. LUEHMAN: Yes.

MEMBER BROWN: And so without having to deal with cyber plans and all the other nuances that come to that, what I was interested in is, do you all look at that control of access in terms of the way the plant's laid out and the way the networks are set up that feed stuff within the plant and their control of access from the external world? That's within the architecture realm as opposed to, on a control of

access basis not a cyber security basis. It's just one-way communication type stuff.

So somebody needs to be looking at that. That's the critical part when you're first putting this stuff, you know, bringing it from vendors and then everybody's assembling this stuff within the plants themselves.

The other part, that's comment one relative to the discussion. The other question I had relative to what Dennis and John brought up was internal, when you're out looking at the vendors, there's their own, there's an internal design control which for both software and hardware, the part of the designs.

In other words, how do engineers get to modify as their going through the design process? I mean do they maintain a master design, you know, whether they're drawings or whether it's a master set of software versions, et cetera, et cetera, do you all, and that's a design control issue.

The second part of that is how does the vendor maintain that within the plant in terms of its control of access to people being accessed to it on, because the vendors love to put all their stuff -- I about used the wrong word there -- their stuff on this

network within their plants, and their plants typically have external connections to the outside world via the internet, which is just a giant sieve for people to try to hack in.

And if you really want to look at the vendors' plant communications from a control of access, put aside all the cyber-weenie stuff, okay, but the control of access from the outside world into that from a design control standpoint so if that people could muck with some features of either the software, the versions that are being developed, et cetera.

So I'm just bringing that up so that in your deliberations as you're coming up with how you do this there's those points, those separations. So NSIR has their world relative to the cyber part of it, but still we've got to maintain on a design and an architecture, from both the vendors as well in the plant, that control of access so that it's not susceptible to certain types of access.

And those all come under the, what I call the non-cyber security plan type issues. They're just literally designed, as well as internal plant vendor plant network designs, I'm just trying to address the nuances. Because everybody keeps mixing up, and I did

the same thing for two years here, okay, mixing up the 73.54 cyber issue which says, you know, four or five years after we get the license agreed to, you know, the design certification done, that's when we get a cyber plan.

Well, that's got nothing to do with the control of access and the basic architecture design requirements that come under the existing 10 CFR Part, whatever it is, 55 point(a)(h), et cetera, and the IEEE requirements. So I'm just saying, those are the things, some things to throw into your, make it more complicated.

MR. LUEHMAN: Well, if I could ask Rick Rasmussen who's actually our branch chief in the Electrical and I&C area. Rick, I don't know if you've got any comments.

MR. RASMUSSEN: I'm Rick Rasmussen.

MR. LUEHMAN: Help me out.

MR. RASMUSSEN: Well, I can definitely say that we look at the design and control process as it complies with the IEEE standards. The access of a vendor facility, at least access to the software from people, I've never encountered that specific requirement. I'll have to go back and pulse my staff.

MEMBER BROWN: Well, I'll give you an

example in the programs that I came from where I did this for 22 years. We literally set up within the vendors' plants specific protocols and places where that software could be accessed and who was in charge. In other words, nobody could go in and modify a program.

They could take a sample of that over. They could take it kind of like the engineering version, if you will, they could pull it out and say, okay, we're going to work, but the master stayed the same and only one person had the ability to then bring whatever changes in and get them incorporated. And there was limited access.

MR. RASMUSSEN: Yes, and we see that at facilities. A number of our vendors support work for our industry, support for the Navy, things like that.

MEMBER BROWN: I'm aware of that, yes.

MR. RASMUSSEN: And so we see those systems. To the extent that they're actually required by our licensees, I don't know. Rich, do you have any --

MR. MCINTYRE: Yes. In a lot of the safety related computer programs we see exactly what you're talking about. There's probably one individual who is the program analyst, is the only person that

can make changes, version control. He maintains the version control and if there's ever notices of bugs that he has to address, but he's the one individual that can make the changes to the program.

Otherwise, you're right. You don't want to have anybody within even a vendor facility being able to make changes to the computer version. There's usually an assigned individual.

MEMBER BROWN: Yes, a particular version of the program that they're going to be actually installing. Okay.

MR. RASMUSSEN: And they have a complete design control program that describes --

MEMBER BROWN: And you monitor that?

MR. RASMUSSEN: We look at that, yes.

MEMBER BROWN: Okay. And the only other point I'd like to make is that I brought up is, that's good. I don't have any problem with that. And now it's, where is that information located and the control of access to that information, and what does it connect to?

I mean are those programs or the software that's associated with it's going to be installed and PROMS, whatever goes out in the plant, is that on an isolated set of computers or whatever, or does it

have, can it be passed from point to point throughout the plant via some networks or things of that nature? That adds another vulnerability to it even though you have a point of control.

MR. BEARDSLEY: Jim Beardsley. I'm chief of the Construction Inspection Program Branch. Some of the questions you're asking are really things we look at through the licensee inspection program under ITAAC and under the programmatic inspections we'll look at.

So while the vendors, we're looking at the specific vendor activities and how the requirements are being passed down, we're looking at a lot of those types of things and the systematic things. From a system level with inspections of Vogtle and Summer we started to bore into the ITAAC and other inspections there.

So this may not be the 100 percent right forum to ask those specific questions, but I think we are looking at them, in particular, DAC. The DAC inspections, we talked about those with the Committee before. Those inspections we're looking very detailed requirements, the system development processes, the software quality assurance processes, all those kind of things are being evaluated.

MEMBER BROWN: Okay, I'm really trying to, I understand that point. I'm still interested in making sure somebody looks at where is that stuff located memory-wise. It's in some database. The programs are installed somewhere where somebody has access, and then what do those go to?

I understand your other point which are looking at how is the design internal, like the logic and all the other type stuff being monitored and the design checks on the DAC and all that. But that's a subset.

I mean that's within the overall purview of where this stuff is located within the computer systems in the plants, and what type of access other than, you know, even though one got theoretically nobody can come in and do it, how is that limited? What makes sure that guy has that and that there's no other way to come in and contaminate it?

I just want to throw that on the table just to --

CHAIR ARMIJO: You know, this is an interface problem we've been worried about for a long time and I'm sure the staff is too. And we don't really see how the cyber security --

MEMBER BROWN: Don't mix up cyber with

control of access.

(Crosstalk)

CHAIR ARMIJO: Access.

VICE CHAIR STETKAR: You don't want some software vendor's 15-year-old kid having access to --

CHAIR ARMIJO: Exactly.

VICE CHAIR STETKAR: -- the software.

CHAIR ARMIJO: But there's even hardware that comes in from sources that are not --

VICE CHAIR STETKAR: Hardware's a bit more traceable, yes.

CHAIR ARMIJO: Maybe.

(Crosstalk)

MEMBER BROWN: I just wanted to ask the question.

CHAIR ARMIJO: I think we'll move on.

MR. ROACH: Okay, thank you. The NRC staff is currently not resourced to routinely inspect all vendors that provide basic components. Currently there are about 600 vendors, actually more than that now, in our database, and approximately 100 of those are foreign vendors. Inspections are biased towards those vendors supplying basic components for the AP1000 reactor plants being built at Vogtle and V.C. Summer.

The Vendor Inspection Program plan establishes a selection criteria determining the vendors to inspect. This slide shows the criteria that are routinely considered in prioritizing vendors so that we do use operating and construction experience, previous Part 21s, or reports that come in, scope of services, whether or not it's a new first-time component being fabricated for this facility.

And one of our large focuses recently has been on all the type testing and qualification testing for the components being fabricated for the AP1000 plants.

MEMBER SKILLMAN: Ed, as you described 600 vendors, 100 foreign, of the 600 vendors how many of them have their own QA program, their own 10 CFR 50 Appendix B program, approximately? A round, just guess number.

MR. ROACH: Rich, what would you think?

MR. MCINTYRE: I would say most of them. And there will be a part of them that will have commercial programs, but the majority of the Appendix B QA programs, under Appendix B and QA 1.

MEMBER SKILLMAN: Of the 600, the majority?

MR. MCINTYRE: Yes.

MEMBER SKILLMAN: Okay, another question. Of the 100 foreign, how many have an Appendix B 10 CFR 50 program?

MR. LUEHMAN: Most of them.

MEMBER SKILLMAN: Really?

MR. LUEHMAN: I think most or all of them, yes.

MEMBER SKILLMAN: Okay, thank you.

MR. MCINTYRE: At least all of the ones that we've inspected to date have all had Appendix B, and the heavy component manufacturers have an Appendix B and QA 1 as part of their ASME certification process.

MEMBER SKILLMAN: Okay, thank you.

MR. ROACH: I'll talk a little bit about the Center of Expertise for vendor inspection. In recent years the Office of Nuclear Reactor Regulation, and New Reactors, were looking for ways to be a little more efficient, and we basically worked together to establish some centers of expertise. And the one that exists in the Division of Construction Inspection programs is the vendor inspection Center of Expertise. Other ones are listed there that were established.

Previously, NRR performed vendor

inspections of operating reactors primarily on a reactive basis. And we recognized that in the new reactor paradigm we were doing inspections of vendors who supplied to both, as well as looking at that, so there was an opportunity there to be more effective.

And so in many cases the vendors we choose, select and inspect supply to both and we can evaluate their program in a technical implementation of the technical requirements. Next slide, please.

The purpose of our Center of Expertise, it provides a better environment for knowledge management for the vendor inspection staff. Efficiencies are gained by minimizing the level of duplication of effort that occurs during the development, revision and review of guidance and other infrastructure. And the integration reduces the level of overhead required to maintain the expertise in both offices.

In addition, the integration minimizes the level, gives us consistent enforcement actions in inspection effort. The Center for Expertise will provide junior staff better accessibility to senior staff for mentoring and on-the-job training so that they can grow in the areas of expertise. There's several individuals, who are senior NRC staff, who have on the order of 20-plus years of vendor

inspection and experience.

So I'd like to turn it over to Rich McIntyre who's the senior reactor operations engineer in my branch, and he'll talk about recent inspection findings and trends.

MR. MCINTYRE: Thank you, Ed. Good morning, Mr. Chairman and Members. As Ed mentioned, I'm Rich McIntyre and I'm a senior reactor engineer in the Construction Mechanical Vendor Branch, and I'm one of those guys who have over 25 years.

I've been at the NRC 28 years and I've led inspection activities in the Office of Inspection and Enforcement, the Office of NRR and the Office of New Reactors. My background is in civil structural engineering, and I previously worked at ITT Grinnell in Providence, Rhode Island, for eight years.

I'm the NRC representative on several industry standards committees such as the ASME NQA-1 Executive and Standards Committees, the ASME Section III Committee on Nuclear Certification, and I am presently the chair of the ASME Section III Subgroup on General Requirements. Next slide.

Today I'm going to describe how we identify our vendors for inspection, what is the emphasis for the vendor inspectors, and then describe

some of the key inspection results.

Currently some of the NRC resources for vendor information that we use to identify vendors for inspection include the reporting systems of 10 CFR Part 21; 50.72 for the notification requirements for operating reactors; 50.73, which is the licensee event report system.

We also maintain a significant interaction with industry and standard committee organization such as NUPIC, which is the Nuclear Procurement Issues Committee. That's the licensees' auditing suppliers. The NIAC, Nuclear Industry Assessment Committee, which is the vendors' auditing each other, and the ASME Section III Nuclear Certification Survey Process.

We maintain formal and informal communications with licensees, applicants and engineering procurement and construction EPC contractors for new reactors, and we continue to have allegations that often require us to perform vendor inspections.

Some vendor initiatives that are under development include a Regulatory Issue Summary requesting voluntary identification of all safety related suppliers. We're developing an NRC public website which will allow voluntary entry of vendor

information. We're awaiting OMB clearance on that to get that started.

And we have an internal database to facilitate communication with suppliers. Ed mentioned that earlier, and we use that as a big part of our process for vendor selection. And for anybody who's gone on the Quality Assurance website, we have a link, the Quality Assurance for New Reactors has extensive information related to vendor inspection, our procedures, our results, our findings and our interactions with all of the industry organizations. So we try to maintain that very extensive so people will have a good understanding of what we're doing in the inspection process.

Vendor inspections are currently being performed for new and operating reactors and include inspections at both domestic and international vendors, as Ed talked about earlier. Most of the international inspections include observers from foreign regulatory agencies as part of the Multinational Design Evaluation Programme, which is called MDEP. And Rick Rasmussen will provide additional details related to that program in his presentation on international engagement.

And as far as our inspections go, we

include an emphasis on inspection of in-process design, fabrication, testing and inspection of specific components and product lines of interest. We use a vertical-slice approach as opposed to a broad programmatic review, often selecting a specific component and going from beginning to end on that component and basically tying in all of the 18 criteria.

We have an increased use of technical specialists in the areas of mechanical, materials, structural, electrical and digital I&C, going to what the questions you said. So we're doing quite a bit of the digital I&C, the new platforms for the AP1000 in all of the new plants.

We have an emphasis on the qualification and type testing and design work associated with targeted ITAACs, and Ed mentioned the ITAAC inspections, and Jim Beardsley.

And during our inspections we review general ITAACs for say heavy components just such as, was the component designed and fabricated in accordance with ASME Section III code, to more specific ITAAC activities as reviewing pertinent tests identified in Section III code such as valve hydrostatic tests. So we take it right down to the

component level, and also the ASME QME-1, Qualification in Mechanical Equipment.

And as Ed mentioned, we continue to increase our inspection activity, and we projected 30 for 2013.

VICE CHAIR STETKAR: Rich?

MR. MCINTYRE: Yes.

VICE CHAIR STETKAR: I wasn't at the Subcommittee meeting. And the second bullet, you know, I understand the notion of taking a vertical slice so you can drill down into, you know, the details. How do you make your selections? Are they just sort of random?

You go into a manufacturer and say, okay, I want to look at, you know, you're producing a range of, I don't know, valves, and I'm going to drill down on this particular valve, or is there a --

MR. MCINTYRE: Well, for new reactor construction it's very easy. It's not a sample. We already know valves and we're targeting valves that we want to look at the ITAACs. So like, you know, a nozzle flow check valve that we looked at Intertech. We knew they were doing qualification testing. But if it's not a specific ITAAC, we use a smart sample.

VICE CHAIR STETKAR: But I mean do you

look at all of the, every ITAAC component? I mean that's a lot of stuff.

(Crosstalk)

MR. MCINTYRE: No. The specific ITAAC's related to a component, so we will try to identify the specific component ITAACs that we can at the vendor facility but obviously there's going to be many that have to be followed up once they're installed. But we look at the ones that we can during fabrication.

MR. RASMUSSEN: Yes, I would just like to point out our initial planning, and I think we've been successful with this so far, is to observe every vendor that's doing ITAAC qualification work, every example of that vendor doing the types of qualification work that they do.

So if a vendor is commonly doing a lot of seismic testing, we go out and we see their seismic testing of the best sample we can get. We see basically one week worth of sample even though they're doing months and months of qualification testing.

But we've tried to at least cover the map so that with some reasonable assurance we can say that we've seen these vendors performing all of the various qualification tests that are associated with the ITAAC.

VICE CHAIR STETKAR: Okay.

MEMBER SCHULTZ: You also began to talk about a smart look approach?

MR. MCINTYRE: Yes, what I was going to say there is if we go into a supplier and say they're not providing AP1000 new reactor components, we'll ask for a selection of purchase orders, recent purchase orders from vendors, I mean from licensees, and then again we'll take that in. So we're going to be looking at a component that we know that a licensee is currently procuring.

CHAIR ARMIJO: Or something unique like a giant squib valve or --

MR. MCINTYRE: Exactly. Without a doubt.

MR. RASMUSSEN: And I think that's our current success story.

(Crosstalk)

MR. RASMUSSEN: We certainly looked at the squib valves extensively. So far we have a number of issues associated with the firing circuits. On a proactive level we've got the licensees, Westinghouse and the designers coming into a meeting two weeks from now to talk about those issues. So I think identifying those safety-significant issues early is one of our benefits.

MR. MCINTYRE: Marlayna, the next slide, please. As you can see, this slide identifies the Appendix B finding criteria from all the inspections that we completed in fiscal year 2012. That represents a total findings of Notices of Violation and Notices of Nonconformance that were cited against licensees, applicants or vendors.

A large percentage of the vendor inspections, probably close to 75, 80 percent have been related to the AP1000 design, fabrication and testing activities. An NOV is cited for failure to meet 10 CFR Part 21 requirements for evaluating and reporting of defects, and NON is for failure to implement the specific Appendix B QA requirements, and about seven percent of the findings were related to Part 21.

As you can see, the most significant amount of findings were written for failure to implement or follow the Appendix B criteria that I'll go through. And these findings were all consistent with the scope of our inspections over the past year that were focused more on design control and mechanical and electrical equipment qualification testing activities.

As you can see on the pie chart, the

highest percentage of findings were against, first, was design control and that's including the dedication of commercial-grade items which is a big issue, and I'll talk a little bit about that later.

And of that percentage of the Criterion 3, about 68 percent of those were specific to commercial-grade item dedication. Two was corrective actions. Three was test control, and with doing a number of these AP1000 test inspections as Rick was talking about. And then Number 4 was Criterion 7 for control of purchase material, equipment and services, which is essentially our review of supply or oversight.

And we had a question during the previous briefing about what we have done in identifying the safety significance for dedication issues, and in 2011, February 2011, we issued information Notice 2011-01, and that described commercial-grade dedication issues identified during recent vendor inspections.

So we realize that it's an issue and we got the information notice on the street to try, two years ago, to bring licensees and supplies, let them know that these are areas of concern with us.

Next slide I'm going to talk about some of the typical inspection findings identified. First,

Part 21, failure to comply for the evaluation, identification and reporting of defects, and noncompliance, and that includes inadequate technical evaluations that support the Part 21 conclusions.

Failure to provide appropriate oversight of subcontractors. Unfortunately in new reactors this is something we've been seeing more and more. And as we know, subcontractors must implement their Part 50 Appendix B quality assurance requirements for their scope of supply. General failure to develop and implement procedures for all their safety-related activities.

Commercial-grade dedication. As we've talked about it's an Appendix B activity in many cases. Commercial-grade items were not adequately dedicated for their safety-related application as required by Criterion 3 Design control and Criterion 7 requirements.

Specific design control or failure to meet design requirements as meeting the design specification and following the design drawing requirements. Test control findings such as making changes to a component undergoing testing without an adequate supporting technical basis. And measuring and test equipment being used outside of the

calibrated range.

MEMBER SKILLMAN: Let's just talk about that second bullet for a second. Is that bullet pointed specifically at Summer and Vogtle for their failure to hold their subcontractors accountable to 10 CFR 50 Appendix B, or is that more aimed at the subcontractors for Vogtle and Summer failing to hold their subcontractors accountable to 10 CFR 50 Appendix B?

MR. ROACH: I would say it's the latter. What we've identified is they take the procurement documentation, implement it at their facility and then farm out various pieces without doing the requisite surveys, audits.

MEMBER SKILLMAN: And they is whom?

MR. ROACH: They would be the actual vendor who receives the order for the manufacturing of a component for Summer or Vogtle.

MEMBER SKILLMAN: Yes, okay. Now let me ask one more question. Is that an issue of capability of those subcontractors or is that an issue of resource level? Is the message that this bullet is communicating that the subcontractors just don't have the moxie or the talent to do it or is it because they don't have the resources to do it?

MR. LUEHMAN: I think it's a third reason. I think a lot of it, and what we're finding is that we have in many of these areas we have a lot of new entrants into the supply chain. And in many cases we find they do have the technical capabilities, they have the financial resources, but they are not fully aware of playing in Appendix B.

So a lot of it is just an education level. I think that coming up here in another month or so when we have the RIC, we're going to have a panel on vendor oversight, and on that panel we're going to have a couple of the major vendors.

And one of the things that you're going to hear, would hear in their presentations is the challenges they have as they move down the supply chain and as they have to get various smaller and subcomponents from specialized manufacturers, is getting the nuclear culture and understanding of all the requirements of Appendix B and all the associated technical standards sort of indoctrinated and inculcated into those organizations.

So are there occasions where, yes, you have somebody that's not really technically qualified? The answer is yes. But by and large, right now we've found with a lot of the sub-tier vendors it's a matter

of education and experience that they lack.

MEMBER SKILLMAN: It almost sounds like a lesson that we learned in the procurement initiative 20 years ago coming back to life.

(Crosstalk)

MEMBER SKILLMAN: Thank you, guys. My comment was really aimed to be pejorative towards the two builders. I was just curious, what is this telling us?

MR. MCINTYRE: A comment that our staff always makes when we go to meetings such as NUPIC or ASME conferences, that you have to know the capabilities of your suppliers. So to get just what Jim's getting at, you have to really know how good they are. We have so many new suppliers and you have to do a real in-depth audit when you go into these suppliers.

MEMBER SKILLMAN: Okay, thank you. Thank you.

CHAIR ARMIJO: Well, generally, don't they have to qualify their suppliers, or are they --

MR. MCINTYRE: That's what I'm talking about, yes.

CHAIR ARMIJO: Oh, okay.

MR. MCINTYRE: Yes, so during that

qualification process you've got to go in and do a real in-depth review of their technical capabilities so we don't get into the scenario like with the squib valves.

MEMBER SKILLMAN: Yes, thank you.

MR. MCINTYRE: And last slide in closing, we wanted to identify areas of concern that we will concentrate on during our vendor inspections in 2013.

We plan to continue to inspect for weaknesses such as inadequate design control and commercial-grade dedication; inadequate dedication of commercial software and computer programs; inadequate technical evaluations of conditions adverse to quality as part of the corrective action process; inadequate justification for substitutions in materials of construction for both mechanical and electrical type equipment.

And as we move forward, under challenges and trends you see commercial-grade dedication is first up. Dedication is now a widely used process in the nuclear industry. However, not all suppliers exhibit a basic understanding of or are implementing sound dedication practices including sub-supplier qualification and adequate technical evaluations for identifying safety functions and critical

characteristics.

We've identified dedication as an area for inspection emphasis for both our new reactor components and testing activities and for operating reactor replacement parts. And that concludes my presentation, and Rick will now discuss international engagement.

MR. RASMUSSEN: My name is Richard Rasmussen. I'm the chief of the Electrical Vendor Inspection Branch in the Office of New Reactors. And just as some background, I have about 20 years with the NRC and 28 years nuclear, so I've seen a couple of things.

I'm going to tell you about the international engagements we have under the Multi-National Design Evaluation Programme Vendor Inspection Cooperating Working Group. So a pretty good title there.

This working group currently has 12 member countries. We meet a couple times a year face-to-face, typically in Paris, to work on our plans and the implementation items that I'm going to talk about. And I've been the NRC rep for about three years now. Next slide.

So I'm going to tell you about our working

group objectives, some of our inspection activities that we've undertaken and where we're going with the concept of some multi-national inspections. So the objectives, the three main ones, facilitating, understanding and sharing to conduct joint activities, and then the Holy Grail of trying to harmonize, Quality Assurance requirements.

(Crosstalk)

MR. RASMUSSEN: The first one, we've taken an effort now over a number of years as a working group to actually understand each other's programs. It's really a mix of laws, technical requirements that the different countries have, customs come into play with some of the countries. And at 50,000 feet, all the countries have very similar goals from quality assurance, and it's as you drill down that things start to diverge and get snaky.

And so one of the keys to success of this working group is finding the right level where you can have meaningful results to all the member countries and not get bogged down into individual implementation steps, and I think we're having some success with that.

Towards our goal of facilitating these joint and multi-national inspections we've developed

a protocol document. It outlines our rules of engagement, how we coordinate with each other, how we interact when we're on inspections with other countries, and that's been very helpful.

It's a public document. If we have a vendor that we're engaging with an international team we provide them this document and it lays out what we're doing and kind of sets them at ease a little bit. Because it's bad enough when the NRC shows up, and then we show up with another country too, it intimidates some.

We have a platform for sharing information, the inspection results that we have and also documenting feedback that the member countries give us. And then I'll get to the harmonization on another slide.

So within our protocol document we really have three types that are currently described. We have a witnessed inspection which was kind of our first step. It's very much like it sounds. One country NRC conducts an inspection, other countries come and observe.

They don't really have a role. The regulators, they follow us around, they'll ask questions of us. But it's on a very non-intrusive

basis with the vendor that we're inspecting.

VICE CHAIR STETKAR: Rich, again I wasn't at Subcommittee meeting and I've forgotten. In your introduction you mentioned kind of somewhere between five and ten members. What specific countries are participating in this --

MR. RASMUSSEN: Sure, there's 12 countries.

VICE CHAIR STETKAR: Twelve, okay.

MR. RASMUSSEN: So it's the U.S., Korea, the U.K., the Russian Federation, China, Finland, France, Canada, Japan, South Africa, and then we have two new members which is India and the UAE.

VICE CHAIR STETKAR: Okay, good. Thanks.

MR. RASMUSSEN: With the joint inspections, these inspections are led by one country and then we use members from another country on the inspection team very much like we would use a technical specialist within our own organization, a contracted inspector.

Sometimes we go to national labs and get tech specialists that support us on inspections. And so these folks play an inspection role, they provide input to our inspection reports. They're just part of the team.

The next step that we might get to is what's called a multi-national inspection, and the details on that are a little sketchy because we've never done one and we're still working on all the decision points. But it will involve members of multiple countries inspecting at perhaps a slightly higher level to a common set of QA requirements or concepts even, if you will.

These would most likely be useful to provide a basic understanding of a vendor's activities but maybe not details as much as we would want for some of our considerations. But it would be a good basis for us to help prioritize our list of 100 international vendors, say, use one of these teams to at least get a snapshot of them, decide if that's where we want to spend our international travel dollars to go back, because we would only be sending one maybe two people at most.

And so we're looking to see what kind of efficiencies we can gain through these kind of interactions. A level of activity that we're doing, 2007 and '12 were very similar.

CHAIR ARMIJO: Richard, just quick. On witnessed inspections, are there situations where another country is a lead on an inspection and we're

the witnesses?

MR. RASMUSSEN: Yes.

CHAIR ARMIJO: Okay, so it goes both ways.

MR. RASMUSSEN: It's gone both ways. And we've done, we do a lot with the Koreans because we have very similar regulatory structures. A lot with the Canadians, French. Some with Finland. Some with China, mainly them looking at us, I think, is -- there's been a lot of other bilateral activity in China, but not so much directly attributable to this program.

VICE CHAIR STETKAR: Richard, on the joint inspections, I understand the witness inspections because there's a lead team and they're inspecting according to, you know, your particular requirements. On the joint inspections you mentioned that each inspector serves as a technical expert.

Are they performing the inspections according to their country's specific criteria so that, you know, this inspection doesn't necessarily have the same criteria applied?

MR. RASMUSSEN: Well, the way we play this out on a joint inspection, the lead country, and so far we've led and Korea has led. The lead country develops the inspection plan.

VICE CHAIR STETKAR: Okay.

MR. RASMUSSEN: We try to make the assignments in areas that would be familiar with those countries, and of our 18 criteria some overlap better with some countries than others.

VICE CHAIR STETKAR: Okay.

MR. RASMUSSEN: And so we would try to make appropriate, you know, best-fit assignments for those teams. But they actually, the intent is that they inspect to the lead country's requirements, and the lead country --

VICE CHAIR STETKAR: That helped.

MR. RASMUSSEN: Yes. The lead country really has the translation role of taking that input and then forming it into something that can be specifically perhaps adjudicated in Notice of Nonconformance or something.

MEMBER RYAN: I'm just curious, Richard. Have you run into circumstances where the differences are significant and it's hard to come to some common plan?

MR. RASMUSSEN: So far the ones that we've attempted have all worked well. Again they've been between U.S. and Korea so we share that structure.

MS. KAVANAUGH: I can help. We

participated in a joint, or a Korean-led inspection at Doosan last year. Is it last year? 2011. It would have been 2011.

Since KINS was leading the inspection they were looking at their components and not necessarily the U.S. components. However, all the documentation for the Korean components was in Korean, and the U.S. members, myself included, are not very good at reading Korean.

So as an alternative we did our role as that part of the inspection, but looking at the AP1000 plants and those documentations as a feeder into their inspection. So we're looking at the process using our components.

MEMBER RYAN: Thank you.

MR. RASMUSSEN: And I think, you know, some of the things, the Koreans, their protocols are a little different than ours. They will write findings and then they also provide suggestions and areas for improvement and areas that they did well, as I recall.

And so it was a little different for our inspectors to provide that kind of input when we've told them to stop providing that kind of input. But that's one of the accommodations that we have to make.

MEMBER SKILLMAN: Let me ask this. Several of the countries that you identified have built a Quality Assurance program that's very similar to our Appendix B to 10 CFR 50. Other countries have their own quality assurance standards that in some cases exceed the requirements that our 10 CFR 50 Appendix B has.

Have you run into friction where some of the members would suggest that our 10 CFR 50 Appendix B is deficient and needs to be strengthened?

MR. RASMUSSEN: Well, there's the French. You do get that a little bit, and in those areas like in cases with the French we've dealt with some issues down at the actual metallurgy level trying to assess flaws in piping.

We default to our fundamentals of the ASME code. They use their standards. But we've actually had very healthy discussions about why it would be okay with us, why they're questioning it, doing those kind of technical evaluations.

In terms of this program and actually doing an inspection with a joint outcome, I think in those countries we just have to agree to stay at a higher level where we can agree on the facts and not go so deep that it bogs us down. But we are

developing an understanding of where those are.

MEMBER SKILLMAN: Thank you.

MR. RASMUSSEN: It's, you know, it is a work in progress and we are evolving.

MEMBER BROWN: Let me ask a question to that. Does that, they've got, they inspect to their process. If we've got parts or a heavy component of some type from a foreign vendor, I presume we don't accede to their, use the French as an example, to their material standard or whatever. We use ours, right? I mean they build to ours?

MR. RASMUSSEN: Yes.

MEMBER BROWN: Okay, I just wanted to make sure I understood that, that's all.

MR. RASMUSSEN: Yes. And a lot of the foreign vendors are trying to assemble programs, because they deal on a multi-national market, assemble programs that meet all the standards simultaneously even, and that's a challenge that the vendors face.

CHAIR ARMIJO: We'd probably better keep moving.

MR. RASMUSSEN: Okay, go to the next slide. Some of our recent experience, the KINS inspection that Kerri mentioned at Doosan Heavy Industries, and then in 2012 we led an inspection at

Target Rock. We had two KINS team members on the team with us.

The benefits that we're seeing is reduction in resources for the two countries. We get a lot of expertise. There's really good people in these other countries' organizations and we get access to them. We get access to engineers, regulators, and native language all in one package, so that can be very beneficial.

And it also lessens the impact of vendors to some extent, because when a joint inspection team comes in they're getting looked at by two countries at once and it's one less week for them. We've got another one being planned right now, Qual Tech. I don't think it's March anymore. I think it's been pushed back until April.

And also this year, recently we observed a Canadian-led kind of an engineering design verification type inspection of Westinghouse and we got a few insights from that. So things are ongoing.

The multi-national inspections. I guess I've talked about a number of these aspects. One of the things to help facilitate this, we're getting some dialogue going with the basic, with the standards development organizations, the folks from ISO, ASME,

GSR, trying to determine if there's areas that we could converge at least maybe in the guidance and implementation of these standards, and try to make things easier for the vendors that are trying to comply with all of these, and for the inspectors, to make us a little more harmonized.

So those talks are early on. Folks seem to be a little bit open to it. You know, do I think I'm going to change Appendix B? I really don't think so, so we'll see how far we can go with this. So that's all I had.

CHAIR ARMIJO: Okay, thank you. Kerri?

MS. KAVANAUGH: All right. I know we're on a time constraint so I will go fast, but I'm the one with the pictures.

CHAIR ARMIJO: Yes. That's what I wanted to get to.

MS. KAVANAUGH: My name is Kerri Kavanaugh. I'm the chief of the Quality Assurance Branch. I've been with the NRC going on 21 years. My background is in reactor systems, plant systems, tech specs, and the vendor inspections.

I also serve as one of the agency's representatives on several ASME Section III committees, the Board of Conformity Assessment and

NQA-1 subcommittees. Prior to my current position I've served as the team leader for many of these inspections that we're going to highlight today.

And I just want to make sure that we're aware. We had some discussions earlier about other types of inspections. My presentation is just only on the large component inspections that we've done. Next slide.

The purpose of my presentation is to highlight the NRO DCIP standard inspection activities at a variety of large component manufacturers both foreign and domestic.

NRO DCIP has been conducting technically focused and programmatic vendor inspections since the Office of New Reactors stood up in 2007. The vendor inspection teams consist of both vendor inspectors and technical specialists from NRO or the Regions or specifically Region II.

During the vendor inspections the inspectors conduct observations of the manufacturing process including special processes such as non-destructive examinations, welding, and in some cases, forging. The inspectors also conduct a thorough records review of the components being inspected.

The vendor inspection branches have

performed two inspections at Babcock & Wilcox facilities. In 2007, NRR staff performed an inspection of the Palisades replacement reactor vessel head at the B&W-Canada, our facility in Ontario, Canada. 2008, NRO staff conducted an inspection of the replacement reactor vessel heads for Diablo Canyon at the B&W facility in Mount Vernon, Indiana.

NRO DCIP has conducted two inspections at Mitsubishi Heavy Industries in Kobe, Japan. In 2008, a vendor inspection evaluated MHI's manufacturing process for reactor vessels, steam generators, and for the other reactor internals. The picture on the left is a replacement steam generator for a U.S. operating plant.

In the picture on the right, NRO vendor inspectors are evaluating the NDE indications on the steam generator nozzle. In 2012, a reactor vendor inspection was conducted at MHI to evaluate the SONGS tube-wear issues.

MEMBER POWERS: The question is those pictures always elicit --

MS. KAVANAUGH: I'm sorry?

MEMBER POWERS: The question that always comes to mind when I look at that picture is, will our current inspection capabilities catch the dwell vessel

problem or the AREVA steam generator problem?

MS. KAVANAUGH: Well, as part of our inspection selection for the different vendors we take in operating experience as part of one of the criteria. As for the dwell problem, I mean it's a timing. It's definitely a timing. We look at the records associated with the components that we're inspecting. Whether or not we would catch it, you know, I think it's a matter of luck whether we're there and looking at the records at the right time.

MEMBER POWERS: Well, certainly for dwell, what we had was a case of good records for a couple of the rings, and somewhat marginal records for a couple more rings. And what I'm wondering is, suppose we're looking at those post-forging records and you found good records for a couple of rings, and then records that probably were described as, then we did it the same way for the others. How do you react to those when you're doing the inspection?

MS. KAVANAUGH: Well, you actually have to look at the requirements that they have to meet, and if the requirements and the documentation doesn't meet the requirements then you start pulling the string and looking at broader sample size. It really depends on the inspectors' skills and the team leader's skills

that are on the inspection and their capabilities of making sure that they understand what that means in the big picture.

Hopefully we have our inspectors ready for the inspection such that they understand the operating experience that is out there so that they can identify where this may be an issue.

MEMBER POWERS: I think I agree with you in what you've said in that it really depends on tenacity or the determination in this particular case.

MS. KAVANAUGH: Right.

MEMBER POWERS: Because I think you could get snowed at every stage in the process. Now if you start pulling the string and you came up short they'd say, well, we've been doing this since Northrop Industries was started and we know what we're doing and we just did it that way.

MS. KAVANAUGH: Right.

MEMBER POWERS: Yes, well, they didn't.

(Crosstalk)

MR. RASMUSSEN: I would argue that's a common element to all inspections.

MEMBER POWERS: Yes, I think so.

MR. RASMUSSEN: Entirely dependent on the skill and training of our folks.

MEMBER POWERS: So you have to hire a bunch of people that really have bad personalities.

MS. KAVANAUGH: They are definitely mean-spirited.

MEMBER POWERS: Suspicious.

(Crosstalk)

CHAIR ARMIJO: Okay --

MEMBER POWERS: As we look at your requirement records we think we may have some candidates for membership here.

MS. KAVANAUGH: Next slide. The Vendor Inspection Branches have performed two inspections at Doosan Heavy Industries in Changwon, South Korea. Prior to 2009, Doosan manufactured reactor pressure vessels, steam generators, and reactor internals for operating reactors in AP1000 reactors using forgings from Japan's Steel Works.

In 2009, Doosan began pouring their own forgings. During the 2009 inspection, the inspection team witnessed the pouring of the AP1000 reactor vessel upper shell for the V.C. Summer site.

In the picture on the left, the NRC inspectors are evaluating reactor head J-groove weld inspections. In the picture on the right, the NRC inspection team is joined by representatives of

Doosan, the Korean regulator KINS, Westinghouse, Souther Nuclear, and SCANA in front of a steam generator destined for the Vogtle site.

NRO DCIP conducted an inspection at Japan's Steel Works in Muroran, Japan on the island of Hokkaido. JSW has a 14,000 ton press in operation and can produce a single ingot of 600 tons. JSW manufactures large steel forgings and castings for reactor pressure vessels, heads, and steam generators for all reactor designs for new and operating facilities.

During the inspection, the team observed non-destructive examinations of the South Texas Project Unit 3 and 4, an ABWR design, reactor pressure vessel bottom head dome and bottom head ring. In the pictures, the inspectors are reviewing NDE indications with the JSW authorized nuclear inspector on the steam generator bottom forgings.

The inspection report for the JSW inspection is available in ADAMS and on our NRC Quality Assurance Public Web site along with all the NRO vendor inspection reports and quality inspection reports.

NRO DCIP conducted an inspection of Creusot Forge in Le Creusot, France. Creusot Forge

manufactures reactor pressure vessel and steam generator forgings for EPRs. Creusot Forge also manufactured the reactor coolant piping for EPRs in Finland and France.

During the Creusot Forge inspection, the inspectors verified manufacturing activities such as non-destructive examinations and machining operations for a U.S. EPR reactor pressure lower head, EPR steam generator lower shell, EPR reactor pressure vessel upper head, and U.S. EPR steam generator upper shell.

Sumitomo, there are there three manufacturers of steam generated tubing in the world. NRO DCIP performed an inspection at Sumitomo Metal Industries in Yokohama, Japan. Sumitomo manufactures the steam generator tubing for AP1000 in U.S. operating reactors.

Sandvik Material Technology in Sanviken, Sweden is also a manufacturer of steam generator tubing for the EPR in U.S. operating reactors. NRO DCIP conducted an inspection of Sandvik in 2010 focusing on the manufacturing process and related records. In this picture the NRC inspection team is in front of a steam generator bundle that was being prepped for shipping.

NRO DCIP has conducted two inspections at

two locations at Mangiarotti SPA in Italy. in 2010 a vendor inspection evaluated Mangiarotti's manufacturing process for AP1000 pressurizers and passive residual heat removal exchangers. In 2012 a vendor inspection evaluated the manufacturing process for AP1000 chord makeup tanks and the cumulatives.

In 2010, NRO DCIP conducted a vendor inspection at IHI Corporation in Yokohama, Japan. The inspection team evaluated the manufacturing process for the South Texas ABWR reactor pressure vessel and the AP1000 containment vessel, which is currently being assembled at Vogtle.

In the picture on the left is the STP reactor pressure vessel head. The picture on the right is the NRC inspectors standing next to a personnel hatch. These pictures show the rolling of the AP1000 containment vessels. The inspection report for IHI inspection is available in ADAMS and on our NRC QA Web site.

NRO DCIP performed a vendor inspection at Westinghouse Newington in Newington, New Hampshire. Westinghouse Newington manufactures AP1000 control rod drive mechanisms and reactor vessel internals. In this picture members of an amped up vendor inspection team is standing in front of an AP1000 core shroud,

which is on the left. And the APR-1400 core shroud, which is on the right, and is the Korean design.

Last but not least, NRO DCIP conducted a vendor inspection in SPX Copes-Vulcan in Erie, PA. SPX is responsible for the design and manufacture of the AP1000 squib valves as shown in the picture. This concludes my portion of the presentation.

CHAIR ARMIJO: You actually witnessed some testing also, didn't you, of the squib valve?

MS. KAVANAUGH: Our teams have witnessed a variety of different testing for the squib valves, both EQ and seismic at this point.

MR. RASMUSSEN: EQ, seismic, and also of the actuator assemblies, the explosives.

CHAIR ARMIJO: So an actual, or just the subcomponent package.

MR. RASMUSSEN: Just the subcomponent so far.

CHAIR ARMIJO: Yes, but not the actual valve --

MR. RASMUSSEN: Right.

MS. KAVANAUGH: Well I don't think they've gotten to that point to do that demonstration.

MR. RASMUSSEN: Yes, we're selling tickets but --

CHAIR ARMIJO: Take pictures.

MR. ROACH: This is Ed Roach, we did, when we visited SPX for our inspection, they did have a video of some of their early prototypes of the SPX, I think it was the 14 inch squib valve testing, and they did do the full operations with the section of pipe that was pressurized to about 200 pounds. And they shot water over 100 feet when they did shear. And they had a video of that but that was proprietary and they wouldn't let us have a copy.

CHAIR ARMIJO: Good. Okay.

MEMBER BROWN: Can I ask a question?

CHAIR ARMIJO: Go ahead, yes.

MEMBER BROWN: All right, in all these inspections, joint inspections of the Quality Assurance Programs, were there every any violations or defects noted or non-conformances found?

MS. KAVANAUGH: Do you want me to go over all that?

MEMBER BROWN: Well, I'm just asking if you all did, that's all.

MS. KAVANAUGH: Yes.

MEMBER BROWN: Okay.

MS. KAVANAUGH: I have a whole listing if you'd like.

MEMBER BROWN: No, I'm just curious. I mean, I didn't expect you to, I just, that was a yes or no questions.

MS. KAVANAUGH: Yes.

MEMBER BROWN: And I presume that the interchange, I mean some of these with the foreign manufacturers, how did that interchange work out in terms of resolution? I mean, were they --

MS. KAVANAUGH: Actually, they're actually much more responsive than our domestic suppliers.

MEMBER BROWN: Is that right?

MS. KAVANAUGH: Yes.

MEMBER BROWN: Very interesting.

MS. KAVANAUGH: We generally do not have too much of an issue.

MEMBER BROWN: They want to be in the market then. Okay. Okay, thank you.

MS. KAVANAUGH: You're welcome.

MR. LUEHMAN: Just to follow up on your earlier question about the segregation or isolation of the software platforms?

MEMBER BROWN: Yes, for development of software, not the platforms, right.

MR. LUEHMAN: Well yes, but I mean the isolation of the platform that it's being built on.

MEMBER BROWN: Oh, okay, yes, got it, got it.

MR. LUEHMAN: And we did verify with some of our inspection team members that yes, we do in fact verify that.

MEMBER BROWN: Okay, good.

CHAIR ARMIJO: Anyone, any other questions? I had a question, it's a follow up from the subcommittee meeting and Dr. Powers brought up the question of a mechanism for assessing the adequacy of the NRC's vendor inspection program. You know, either benchmarking with programs that maybe other countries have, some metrics that you might say we're doing enough or we're not doing enough, or we're overdoing it. Is there, and the question was asked, have you thought about that and do you think you're about right or --

MR. LUEHMAN: We did some homework on that and Ed Roach is going to answer.

CHAIR ARMIJO: Oh, okay.

MR. LUEHMAN: Yes, Ed's back here.

CHAIR ARMIJO: I'm glad Dana's back, I thought he didn't --

MR. LUEHMAN: Yes.

MR. ROACH: I think in one of our --

MEMBER POWERS: Just following up, I just requested the inspection reports from Creusot Forge.

MS. KAVANAUGH: They're available on our Web site.

MEMBER POWERS: We're going to get them.

MS. KAVANAUGH: Yes, sir.

MEMBER POWERS: We're going to take you, Kerri.

CHAIR ARMIJO: Dana, I raised the question since you weren't here about this point you brought up about the, assessing the adequacy of the vendor inspection program that the NRC has, whether it's adequate or not, whether it needs to be increased, or whether it's overdoing it, you know, how do you measure that?

MR. ROACH: And I think, following the subcommittee meeting, we did sit down and I think we took an initiative to evaluate how best to establish a metric that could possibly measure this and give us feedback. We don't have something that's quantifiable yet, however we do benchmark other entities to inspect based on our experience with NUPIC, the international community, as well as, it's quite common for us on our inspections to pull the licensees, or the higher tier vendors inspection and audit reports to see exactly

what they've looked at, to see if they're getting to it or they're just doing pro forma.

So there's several ways we are trying to inform our program to make it better. Our vendor inspection program performance plan has metrics, and sometimes the best thing you can say is you are what you measure. And what we're trying to do is steer those metrics, that our inspections add value.

And part of that is to get us to where we get feedback from the actual vendors and the licensees on it. And you know, we may not like what we hear sometimes, but we also expect to get that feedback in a transparent environment so that we can take action to improve it.

Our indicators also measure and perform an annual assessment of the notices of violations and notices of non-conformances so that we can see whether or not, you know, we're losing our effectiveness, we've lost our edge, and we're actually, you know, if we're finding more significant items we would again, escalate those to our management within the NRC so that they can, if we need additional resources we would expect to identify that.

MR. LUEHMAN: Mr. Chairman, the biggest thing I think that we've, and of course obviously at

this point it's all anecdotal, but the one thing that we have heard back in feedback from vendors is, as compared to the past is that in the past, I think that their view of some of our inspections were that they were very programmatically based paperwork exercises. I mean, that's my words not theirs, but I think that, you know, that we came in and looked at the general program and the state of the program.

I think that the feedback that we've gotten in the past few years from those vendors that wanted to give us feedback has been much more along the line of that they were surprised at the technical depth that we've gone into. I think that the addition of technical specialists, of routinely using a technical specialist either from the region or from our technical divisions has been a real plus.

And where those people weren't available, that we at least had the benefit of their expertise in the preparation of the inspection plan and their availability on the phone when we went and did the inspection, so if they didn't go along that they told us what some things that they thought we needed to look for in a specific case. And then obviously if we had questions based on what we found, that we got back to them.

So anecdotally, I think that what we've gotten back from the vendors that we've inspected is that they've seen the change in emphasis over the last ten years or so from the much more higher level programmatic based vendor inspections to more technically focused.

And I think as we used in one of the slides, a vertical slice, looking at a specific component and looking at the 18 criteria through the lens of that component rather than just looking at their paper program and seeing if they have all the words to the, the right words to meet the 18 criteria.

Having said that, we do think the program's important because, and one of the things that we do when we find a problem on the floor is we will examine well, okay, this procedure, we'll examine how the person's doing it. He appears to be doing it correctly. Is that because he's experienced or is that because he's been trained well?

And sometimes it's great if you're experienced, but if you leave, if tomorrow another guy is doing that very same job, if he doesn't have the benefit of a good procedure and he's not as experienced as the person, because we again only do sampling, that was there yesterday, and they don't

have an adequate procedure, then you're probably not going to get the same quality of product the very next day.

So I think anecdotally, the information we've gotten from the vendors is that our focus has moved the right direction. As Ed said, I think that we were asked a very difficult question I mean, and coming up with, are there quantitative criteria we can measure this against? We're going to look at that, but we do think that there are some qualitative criteria including benchmarking with the other organizations both domestically and internationally to do this kind of work.

CHAIR ARMIJO: Yes, well I was thinking of following up on Dana's question after the subcommittee meeting. I was thinking, how would I look for data? And some things you can measure are just the number of inspections or the size of your inspection group compared to the number of components, let's say reactors that are being built, compare yourself to the French. Do they have armies where you have, you know, companies? Are we about right around the world, are we understaffed or underfunded?

MR. RASMUSSEN: Yes, from the international perspective, two pieces of feedback

really. For the folks that have observed or participated in our inspections, everyone tells us they're impressed with our inspectors, the training, the level of expertise that they have and the depth that they probe, no questions there, they're top-notch.

However, NRC and its intrusiveness, there's a pretty wide gambut out there, from regulators that actually license the vendors, so they're in direct control of them. You've got countries like Finland that go out and establish hold points for key operations at vendor sites, so the regulator must and will be there. That's certainly a level of intrusiveness beyond us.

There's other examples like the French who operate almost like an ASME/ANI and inspect and stamp the heavy components. And so there's all those different categories. So in regulatory impact, we are far from the top but not the bottom.

MEMBER RYAN: Are there any unannounced inspections?

MR. RASMUSSEN: Yes. The majority are announced, but for cause we can do unannounced and have, even recently.

MEMBER RYAN: For cause, but not as a

routine.

MEMBER RAY: Well the biggest problem --

MR. RASMUSSEN: Right. It's not typically efficient to do it as a routine, a lot of reasons not to do that.

MEMBER RYAN: Yes, okay.

MEMBER RAY: The discussion that's been going on here the last few minutes, though I think illustrates a problem which is, holding the licensee responsible in the first place for the quality programs of the vendors. And, you know, it's a very difficult job because they lack the expertise often the regulator has. But on the other hand, they're the ones that are, in theory at least, supposed to be responsible for these programs being effectively implemented.

And from my experience, they don't get hammered enough for the deficiencies that get identified. And the best way to do that is the old way that now is passe, and that is the effectiveness of the program, the programmatic assessment will better identify shortcomings in the licensees following up on their vendors or making sure that the vendors are doing what they should. That's the easier way for the regulator to find that the licensee isn't

doing the job than by the inspections that you've been talking about.

And, you know, my judgment is that we have become more technically focused and therefore tend to supplant what the licensees should be doing. And, so that's for what it's worth, my two cents' worth.

If we, so you get into a position where the licensees tend to back off because the regulator is being much more effective in the inspections that they're doing, but on the other hand, the regulator can't ensure that all of the vendors have the programs in place that are effectively being implemented just by sampling inspections on particular critical functions that are being performed, big forgings or weldments or radiography or whatever the case may be. It's a dilemma I think and I don't see it getting resolved because they say the licensees typically don't have the skill set.

CHAIR ARMIJO: Well, but their suppliers do, like Westinghouse would do it for Vogtle, you know?

MR. LUEHMAN: Yes, I don't want to portray that our inspection has gone, that we've gone completely away from that. I mean, I think our emphasis now is more on the technical side because of

the new, you know, the new components that are being developed, and the squib valves which we have on the screen right now being a good example, which is a new design, a new, you know, something completely different than has been used before in the plant. So obviously it does warrant a certain amount more of our resources to look at the technical aspects of that valve versus the overall programmatic.

That's not to say that we don't spend any time on the programmatic. And in fact, in those cases where we find sub-tier vendors or vendors or sub-tier vendors where we have significant problems with their program, we will engage up the chain. In fact we're considering right now, such a case. I mean we still have it under, it's still preliminary and we're still reviewing our inspection results, but we did find a, you know, we do have a sub-tier supplier where we found the program was so lacking in our judgment that we are going to raise that potentially with the supplier who certified that they were able to provide that sub-tier service or product. And so I don't think it's all or nothing. We've --

MEMBER RAY: Well, but look, the licensee procures a lot of stuff that's not provided by the NSSS supplier. And I'll just leave it at that. I

mean I think that there's a problem of being focused on just the technical aspects of the most critical evolutions. And yet you've got this enormous supply chain, not all of which goes through Westinghouse or whoever, and you need to have somebody holding accountable, the suppliers for effective implementation of programs, not just the performance of particularly critical technical functions. That's why there are 18 criteria to start with.

MR. LUEHMAN: You'll get no disagreement from me. Our key message to the industry, especially to the new-builds is that the licensee is responsible. We've heard --

MEMBER RAY: Well that's the main point I'm trying to make, yes.

MR. LUEHMAN: Well, and we've made that point to the two licensees that are presently constructed. In fact, you know, our Director, Laura Dudes, was just down at the two sites the last couple of days. And that message was made at meetings again with both of the utilities, that in the final analysis of licensees --

MEMBER RAY: Well they're hard and costly to do and so it, you know, you tend to drift away from it and like I say get into just little niches of end-

stamping or something when in fact, there's a lot more going on that needs, can only be implemented by licensees. The agency can't do it, it's just too big, too broad.

CHAIR ARMIJO: Okay, any other questions or comments by the members? Well we have a bridge line, is the bridge line open? And do we have anyone on the bridge line that would like to make a comment?

MR. BROWN: The bridge is open.

CHAIR ARMIJO: Okay, bridge is open, anyone out there that would like to make a comment? Okay, hearing no one, I think we will adjourn this session. I'd like to thank the staff for a very good presentation. And we will reconvene at 1:15 and Mr. Stetkar will open it for us.

MALE PARTICIPANT: Thank you very much.

(Whereupon, the meeting in the above-mentioned matter went off the record at 12:20 p.m. and went back on the record at 1:15 p.m.)

CHAIR ARMIJO: Okay, we're going to reconvene the session and I think Mr. Skillman is going to lead us through the presentation on Construction Reactor Oversight Process.

MEMBER SKILLMAN: So Mr. Chairman, I will proceed but we are waiting for the copies, and they

should be here momentarily.

CHAIR ARMIJO: In the meantime --

MEMBER SKILLMAN: Let's go ahead.

CHAIR ARMIJO: -- we've got them on the screen.

MEMBER SKILLMAN: Okay, Mr. Chairman, the purpose of this session is to hear presentations from the NRC staff regarding the new Construction Reactor Oversight Process called cROP, program applicable to construction oversight of new plants and results of the cROP pilot program conducted at Vogtle and Summer. Mr. Girija Shukla has been the ACRS technical staff member supporting this activity.

The staff briefed the subcommittee on March 6, 2012, regarding the new Construction Assessment Program applicable to construction oversight of plants that are being constructed under 10 CFR Part 52, and any future plants under 10 CFR Part 50 process except for Watts Bar Unit 2, which is covered by its own construction inspection program.

The staff developed the New Construction Assessment Program as directed by the staff requirements memorandum SRM SECY-10-0140. The cROP program includes a regulatory framework and the use of a construction Significance Determination Process to

determine the significance of findings identified during the construction inspection program.

The staff has implemented the pilot program at Vogtle Units 3 and 4 on January 1, 2012, and at V.C. Summer Units 2 and 3 in March 2012 upon issuance of their combined license. The SRM also directed the staff to provide the pilot program results to the ACRS for review. Now I call upon the NRO management to begin their presentation please.

MR. FRYE: Okay, we thought we would have Jim Luehman here who's our Deputy Director for the Division of Construction Inspection, but we actually have several meetings going on so I believe he's at a public meeting.

My name is Timothy Frye, I'm the Chief of the Construction, Assessment, and Enforcement Branch in NRO, and I had responsibility for the development and the pilot of the cROP, and so I guess I'll get us started. So let's see if I can figure this out.

And that was an excellent introduction. I think you've probably covered a lot of the stuff I was going to cover, so I'll try to pare mine down and not be too repetitive. But again, the purpose of this briefing is to discuss the results of the recently completed 12 month pilot of the new Construction

Reactor Oversight Process or cROP as we call it.

And our focus today will be on discussing the pilot results, the staff evaluation of lessons learned, key procedure revisions, and the staff conclusion on the readiness of the cROP for full implementation.

I will provide a brief and high level overview of the cROP and the pilot. Tom Kozak, who's up here sitting with me, has been the Project Lead for cROP development for the last several years and will discuss specific pilot results and our lessons learned.

So again, we covered a lot of this. As was mentioned, Commission Paper 10-0140 provided the background and detail of the development of the cROP. Subsequent to that Commission Paper, we did develop an especial manual chapter that provides a lot of background and basis for the processes. And you should have a copy of that and, you know, if you feel like referring to it feel free to.

And the reason why I mention that is because the purpose of this briefing is to discuss the pilot results and our assessment, and we have no planned presentation to review specific details of any of the processes, but certainly any questions that you

have that will help you understand how we've reached our conclusions and completed our evaluations, we're more than happy to, you know, address those. And, you know, referring to manual chapter 2506 probably will be a great help in understanding the processes as needed.

So I'm trying to see what was already discussed, so I think we got everything on that slide, based on that good introduction. So again, as you can see, we developed the Construction Reactor Oversight Process using, as the Reactor Oversight Process for power reactors as a starting point, mainly because it has been very successful in the ten or 12 years that it's been used.

So we wanted to use the regulatory framework as a starting point. And we did that. The major difference is that we have identified six cornerstones of construction safety, and so just like the ROP, the reason for this framework is, you know, we use construction inspection to verify adequate licensee performance and meeting each of those cornerstones of construction safety. And that gives us assurance that a plant is being built as per the licensing basis and operating procedures have been developed and implemented as required by the licensing

basis.

And on this diagram you can see that again, the basic components of the Construction Reactor Oversight Process are very similar to the Reactor Oversight Process. And those are inspection, assessment and enforcement for the most part.

Some of the key differences and challenges that we'll talk a little bit about that we had with developing construction oversight had to do with, one of the big differences is that a key part of our construction inspection program is inspecting the operational programs.

You know, operational program inspection is just not part of the Reactor Oversight Process, but it is a big part of construction inspection program because we need, there's about 19 key operating programs that have been identified in the licensing basis that we need to inspect before they're implemented to verify that they have been developed in accordance with the ASME, the industry standards or the regulations. So that's a very important part of our inspection program and that's a key differences between construction oversight and reactor oversight.

Also we have a very close tie to vendor inspections, which we'll talk about a little bit. So

that has been a challenge and will continue to be a challenge, coordinating vendor inspection results with the construction inspection program.

And finally, one of our most significant challenges was finding a simple and reasonable way to assess, I'm not sure what that is. I don't think it's somebody in here --

(Off microphone discussion)

MR. FRYE: Okay, so anyway, yes, so assessing the, finding a way to determine the, apply risk insights into evaluating the safety significance of construction findings to get some measure of their significance was a challenge and that's probably one of the biggest differences between us and construction, the Reactor Oversight Process and I think we were very successful in doing that.

So before I turn it over to Tom, I just wanted to kind of wrap up my overview by saying, at the end of this brief we hope to leave you with a good understanding of why the staff has concluded that the Construction Reactor Oversight Process was sufficiently exercised to provide reasonable assurance that the program is sound and ready to go forward with full implementation. So with that, I'll turn it over to Tom.

MEMBER SHACK: Did you go through the Significance Determination Processes too in this pilot?

MR. FRYE: Yes, we had a couple of chances to exercise it pretty well, and we can talk about that in more detail.

MR. KOZAK: Good afternoon. I'm Tom Kozak, I work in Tim's Branch in Office of New Reactors and Division of Construction, Inspection of Operational Programs, and had primary responsibility for developing the Construction Reactor Oversight Process and Significance Determination Process and everything else that went into the program.

(Off microphone discussion)

MR. KOZAK: The way we conducted the pilot is we issued a pilot guidance document that included the purpose, scope, objectives, and acceptance criteria that we had developed. And in that document we listed a number of manual chapters that we prepared that were for the pilot program. They were designated with a P, they're listed here on the slide, manual chapter 0613P is our findings screening and inspection report manual chapter, 2505P is our performance assessment manual chapter, 2519P is our construction Significance Determination Process manual chapter. I

believe those were all provided to you ahead of time.

Those were our primary guidance documents that we issued for the staff's use during the pilot. And they supplanted our normal manual chapters that were in place before the pilot and before, you know, when the Commission directed us to develop this program that mirrored the ROP, including those various programs that are in the ROP.

Also in manual chapter 2506 which Tim mentioned, it's our oversight process guidance and basis documents, so as Tim mentioned, it's a good history of what we've done as a staff to develop our oversight process, and also contains the guidance. So it's kind of two purposes in one, both the basis of the program and the guidance. And in that manual chapter it also described our approach for the pilot.

We conducted a detailed, you know, day and a half training sessions, two of them down in Region 2. We also trained our headquarters staff and made our training available to the industry as well. We put it on our public Web site and the industry used, I believe, our training as a basis to train their staff as well on what we developed.

This was a collaborative effort with the industry by the way, NEI had developed or put together

a task force, a cROP task force. We had a cROP working group and we met with them on several occasions at least 15 times as we developed the program. And so they were, you know, very involved with developing the program with us and provided good input.

Anyway, we trained the staff. We also issued Enforcement Guidance Memorandum, 11-06. What that Enforcement Guidance Memorandum did was give us authorization to disposition findings using colors like we do in the ROP and the Significance Determination Process, and issue notice of violations without severity levels. It essentially was our temporary guidance to provide the staff authorization to disposition findings like we do in the ROP. And as was mentioned earlier, we implemented the pilot at Vogtle on January 1st and at Summer in March when the COL was issued.

To date we've issued, actually it's been updated since our slides were prepared, I have an older version. We have seven Vogtle inspector reports and two Summer inspection reports. There's a third Summer inspection report that's coming out in the next few days that will cover the fourth quarter of inspection activities at the site. Included in that

report is the Corrective Action Program team inspection that we conducted at Summer.

My understanding is the results of the Corrective Action team inspection were basically positive with no big findings associated with that, that are of greater than very low significance. But that report is still in a draft stage and hasn't been issued.

MEMBER SKILLMAN: Tom, may I ask you please, to reinforce the point that you just made for both Vogtle and Summer let me make a statement. The cROP program depends on the sites or the owners corrective action program. And so there are approximately ten findings right now among the two plants.

But for us to have confidence that those findings are meaningful, we need to be confident that the corrective action program at each site is robust and healthy. And the CATI results will give us that confidence. So I would like you to say a little more about Vogtle and Summer and the CATI inspection or Corrective Action Program inspections that have been conducted in this past year.

MR. KOZAK: Sure. The baseline inspection program that we have requires the resident inspectors

to do daily reviews of Corrective Action Program documents, any things that are entered into the licensee's Corrective Action Program. And they do that and have done that throughout the course of the pilot.

They also do a focused look at, around five specific issues that have been entered into the Corrective Action Program and do an independent review of the corrective actions that are developed to address those issues.

Also required by our Corrective Action Program inspection procedure, and that procedure is Inspection Procedure 35007, Appendix 16, that's where our requirements are for our inspection. We also are required to do a team inspection. We conducted a team inspection earlier this year at Vogtle with a couple of findings that were of very low safety significance or green, and found in general that the licensee's program was adequately developed and implemented.

We're going to be conducting another Corrective Action team inspection at Vogtle in the next couple of weeks, I don't know the exact date when that will occur, but it's coming up in the near future.

We conducted the Corrective Action team

inspection at Summer in October I believe it was, and also found that the program was adequately developed and implemented. But like I said, the results of that inspection are yet to be documented.

Region 2 decided to combine the results of that inspection into the Quarterly Integrated Inspection Report and that report isn't due to be issued until February 15th is the due date, and I know they're in the final stages of putting that report together and issuing it.

But my understanding is that there were no findings that are of any greater than very low safety significance, and found that the program is working adequately to meet the regulations in Criterion 16 of Appendix B to Part 50.

MEMBER SKILLMAN: Tom, thank you.

CHAIR ARMIJO: Can I just conclude that you didn't find anything that was missed by the Corrective Action Program at these two sites?

MR. KOZAK: No, I don't think that, we had findings that there were for instance, an issue that was identified by one Corrective Action Program and put the corrective actions deferred to another Corrective Action Program. At the sites, the licensee has a Corrective Action Program, Westinghouse has a

Corrective Action Program, Shaw has a Corrective Action Program. And at times, well that's been a little bit of a challenge at the sites.

CHAIR ARMIJO: Yes, is there overlap, duplication, or everybody thinking the other guy is taking care of it?

MR. FRYE: Yes, so I think there was a May inspection at Vogtle and that was some of the findings that the different programs had different thresholds, they weren't communicating well findings and so, you know, with that Region 2 is not ready to say that they felt the program was effective at that time. You know, it was not effective to warrant non-standard violations, which is one of the reasons that we do the Corrective Action Program effectiveness inspection.

And the other reason that we do it is just because it's important to establish that we have confidence in their Corrective Action Program as was said, that that was one of the fundamental tenets of the Reactor Oversight Process and the green band is that we have confidence that they can identify and correct, you know, items of low safety significance.

So yes, so those were some of the results in the last year of doing the inspection. One challenge, we do have David Ayres here from Region 2

who can jump in as needed, but one of the challenges is that in order to inspect and evaluate the effectiveness of the program, you have to have a certain amount of throughput. They have to actually be, you know, exercising the program so that we can see if it's effective.

And with the amount of construction activity that's occurred in the last year, that was one of the challenges that Region 2 had in, you know, determining when they could go out and get a good look at the program.

And then another aspect of that, as we went through the year we realized that there were some improvements we could make in our guidance for how we inspected and assessed the effectiveness of the program. And part of Our Construction Experience Program, which is a subset of the Agency's Operating Experience Program, which I also have responsibility for, did a lessons learned review of how we assess the Corrective Action Program and we identified some changes to, in the future make this additional evaluation easier.

So we changed our guidance and we, you know, we streamlined it and provided some additional guidance to the regional management to help them, give

them more guidance and criteria about how to make that determination as to when they felt the Corrective Action Program was effective. So that's --

MEMBER SKILLMAN: Have any of the findings from either of the Corrective Action Program inspections caused you to conclude that either is deficient?

MR. FRYE: No.

MEMBER SKILLMAN: Okay. Thank you.

MR. FRYE: Yes.

MR. KOZAK: So I'll continue on with the slides here. The reason why we have more inspection reports at Vogtle than Summer is one, the combined license wasn't issued until the end of March so we didn't have a quarterly inspection report for the first quarter at Summer. And we separated out a couple of inspections from the Integrated Reports.

But the same amount of inspection and types of inspections have been occurring at both facilities since the combined license were issued. So it may be misleading a little bit that we have more inspection reports at Vogtle than we do at Summer.

All of our findings identified to date were very low safety significance. We process the findings through Our Significance Determination

Process. We determined that the safety, the Significance Determination Process is sound, it's a good approach we think, but we do have some improvements to make, you know, we tried to think of all of the different scenarios that we could ahead of time and the different ways that the words would be interpreted by the staff.

And there have been questions that have come up during the course of the year, and that will be one of the things that we address as we come out of the pilot and finalize our guidance documents. We received feedback, we've heard it and will be incorporating those types of things into our guidance documents.

MEMBER SCHULTZ: Tom, could you give us an appreciation for the level of effort, the resources that have been applied with regard to the pilot inspections? Just in general terms, it doesn't have to be in inspection hours or anything like that.

MR. KOZAK: Well in general terms, we have three resident inspectors assigned to each facility, specifically for construction. We also --

MEMBER SHACK: Is that per unit?

MR. KOZAK: No, it's per site.

MEMBER SHACK: It's per site.

MR. KOZAK: Right. So three at Summer for Units 2 and 3, and three at Vogtle for Units 3 and 4. And they've been there throughout the course of the year and they conduct inspections just like, you know, the resident inspectors at the operating units. As we have a daily presence there onsite.

And we also have in the region, Division of Construction Inspection, which is similar to the DRS type inspectors that we have on the operating side, specialists. And we've had primarily welding engineering inspections out there and structural inspections, looking at rebar for things like, you know, the basemat is the big thing that's going on onsite right now and so those are the types of inspections that we've been doing at both sites from a specialist standpoint.

MEMBER RAY: You had a site visit, subcommittee did and public meeting out there looking at this separation between oversight of operations and oversight of construction so.

CHAIR ARMIJO: Yes, I had a question on the, do the inspectors have access to the various Corrective Action Programs, list of corrective actions ongoing from each of the, is there a master list available so that you know it's --

MR. KOZAK: I don't know that there's a master list --

MR. FRYE: We're speculating right now, I don't know if David has an answer, but yes --

CHAIR ARMIJO: I'm not sure it should be but, you know, if I walked in there I'd like to see all of the things that are cooking for each --

MR. FRYE: Well, you know, that is one of our concerns is that it's, you know, having an integrated program is not a requirement of Criterion 16 of Appendix B, but it's, you know --

CHAIR ARMIJO: It could spot some overlap or unnecessary, or some gap.

MR. FRYE: -- the segregation of Corrective Action Programs has historically caused many challenges so --

CHAIR ARMIJO: Okay.

MR. AYRES: Yes, hi, this is David Ayres from Region 2, Division of Construction Projects. And there is no real big master list, but our inspectors do have access to all the different programs and all the different corrective action lists.

CHAIR ARMIJO: So they just work it that way.

MR. AYRES: It's working that way.

Sometimes you have to go a little circuitous route to get to some of it, but we're able to get to it.

CHAIR ARMIJO: Okay.

MR. KOZAK: Also during the pilot this year we implemented our Assessment Program. We conducted assessments after the first, second, and third quarters, the second quarter one being a mid-cycle assessment where mirroring the Reactor Oversight Process so the terms and types of assessments that we do will be familiar to you. It's the same idea we issued mid-cycle assessment letter, as I mentioned above, the findings were of very low safety significance and all of the units were in the licensee response column of our action matrix.

The action matrix is essentially identical to the Reactor Oversight Process's action matrix with the exception that we don't have performance indicators in construction. We had mentioned in our paper to the Commission that we were not able to come up with any performance indicators for constructions that would provide meaningful insights to performance and so we do not have that as an input to our action matrix. So the lone input into our action matrix is the significance of the inspection findings that we have.

We'll be conducting our end-of-cycle

assessment this coming Monday and excuse me, and we'll be issuing our End-of-Cycle Assessment Letter March 4th. It will be issued the same day as the Operating Reactors Assessment Letters.

We'll also be conducting public assessment meetings in the vicinity of the sites. And those are targeted for mid to late March or early April, although they don't really have to be completed until six months after the letter comes out, but our preference is to do them sooner rather than later.

MEMBER SKILLMAN: Have you conducted public assessment meetings before?

MR. KOZAK: We conducted a public assessment meeting at Vogtle because we had implemented our Corrective Action Program, or excuse me, our Construction Inspection Program at Vogtle when the limited work authorization was issued a couple years ago, so we have had a public assessment meeting at Vogtle.

We did not have a public assessment meeting at Summer, although we have conducted two public outreach meetings at Summer to reach out to the public, let them know what our inspection program is, you know, composed of, and show the public where information is located on our Web sites and that. So

we've had meetings, but the assessment meeting only at Vogtle so far.

MEMBER SKILLMAN: May I ask, for those three meetings, what the attendance has been and what the tone has been?

MR. KOZAK: Well, just to clarify, we had another meeting at Vogtle so for the oversight process we've had four meetings, two at each site.

MEMBER SKILLMAN: Okay.

MR. KOZAK: And the attendance was fairly good I would think. I would say about 50 or so members of the public at each site. And there's interest from local public in what activities are going on at the site. They're aware of the findings that we've had from looking at them on the Web site. They are also aware of license amendments that have been submitted.

Overall the tone I would say, has been questioning us, finding out what we're doing, but no real, nothing very negative I would say. So I think that, what I would say at the end of the meetings, several people approached us and thanked us for coming out and providing the information to the public and, you know, requested that we do this on a routine basis.

MEMBER SKILLMAN: Thank you.

MR. KOZAK: So once we finished the pilot December 31st, we solicited stakeholder feedback. We, actually at the end of the pilot, towards the end, we issued internal and external surveys. Quite frankly, we haven't had a lot of interest from external stakeholders outside of the, obviously the licensees responded to our survey, but no other responses from any other, say public interest groups or members of the public or anything like that. And we have attempted to generate interest, we've sent invitations, done press releases and --

MEMBER SHACK: Free pizza!

MR. KOZAK: Yes.

MR. FRYE: We were as creative as we could be.

MR. KOZAK: Right. And it's just not on the radar screen right now for a lot of people. So it is what it is. We received, about half of the inspectors took the time to respond to our internal survey and we've got a good feedback from that.

And then we'll be conducting, we're in the process of conducting a self assessment, and that self assessment will include an evaluation of the pilot and will be reported to the Commission in a SECY paper

that's due mid-April.

And we'll be doing that in support of the Agency Action Review Meeting, and that is done in parallel to the Reactor Oversight Process, it's self assessment. Not as detailed, we only have four plants, so resident demographics and things like that aren't as, you know, you don't learn a lot from them. So we don't have all that type of information in there.

But we do a very thorough look at how we've implemented the program, the findings we've had, and how we're spending our resources and things like that.

MEMBER SKILLMAN: For the participation that you have had from the public in the locality, has it crossed your mind to discontinue the meetings because there isn't amount of participation you might have wanted, or is the idea, let's keep doing this?

MR. KOZAK: No, the idea is to continue doing it. And like I said, we had about 50 members of the public at the meeting so that's a pretty good turnout. What I meant when I said we haven't gotten quite the responses that we expected to our surveys and things like that, the members of the public while they do come to our meetings, they're not taking the

time to respond to our surveys and that sort of thing.

And, you know, even though we reached out to various interest groups, they were not interested in being part of the development of the Construction Reactor Oversight Process. If you recall, Reactor Oversight Process was a large involvement with various different representatives from all different types of stakeholders. Even though we reached out, we didn't get that same type of interest for the Construction Reactor Oversight Process.

MEMBER SKILLMAN: Okay, thank you.

MR. FRYE: And just to add to what Tom said, one thing that we will always continue to do is go out at least once a year as part of our public meeting, that's part of our assessment process, where we will discuss the results of the assessment for the last prior year. We also discuss the program in general so that's just built into the program. And so we will always be going to the site in a public meeting at least once a year for that reason.

MEMBER SKILLMAN: Thank you.

MR. KOZAK: So during the pilot we had a number of initial lessons learned. We put out revisions to our pilot documents to incorporate these lessons learned. I'll go through a couple of them

right now. We modified our guidance for our Corrective Action Program effectiveness reviews.

What we learned, we did a, through our Construction Experience Program, we did a review of why we hadn't done our Corrective Action Program effectiveness review early on in construction. And we learned that some guidance that we had in our inspection procedure and our manual chapter had an unintended consequence of delaying that effectiveness review because we had put in there that we weren't going to do the effectiveness review until the licensee told us they're ready for that review and there was enough throughput through the program.

And we also had assigned that evaluation to the annual Corrective Action Program inspection team. And through feedback from the inspectors and our own review through our Construction Experience Program, we determined that that review should be done on a management level, and it should be done as part of our assessment program, reviewing the record of our inspections of the Corrective Action Program, because there's more than as I mentioned earlier, more than just the team inspection. We have the residents looking on a daily basis at issues that are entered in the Corrective Action Program. We look at specific

issues.

Every one of our baseline inspection procedures has a Corrective Action Program element to it so we look at it continuously, it's not just through the annual team inspection. And so we changed our guidance to move the Corrective Action Program effectiveness review to the mid-cycle and end-of-cycle assessment meetings.

And it will be done by management in Region 2 based on what is on the inspection record for the Corrective Action Programs. And we think that that will be a better approach than we had initially thought of doing when we put our guidance together.

We provided additional guidance for our assessment letter contents. If you're familiar with the Reactor Oversight Process, on our assessment letters the only inspection findings we ever talk about are those that are greater than green. Otherwise we say, we conducted our baseline inspection program, all findings were green and the licensee is in the licensee response column.

We felt that for the construction program, when we first put our guidance out we had the same type of guidance. For the Construction Inspection Program though we thought, since we have greater

flexibility in our baseline inspection program to increase and decrease samples especially within ITAAC area, that we thought that it would be good to summarize the results of our baseline inspection program even if we didn't have greater than green findings, if we were going to use those results to focus our future baseline inspections in a certain area.

For instance, if we had findings in a design control area and we were going to increase our look and our baseline program and design control, we could put that into our mid-cycle or end-of-cycle assessment letter. And we think that that communicates better to the public what our inspection program is identifying and where we're going to focus our efforts. And not only to the public, but to the licensees.

VICE CHAIR STETKAR: Tom, does it have an unintended consequence to the public that, you know, in the normal Reactor Oversight Process they don't see anything, any of the details of things that are judged to be green. Here they see the details of everything which gives the impression that, my God, you're finding a lot of things during construction, that there's a lot of problems. What's wrong?

MR. KOZAK: Well we're not, our guidance --

VICE CHAIR STETKAR: Because you don't have that differentiation, you don't have that metric.

MR. KOZAK: Right. Our guidance isn't to discuss every finding that we've had.

VICE CHAIR STETKAR: Okay.

MR. KOZAK: Our guidance is to briefly discuss an area where we may be focusing our baseline inspection program. So we're not --

VICE CHAIR STETKAR: Okay.

MR. KOZAK: -- we're not doing a rehash of all the findings that we had.

VICE CHAIR STETKAR: Thanks.

MR. KOZAK: We provided additional guidance for ITAAC finding documentation, this was based on feedback we received from the licensees and reading our inspection reports, that we weren't as specific as we could have been in tying our finding to an ITAAC acceptance criteria. And we thought that was good feedback and it will help us also when we go to close the issues, to make sure that our findings are tied directly to the acceptance criteria if we do have an ITAAC finding.

We added a requirement to track licensee-

identified violations. Typically if we document a licensee-identified violation we don't track that. We don't assign a tracking number to it. But if it's involved with an ITAAC, we thought it would be most efficient for us to assign a tracking number to licensee-identified violation and enter it into our information technology system so that when we get the ITAAC closure notification, anything that we have documented that's associated with that ITAAC will come up when we do a search and will make our ITAAC closure notification verification more efficient. So that's why we did that.

We clarify the role of vendor inspections and ITAAC verification, we just added some guidance to manual chapter 2506 so that when our vendor inspectors are out at a vendor facility and they're looking at something that's associated with an ITAAC, that we make sure that we get that information that if there are any findings, to the inspectors in Region 2 so that when that component or whatever it is comes from the vendor and goes to the site, the inspectors are aware of any findings that we might have as a part of our vendor inspection program.

And then we attempted to clarify the difference between vendors and suppliers and

contractors working on behalf of the licensees. This is an area that we're doing some, making sure that we're clear in our guidance documents, when we consider work being conducted as a vendor and when work is being conducted on behalf of the licensee by contractor, the people that they have contracted to help them build the plant in accordance with its design.

The way we evaluated the pilot program results is we had eleven metrics in four different areas. These were the metrics that were in the memo that I mentioned at the beginning that we issued for the pilot with the objectives, scopes, and acceptance criteria. The four areas we had were the risk informed baseline inspection program, the assessment --

MEMBER BLEY: I guess this is a point I'd like to ask a question. I see you have some backup slides maybe I'd like you to get to. But can you walk us through what the different colors actually mean and what do we mean by risk-informed in these inspections?

MR. KOZAK: The colors?

MEMBER BLEY: Green.

MR. KOZAK: Oh, sure. Well green represents the significance of very low safety

significance. White --

MEMBER BLEY: Measured how?

MR. KOZAK: Okay, the --

CHAIR ARMIJO: Got that chart.

MEMBER BLEY: I'm trying to get him to go there.

MR. KOZAK: Oh yes, you want us to go through the SDP, to show how we get to a certain color?

CHAIR ARMIJO: Yes, go to the backup.

MR. KOZAK: All right, do we have the backup?

MEMBER SHACK: You knew you were going to get to the SDP when you put it in.

MR. KOZAK: Well I told him, but he made me take it out.

MR. FRYE: I didn't want to talk about it. So is it the backup?

CHAIR ARMIJO: Yes.

(Off microphone discussion)

MR. FRYE: You know, while we're trying to get set up, one of the things that is consistent with the ROP is that the green, white, yellow, and red, while they have a risk-informed basis to them, they're also defined by the type of regulatory reaction that

we want to have. So sometimes we use deterministic or expert judgment but, so the common theme between the green, white, yellow, red, between ROP and Construction ROP is how concerned we are, the indications of how pervasive the performance deficiency is by the licensee and what our response should be. So that is one common factor between --

MEMBER BLEY: I don't want to be flippant about this, but that almost sounds like, if we think they ought to get their wrists slapped, we'll give them a different color, and they don't need to know the systematic path.

MR. KOZAK: No, that's not the way it works.

MR. FRYE: No, that, yes. I may not have explained it as well as I could have, but --

MR. KOZAK: Want me to go through this?

MR. FRYE: Yes, go ahead, please.

MR. KOZAK: The flow chart here that we have up on the screen is where we begin our Significance Determination Process. Tim mentioned earlier that we have a unique thing in construction where we have to look at the adequacy of programs. So that's what this flowchart is, is it basically is asking if the finding is part of an operational

program or a construction program. And if there's a critical attribute of that program that's missing, then if we have not previously identified it it's green, and if we have previously identified it it's white.

And what I mean by a critical attribute would be, a good example is, in Criterion 16, the requirement is to identify and correct conditions adverse to quality. If we went and reviewed a licensee's Corrective Action Program, and it did not have a requirement in it to enter conditions adverse to quality, in other words identify them and correct them, then that would be an omission of a critical attribute in the program.

And so if that was the first time that we identified it, you look on the bottom left where it says, the Circle Number 5, if we have not previously identified it, it would go to green. However, if we identified a finding and we went back and did another look at their Corrective Action Program and found that they had still not fixed that and had not entered that requirement into the program, then that would be a white finding.

So we think that it's, you know, we should only have to do, the idea behind that is if there is

a, there would be a problem with their internal controls if they haven't successfully identified a problem that we --

MEMBER SHACK: They corrected a problem you identified then.

MR. KOZAK: Right. So that's why it's a simple green, white threshold there. So that's the left part of the, most of the findings are going to screen right out of this and go into the technical finding SDP because the programs, usually the programs have those attributes they just fail to implement them adequately, of the types of findings we get. So, but we had to have this part and it's really deterministic, there's no --

MEMBER BLEY: Let me ask you a question then. If you spot something during construction, I'm looking at the second box up there coming down, and it's related to a safety system in the plant, such that if the plant were operating, that system might not function properly, does that then shift you off? Because it looks to me like you would then go to the regular ROP and evaluate the actual risk associated with that --

MR. KOZAK: Right, in the second box there, the idea is if the operational program has

already been implemented, we would use the ROP SDP to evaluate the finding. If the finding's associated with construction, the third box says, is the finding only a programmatic issue, no technical issue? If the answer to that is no, meaning there is a technical issue, that kicks us off into the technical finding SDP.

MEMBER BLEY: And even for the technical finding it's got to be repetitive before --

MR. KOZAK: No it does not.

MR. FRYE: So keep in mind that this left hand side of this SDP deals with the unique situation for construction where I talked about briefly at the beginning, where we need to do programmatic inspections of the 19 key operational programs that are identified in the licensee basis that need to be developed and implemented, need to be developed and in place by a certain point prior to fuel load for example, but may not have been implemented yet.

So it's that case where it hasn't been implemented yet but we need to go out, we go out and inspect it and we find some fundamental flaw that they have not, you know, addressed a critical attribute. And so that's really, that scenario that that left hand side gets in. And as you can see, we decided

pretty early on that if the program hasn't been implemented, it's really hard to get above a white finding because just really, it's not any more safety significance than that because it was not implemented so it's not an associated technical impact.

CHAIR ARMIJO: Go to the next slide.

MR. KOZAK: So we have a technical finding that goes through to the right there, Block 6 into Block 7. And if we can associate it with a system or a structure, then it goes to our technical finding SDP. And our technical finding SDP is based on a matrix that you can see in front of you. On the y-axis, it's a measure of quality of construction. And that's a deterministic look at the finding.

And what this is, is Row 1 would be, the finding has no impact on the design function of the system or structure that we have the finding associated with. Row 2 would be, if you have an impact on a portion of the system or structure that the finding's associated with. Row 3 is if the finding results in the whole system or structure not being able to meet its design function. Row 4 is reserved for if there's a repetitive, significant condition adverse to quality associated with the finding. So you escalate one row if you have a

repetitive, significant condition adverse to quality. And that's how the matrix works.

On the x-axis, you see very low, low, intermediate, and high. And what that refers to is the safety significance of the structure of the system that's involved.

VICE CHAIR STETKAR: How is that calculated?

MR. KOZAK: We did it with, we had an expert panel that we put together that yes, were PRA experts, if you recall Don Dube who used to be with the NRC and retired recently, he was one of our experts with --

VICE CHAIR STETKAR: Really difficult if I have a core damage frequency on the order of pick a number, ten to the minus six, for any expert to differentiate risk achievement worths less that four, four to 40, 400 to, I mean that's kind of, the numerical precision that's implied by that x-axis is misleading, let me just say that.

MR. KOZAK: Well, yes. And it was meant to be kind of a high level look on a way to distinguish between the more safety significant systems in the plant and the least safety significant.

VICE CHAIR STETKAR: But what I'm hearing

you say, and maybe there's more, is that you got a bunch of people together and said yes, I think this is probably important, yes, this is probably not so important.

MEMBER SHACK: Well no, they used the SPAR model and they used the --

VICE CHAIR STETKAR: Okay, they used the SPAR model. Okay now, what's the basis for the SPAR model?

MR. KOZAK: You know, I have to defer to PRA experts there. I'm not prepared to answer.

VICE CHAIR STETKAR: I'm aware of some PRAs that were done for new designs that didn't model at all some systems, didn't model them at all. Hence, by definition their risk achievement worth is zero because they're not even in the model. So they won't even fall on your radar. And the SPAR models are simplified models of the licensees or the applicants here.

MEMBER BLEY: Not so simplified anymore actually.

VICE CHAIR STETKAR: For the new plants though, they are. These are new designs. So I'm curious about this numerical precision.

MEMBER SHACK: I'm not arguing. Let's say

he's got a much --

MEMBER SHACK: Once you get the RAWs from the PRAs, then they go back to the expert panel and, you know, then they end up with again, they go system by system using engineering judgment.

MR. FRYE: I don't think we're advertising this as a risk-based, you know, approach. It's risk informed and it's --

VICE CHAIR STETKAR: You're using numerical values though and my question is what's the basis for that numerical value?

MR. KOZAK: Well, the approach is detailed in the main body of the manual chapter 2519P. But we would have to get back to you, we're not prepared to address your questions.

VICE CHAIR STETKAR: In principle though, well not in principle, in practice, especially for the new designs that have a fair amount of redundancy and a fair amount of diversity, I think it would be really hard pressed to get anything but green, regardless of this completeness issue.

MR. KOZAK: Well there's, are you really, are you talking about when the plants are operating?

VICE CHAIR STETKAR: No, no, no, no, I'm talking about, you know, I'm still hanging up a bit on

your use of what you're calling a risk-informed approach with these numerical criteria.

MR. FRYE: Well, we have a firm finding right now that is in our high column.

VICE CHAIR STETKAR: So by implication of this, that was judged to have a risk achievement worth greater than 400.

MR. FRYE: Correct.

VICE CHAIR STETKAR: Because that's the only way you can get up to that corner is that --

MR. FRYE: -- high at any rate, you have your other table.

MR. KOZAK: Right. Go on to the next slide. This is the systems where we assign to the various columns and they were done with experts from Westinghouse, from Southern Nuclear Company from, you know, South Carolina Electric and Gas, and from the NRC through a meeting and these were the systems and what columns they were assigned to based on the risk achievement worth that they assigned to those various systems. And so we covered all of the systems during the expert panel, and there was consensus reached between the various parties that were there. And that was the approach that we took to assign.

VICE CHAIR STETKAR: The only thing I'm

questioning is not a bunch of smart people sitting around a table saying yes, I think spent fuel system is very low. Or I think containment isolation is probably low as far as risk is concerned because it doesn't affect core damage frequency. Maybe, maybe not. And, you know, maybe the containment recirculation might be high. Those are qualitative judgments made by experts. That's no problem with doing that as long as that's the way you sell it.

If you're saying you're using risk models to come up with quantitative estimates, that requires a certain amount of quality in those risk models, a certain amount of completeness.

MR. FRYE: Well again, I think we're saying that we're using a risk-informed approach to use risk models to inform our expert panel. I mean, I don't think we're advertising this as risk-based in any way.

MR. KOZAK: We used the PRA that was submitted with the Design Certification.

VICE CHAIR STETKAR: Yes?

MR. KOZAK: And it is what, you know, the quality of, it is what it is and that's what we used to come up with the risk achievement words through calculations done by the, you know, by Don Dube

primarily and agreed upon with the other PRA experts.

VICE CHAIR STETKAR: You can crucify Don because he's retired.

(Off microphone discussion)

MEMBER BLEY: Om the other hand, given the alternatives for ways to rank these things, to me this feels like a good step forward.

VICE CHAIR STETKAR: It's okay, I'm just, as I said, I don't have any problem with --

MR. FRYE: I don't think we're trying to oversell it for, you know, trying to make it any more robust than it is or any more risk-based than it is.

MEMBER BLEY: And the right column isn't empty, which --

VICE CHAIR STETKAR: The right column isn't empty and there's probably good reason for that. It's just that the numerical values that you showed on the previous side are quite honestly, very surprising.

MALE PARTICIPANT: Well that was --

VICE CHAIR STETKAR: People have used, yes let me finish then I'll --

MALE PARTICIPANT: I'm sorry.

VICE CHAIR STETKAR: People have used the PRAs to identify either RTNSS for AP1000 or DRAP equipment. And they use criteria of, for example,

risk achievement worth greater than two as being risk significant versus non-risk significant. And they come up with a very modest amount of risk significant stuff by doing that. And yet you're expanding that scale out to risk achievement worths on the order of 400 and populating things with a fairly large amount of --

MEMBER BLEY: On the other hand if you look, it looks like what they've done, shame Don's not here, it looks like what they've done is they've taken out the whole function associated with whatever was failed, which pushes you to the higher end --

VICE CHAIR STETKAR: Pushed you to the higher end.

MEMBER BLEY: -- which gets attention to it. And in fact, once these things are spotted, I assume most get fixed. Certainly the ones at the high end but almost everything, I mean you're doing the inspection program, you find it and the plant's not operating yet.

MR. KOZAK: And the ideas are, we have a sampling inspection approach. And if we find that the quality of construction on a high, on a system assigned to the high column has, you know, has affected the design function of that, we want to

engage with the licensee and respond to that to look and see what's going on on lower significant areas. And that's why we would do a supplemental inspection, and that was kind of the concept behind this.

So since we do the sampling, we felt that, and if you look at the matrix, if you back to the matrix, you know, you can see that if you only, on Row 2 there, if you've affected a portion of a high, system that's been assigned to the high column, you get a white finding and we're going to do a supplemental inspection with the idea that, you know, if there's deficiencies identified with the higher risk systems, what's going on with the other ones, you know? So that's the concept that we had and that's why we say it's risk-informed, this is how it's risk-informed.

And it's also risk-informed through our targeting process for ITAAC. That was a consideration that was taken into account on the ITAAC that we're inspecting. That's why our inspection program is also considered risk informative. That was the consideration given when we ranked the ITAAC and determined which ones we were going to be inspecting, again as sampling program we look at approximately 30 to 35 percent of the ITAAC in our baseline inspection

program.

So that's how our SDP works. It's, we hope repeatable and, you know, there's some subjectivity that goes into the y-axis. The x-axis is already predetermined so the inspectors aren't doing any type of calculations or anything like that. That's been working well, it's easy to identify where it goes, what's been, you know, where we need to work on is clarify what is meant by the rows on the quality of construction, the measure of quality of construction on the y-axis and that's what we're working on.

MEMBER SHACK: Yes, the words you were using are a little different than the words that are in the document. Now I don't know whether that's just your casual thing or you actually have some changes in mind from the, you know --

MR. KOZAK: Probably a little of both.

MEMBER SHACK: -- at least the draft document we were looking at.

MR. KOZAK: Manual chapter 2519, I think if you look in Appendix A, which is the AP1000 --

MEMBER SHACK: Right, that --

MR. KOZAK: -- and you look at the AP1000 SDPs, if you go to the steps, and I believe it's Step

12, I think that's where it mentions the --

MEMBER SHACK: Okay, so this is where we can get the definitions of Row 1, 2, and 3, 4 in the text.

MR. KOZAK: The main, right.

MEMBER SHACK: Yes.

MR. KOZAK: That's kind of the overall concept.

MEMBER SHACK: Okay, so look at the detail in the appendix, okay.

MR. KOZAK: Right, right, and it would be the design function of the system or structure that is in question. And we've defined the design function, we've pulled it out of the DCD and it's right in our manual chapter, so that's right there as well.

MR. FRYE: And we had the opportunity to exercise this at least two or three times during the pilot. And I think --

MR. KOZAK: Well no, we've exercised it for every finding so, the ten findings.

MR. FRYE: Well, I don't know, you know, okay.

MR. KOZAK: No really, I mean --

MR. FRYE: All right thank you, yes. And I think the feedback we got from the regional

inspectors is that the tool has been successful at, you know --

MEMBER SHACK: Well wait until you get your first white or yellow finding and then you'll --

MALE PARTICIPANT: Right, take another look.

MR. FRYE: Yes, but yes, so, you know, and we're not saying that it's right, that there aren't changes to make in the future, and that's just a key aspect of this whole presentation is that we realize that, you know, even though we're ready for full implementation, that we will continue to assess this program and identify changes to make it better.

MR. KOZAK: Now the key I think is that we determined that the Significance Determination Process can be applied to construction. And it's working. Clearly today, in the ROP the Significance Determination Processes are being revised to address issues that come up and people hadn't thought about and it's 12, 13 years later.

So we're just in the first year, we certainly have things to incorporate in the quality of construction for sure. So far we're comfortable with what the risk importance determinations were, it seems to be working okay. We're focused more on clarifying

when a finding can affect the design function of a system or a structure and what row it should go into. That's where our focus is right now on improving our SDP.

But it's not just a, you know, by putting this together, that was our attempt to be repeatable and predictable. And I think that really, the debate centers around the row right now and we need to hone in on that. That's where our improvement needs to be.

But when we conclude that we're ready to go fully implement the program, we do that because we believe that the approach is sound. And at first we didn't know that we could apply a Significance Determination Process to construction, but we think it works, it's working.

MEMBER SKILLMAN: Let's go back to Slide 12 and continue please.

MR. FRYE: If I can figure out how to do that.

MR. KOZAK: It's the same --

MEMBER BLEY: Type 12 and hit return.

MR. FRYE: Oh, okay.

(Off microphone discussion)

MR. KOZAK: So we evaluated our eleven metrics, they were in that memo that I mentioned

earlier in these four areas, and we had a public meeting yesterday, invited whatever stakeholders wanted to attend. We had NEI members, SCANA, and Souther Nuclear representatives. And we went through, and we also had a person from Dominion who was on the task force. And we went through the eleven metrics and agreed that we had met all eleven metrics and there was agreement between the industry and us that we should fully implement the program.

A question that we asked in our survey was, has there been sufficient activity during the pilot? We wanted to make sure that we had exercised the program enough through the pilot. And the consensus both internally and externally was that we did. We had enough throughput to conclude that the structure of the program is sound.

I mentioned some lessons learned that we incorporated and will continue to do that. It will be a living process, but the consensus is that yes, we're comfortable with moving forward with the program that the regulatory framework is good, the Significance Determination Process is, you know, works. A construction action matrix can be applied to construction. So from that standpoint we feel we're ready to implement fully.

Some additional feedback that we received, I have already talked about this with the SDP, the first bullet, clarify when a performance deficiency can be considered to affect the system or structure design function as used in the SDP, we're working on that. We've had suggestions to add a chapter to the enforcement manual for construction, we're working on providing input to OE, our Office of Enforcement for that.

Cross-cutting aspects, we have cross-cutting aspects in construction. We're going to take a longer term look at the cross-cutting aspects to make sure we have the right ones for construction, but that's going to be on the heels of what the ROP does to address the Commission's Safety Culture Policy Statement.

What our approach was is we looked at the aspects that were in the ROP and we eliminated the ones that clearly didn't apply to construction and kept the other ones, and just used those moving forward. So we think we can do some work in this area but it will probably be a year off into the future before we do anything significant in this area.

MEMBER RAY: Wait, why is that? I guess, let me put it to you this way, if you find a whole

bunch of greens like you have so far, and they were all due to a common reason, would you have recognized that?

MR. KOZAK: Yes, because we do have cross-cutting aspects and we do apply them to the findings. What we're talking --

MEMBER RAY: What are you putting off then?

MR. FRYE: Well, we think there's areas for improvement. We think that there might be some cross-cutting aspects that are more relevant to construction that we don't have yet.

MR. KOZAK: We've had some suggestions that we could possibly have cross-cutting aspects in the area of quality assurance because primarily, that's where we do our inspections in construction. So we could have aspects in the various criterion of Appendix B. So it might be more relevant to construction. But the aspects that we are using identify things such as procedural, you know, adherence, resources, those types of things, work control. So we still have the ability to tag the findings and identify trends.

MEMBER RAY: Well what about the, for example, ineffective internal oversight? Not

implementing an Appendix B program in other words.

MR. KOZAK: Right, we could capture that with aspects that we have today. However, I think that we could probably develop some that are more directly related to construction. So it might be, you know, addressed specifically what you just brought up. But we can tag the finding with the aspects we have now and get a trend in an area like that.

MEMBER RAY: Yes, I mean, I think it should always be assumed that because the Agency can, at the end of the day ever only do sampling, that what you're really trying to do is not find the really bad, red finding, but to find something that could and might have, without your knowing it, resulted in a condition that's like a red finding.

MR. FRYE: Yes, leading indicators, that's our goal.

MEMBER RAY: Yes, and I just, when you said it was being put off, it didn't sound like you --

MR. FRYE: Well, let me just add to that. We are actually, we've had numerous design control findings in our first year of construction. And we have a, again, we've taken the construction experience program is looking at those to determine if we are evaluating those and acting on those properly. And

one of the key areas that we're looking at is the cross-cutting aspects. Are we assigning the right cross-cutting aspects to these design control issues so that we can identify a trend and act on it. So, you know --

MEMBER RAY: Well, I don't know if trend is the right --

MR. FRYE: Well, that might not be the right term but --

MEMBER RAY: -- term, but I mean it's really a question of, you have to assume you can't do enough inspection to find a really serious problem. The best you can ever do is do enough inspection to determine that the program isn't being implemented effectively and as a result of that there may be a serious problem. That's the best you can ever do.

MR. FRYE: I think we would agree with that and that's what we're trying to get out of the cross-cutting aspects.

MR. KOZAK: I didn't mean to leave you with the impression that we're not able to use cross-cutting aspects to categorize our findings, if you will.

MEMBER RAY: Well, I guess I just would have said, and I realize I'm not, maybe being a little

harsh here, but have you found any yet?

MR. KOZAK: Yes.

MEMBER RAY: I mean, you reported that all of the findings so far were of very low safety significance. But the more important issue is, did any of them identify, or a number of them taken collectively, identify a programmatic problem or what we choose to call a cross-cutting issue.

MR. KOZAK: Right. We have not identified a substantive cross-cutting issue at either site so far. We do have the criteria in place to do so if we get four aspects in the same, or four findings with the same aspect --

MEMBER RAY: Is that a trigger for you?

MR. KOZAK: Yes.

MR. FRYE: Yes, that's a trigger.

MEMBER RAY: Four findings with the same aspects.

MR. FRYE: Right, so it's important to realize that we have identified cross-cutting aspects for the majority of our findings that we've had. They have not reached the triggers for us to take additional action, one of the triggers being four related, you know, four of the same cross-cutting aspects, which indicates some sort of adverse trend

which we will then pursue with the licensee to make sure that they have identified it.

MEMBER RAY: I don't know, my first reaction is well, gee four is a pretty high threshold.

MR. FRYE: Well, and that's why we're taking it as an action that requires some additional review. We do have our process right now, it works, it could be better, and that is one reason why I opened a Construction Experience Review, to see if there's any lessons learned based on all the design control issues that we identified in the first year.

MR. KOZAK: I'll just mention that we have the same threshold for construction that they have in the Reactor Oversight Process. Their four aspects, four findings with the same aspect is one of the criteria for us from stand of cross-cutting issues. So we use the same threshold as they have in the Reactor Oversight Process, the other criteria being that the licensee has failed to recognize the trend and not taken adequate action to address it.

But, so we use the same approach, we use primarily the same aspects that are in the ROP, the only ones we eliminated were ones that had to do with operational performance, which is clearly not applicable. But we used all the rest of the same

aspects, we have the same criteria, we just haven't had, we've only had six findings at Vogtle and four at Summer, so we don't really have the throughput --

MEMBER RAY: Yes, well I guess all I'm saying is that measuring the significance of the finding to me isn't nearly as important as seeing a common cause among them.

MR. FRYE: Oh yes.

MR. KOZAK: I think we agree completely. And we --

MEMBER RAY: Make them whatever color you want, I don't care, but do they have any common theme, you know?

MR. KOZAK: And that's, it gets back to one of the things that I mentioned earlier about our assessment letter, where we're talking about areas that we have found a number of issues in our baseline inspection program, where we would focus our baseline inspection programs. So in addition to the cross-cutting aspects, if we don't get a substantive cross-cutting issue, we are still looking for areas where we're seeing deficient performance during our assessment process, and focusing our baseline inspection program in those areas.

MEMBER RAY: Okay.

MR. FRYE: So just to maybe wrap it up, I think all's we're saying is that we recognize that this is an area that we can continue to evaluate for improvement because, you know, there's area for improvement that we've seen so far.

MEMBER SKILLMAN: Let's proceed.

MR. KOZAK: Next slide please, thanks. So one thing we did when we developed our program is we think we sliced the types of findings a little too thin. We have a lot of different types of findings, an ITAAC finding, an ITAAC-related construction finding, programmatic findings, technical finding, and we thought when we were developing the program that this was a good idea, but instead it's introduced a lot of confusion and so we're going to eliminate all these different types of findings and have a construction finding, or a construction ITAAC finding, that ITAAC finding being, you know, the finding is associated with the acceptance criteria of the ITAAC, and we need to separate that out for the ITAAC closure notification process so that we're able to pull those up readily at the end, so that's a lesson that we learned.

MEMBER SKILLMAN: Let me ask you this, before you make that change and unknowingly throw out

the baby with the bath water, is it too soon to make that change?

MR. KOZAK: I don't think so, we've thought about that and we're not really losing anything by, the only reason we have, for instance, a programmatic finding was because we had that programmatic SDP that we went through. So if you end up in a programmatic SDP you have a programmatic finding. But it doesn't really add anything.

MR. FRYE: No value added, so --

MEMBER BLEY: If it's yellow it's important.

MR. KOZAK: Right. If we have a white finding in a programmatic area it's a white finding, but having it designated as a programmatic finding added no value. So it was only introducing confusion when the inspectors would have a finding they're like, do I have a programmatic finding or do I have a technical finding or an ITAAC, what do I, you know? And it was not necessary to distinguish between that because you start at the very beginning of the SDP anyway every finding. And if it ends up being programmatic, it ends up being programmatic.

So the one thing we didn't want to throw out was the ITAAC finding because that serves a

specific purpose for us and when we looked at it, that was the one that we needed to keep.

MEMBER SKILLMAN: So now you have two, construction and ITAAC?

MR. KOZAK: Correct, that's what it will be. Well, we haven't made the change yet but we're planning to upon full implementation.

MEMBER SKILLMAN: Thank you.

VICE CHAIR STETKAR: So, Tom, what's an example of a construction finding that wouldn't be an ITAAC? Do you have any from --

MR. KOZAK: It could be anything, any finding, it could be for instance, a Corrective Action Program, failure to properly implement Corrective Action Program, where you --

VICE CHAIR STETKAR: Okay.

MR. KOZAK: -- something like that.

VICE CHAIR STETKAR: Would it be dedication receive instruction that's just not tied to a specific ITAAC?

MR. KOZAK: One other thing we learned is we received some feedback about our vendor inspection reports where we have discussed ITAAC. We mentioned earlier that we're with the vendors, inspectors are going to vendors and looking at issues that are

associated with an ITAAC.

And if they identify a finding, the detail in the inspection reports wasn't matching the detail that we had in the licensee inspector reports. And so we worked internally on that trying to get our guidance for both vendor inspection reports and licensee reports the same, so that we document the ITAAC findings the same way. So that was another lesson learned that we had.

MEMBER SKILLMAN: I'm confused about the text in that second bullet, the ability for the NRC to meet the applicable ITAAC. Actually it's the --

MR. KOZAK: Right. That, I'm sorry, is a typo, it should be the licensee.

MEMBER SKILLMAN: That's a typo, bingo, thank you.

MR. KOZAK: Yes.

MEMBER SKILLMAN: Thank you, okay.

MR. KOZAK: So those are the primary things we're going to, lessons learned and the results of the pilot. Key revisions that we think will support full implementation is to develop and revise the enforcement policy and a chapter in Enforcement Manual for construction, that's going to be done in parallel to implementation, it takes a long time to

get a policy change out in a manual, an Enforcement Manual change out so we'll leave the Enforcement Guidance Memorandum in place, but work on getting a chapter added to the Enforcement Manual and get the Enforcement Policy up to date to match how we process findings, get the guidance in our Enforcement Guidance Memorandum 11-06 into the policy.

We want to revisit cross-cutting aspects for construction in order to make them, as I mentioned, more relevant to construction though it's going to take significant stakeholder input. We want to be aligned with the ROP as they address the Commission Safety Culture Statement, so this will also be done in parallel, but like I said, I don't think we're going to be doing anything major in this area until probably about a year from now. And that's based on what's going on in the Reactor Oversight Process. And I'd like again, I think that we do have a workable process in place now, we just want to improve it.

We'll eliminate the different types of inspection findings, that's key. We want to make sure we do that before we fully implement. And then make sure that our guidance manual chapter 2506 clearly describes how we're approaching vendors and suppliers

and contractors as they pertain to the licensee, and how we evaluate our findings.

The exit strategy for our pilot, as I've mentioned, we believe the new assessment and enforcement approach is sound. We don't have to make any changes to what we told the Commission we were going to do. We need to continue to learn and improve the processes, but the processes themselves I think apply to construction, we learned that.

We're going to leave the latest revisions of the pilot manual chapters in place until we come up with final manual chapters and final guidance. And the last bullet there, I think I have them a little bit out of order, we're shooting for getting the final guidance documents out by July 1st, incorporating all the feedback that I mentioned during this meeting.

MEMBER SKILLMAN: Let me ask what that means. Presently you have put a P in front of your three IMC chapters. Is the practical effect of the second bullet, at some point you will remove the P and the new non-P version supercedes what were the old versions?

MR. FRYE: Correct.

MR. KOZAK: Yes.

MEMBER SKILLMAN: Thank you, I understand.

MR. FRYE: Yes, exactly.

MR. KOZAK: Right.

MR. FRYE: And just to add on to the last bullet, our goal is to write up the paper, present it to the Commission, which is April, discuss it at the Agency Action Review Meeting, and then brief it at the Commission. So the Commission, although it's an information paper, the Commission would then have a chance to comment on the staff proposal. And assuming they don't, then we'll be ready for full implementation after the Commission brief.

MEMBER SKILLMAN: Thank you.

MR. KOZAK: Right, so going back up to the third bullet, we have one more Commissioner assistants' briefing that we're required by the SRM to complete by March 21st. We've briefed the Commissioners' assistants two or three times?

MR. FRYE: At least two.

MR. KOZAK: At least twice during the course of the pilot. And we do it every six months, so we'll have one more briefing to them. It will be similar to what we've presented to you today. And they've been very supportive of the program going forward so far. So I expect that, I don't expect anything different in the next briefing that we have

with them.

And of course, Tim just mentioned the Self Assessment Paper, all of these results will be incorporated into there, and that's required by the SRM that we received. And again, the Commission requested an information paper from us, and letting them know how the pilot went and what our plans are, any changes we need to make before full implementation. And that concludes what I was prepared to present to you today.

MEMBER SKILLMAN: Let me ask my colleagues if they have any comments. Joy?

MEMBER REMPE: No.

MEMBER SKILLMAN: Charlie? Bill? Mike? John? Sam?

CHAIR ARMIJO: Nothing.

MEMBER SKILLMAN: Harold?

MEMBER RAY: Nothing more than I said already.

MEMBER SKILLMAN: Dana? Dennis? Steve? Tom and Tim, thank you very much.

MR. FRYE: Okay, thank you for the chance to --

MEMBER SKILLMAN: Mr. Chairman, back to you, sir.

CHAIR ARMIJO: We didn't have anybody on bridge line or anything, as far as we know?

MR. FRYE: I hope not.

(Off microphone discussion)

CHAIR ARMIJO: Is the bridge line open?

MALE PARTICIPANT: Not to my knowledge.

CHAIR ARMIJO: We'll check just quickly and then we'll --

(Off microphone discussion)

CHAIR ARMIJO: If somebody's listened in and wanted to make a statement, I didn't want to cut them off. Nobody on? Okay, all right. Well thank you very much. We're ahead of schedule so we're going to recess the meeting now and the members are invited next door to our Caucus Room for coffee and cake to honor the birthday of Mr. Charles Brown.

(Off microphone discussion)

(Whereupon, the meeting in the above-mentioned matter was concluded at 2:42 p.m.)

Limerick Generating Station
License Renewal Application

ACRS Full Committee Presentation
February 07, 2013

Exelon®

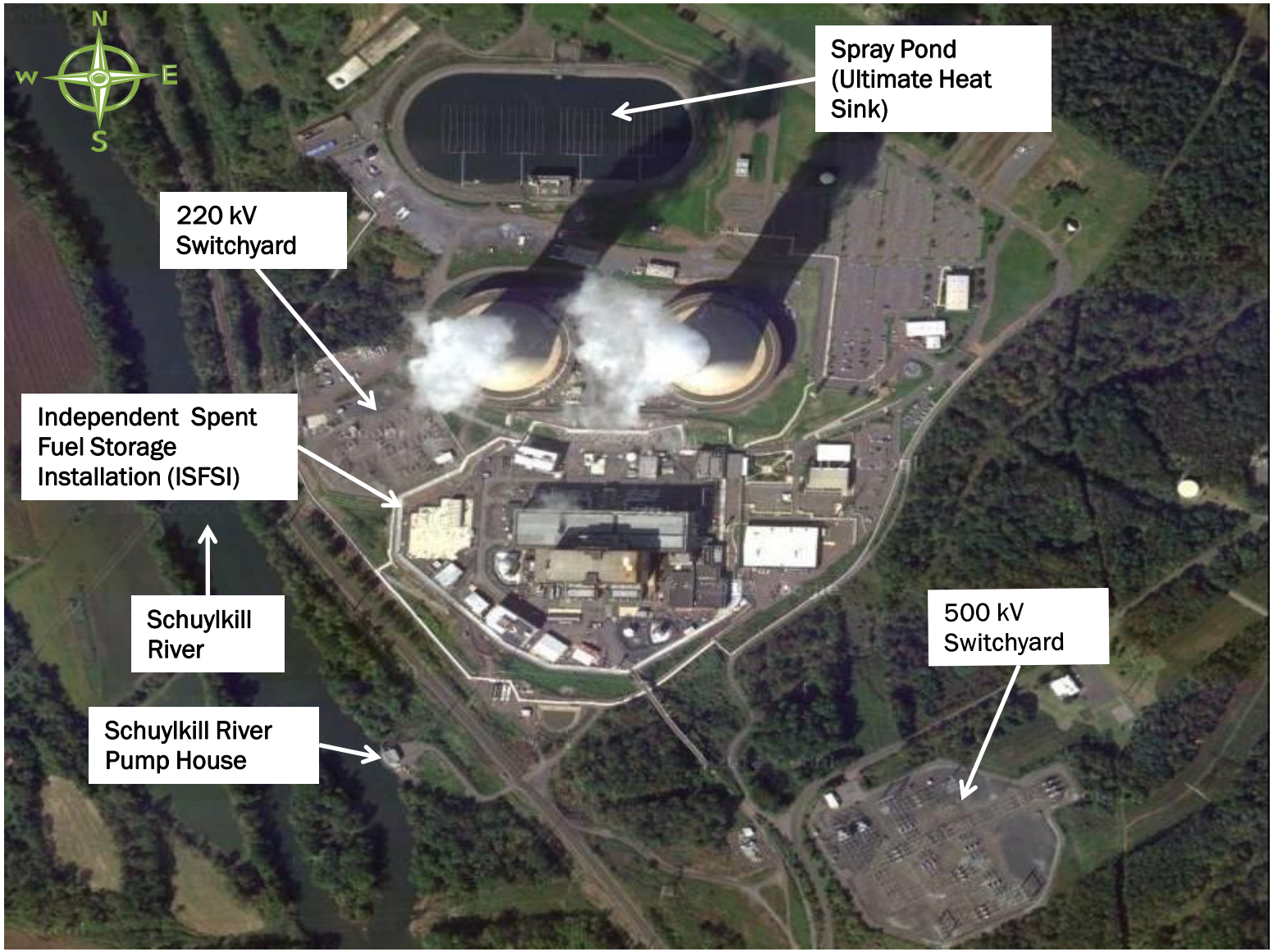
Introductions

- Mike Gallagher VP, Exelon License Renewal
- Gene Kelly License Renewal Manager
- Dan Doran Limerick Engineering Director
- Mark DiRado Limerick Engineering Programs Manager

Agenda

- Introductions — Mike Gallagher
- Site Description — Dan Doran
- Limerick Overview — Dan Doran
- GALL Consistency & Commitments — Gene Kelly
- SER Open Items
  - Operating Experience — Gene Kelly
  - Suppression Pool Liner — Mark DiRado
- Questions and Close — Mike Gallagher

Limerick Generating Station



Exelon

Limerick Overview

	Unit 1	Unit 2
Initially Licensed to 3293 MWt	10/26/84	6/22/89
5% Power Uprate to 3458 MWt	1/24/96	2/16/95
Turbine Rotor Replacements	1998	1999
Digital Feedwater Control	2004	2005
Independent Spent Fuel Storage Installation (ISFSI)	2007	2007
1.65% Measurement Uncertainty Recapture (MUR) 3515 MWt	4/8/11	4/8/11
Main Transformer replacements	2014	2011
Recirculation Pump Adjustable Speed Drive Units (ASD)	2012	2013
Next scheduled Refueling Outage	March 2014	March 2013
Current License Expiration	10/26/24	6/22/29

GALL Revision 2 Consistency and License Renewal Commitments

GALL Consistency and Commitments

- Submittal based on GALL Revision 2
- Aging Management Programs – 45
  - 34 existing and 11 new programs
  - One exception to GALL
- License Renewal Commitments
  - UFSAR Supplement (Appendix A of the LRA)
  - Managed by Exelon Commitment Tracking program based on Nuclear Energy Institute 99-04, "Guidelines for Managing NRC Commitment Changes“
  - Total of 47 Commitments
    - 45 associated with aging management programs
    - Operating Experience program enhancement
    - Unit 1 Recirculation Nozzle flaw re-evaluation

Open Items & Resolution

Open Item 3.05 -1 - Operating Experience

Open Item

- The staff needs additional information to determine whether operating experience will be considered in the period between issuance of the renewed licenses and implementation of the program enhancements

Resolution

- The Commitment and UFSAR Supplement have been revised to require that enhancements to the LGS Operating Experience program are implemented no later than the date that the renewed operating licenses are issued and are conducted on an ongoing basis throughout the terms of the renewed licenses.

Open Item 3.0.3.2.13-1 - Suppression Pool

Open Item:

- Prioritized approach to implementation of Coating Plan
- Methods for underwater examination
- Expected corrosion mechanism
- Requirements for augmented examination
- Downcomer recoat criteria

Resolution:

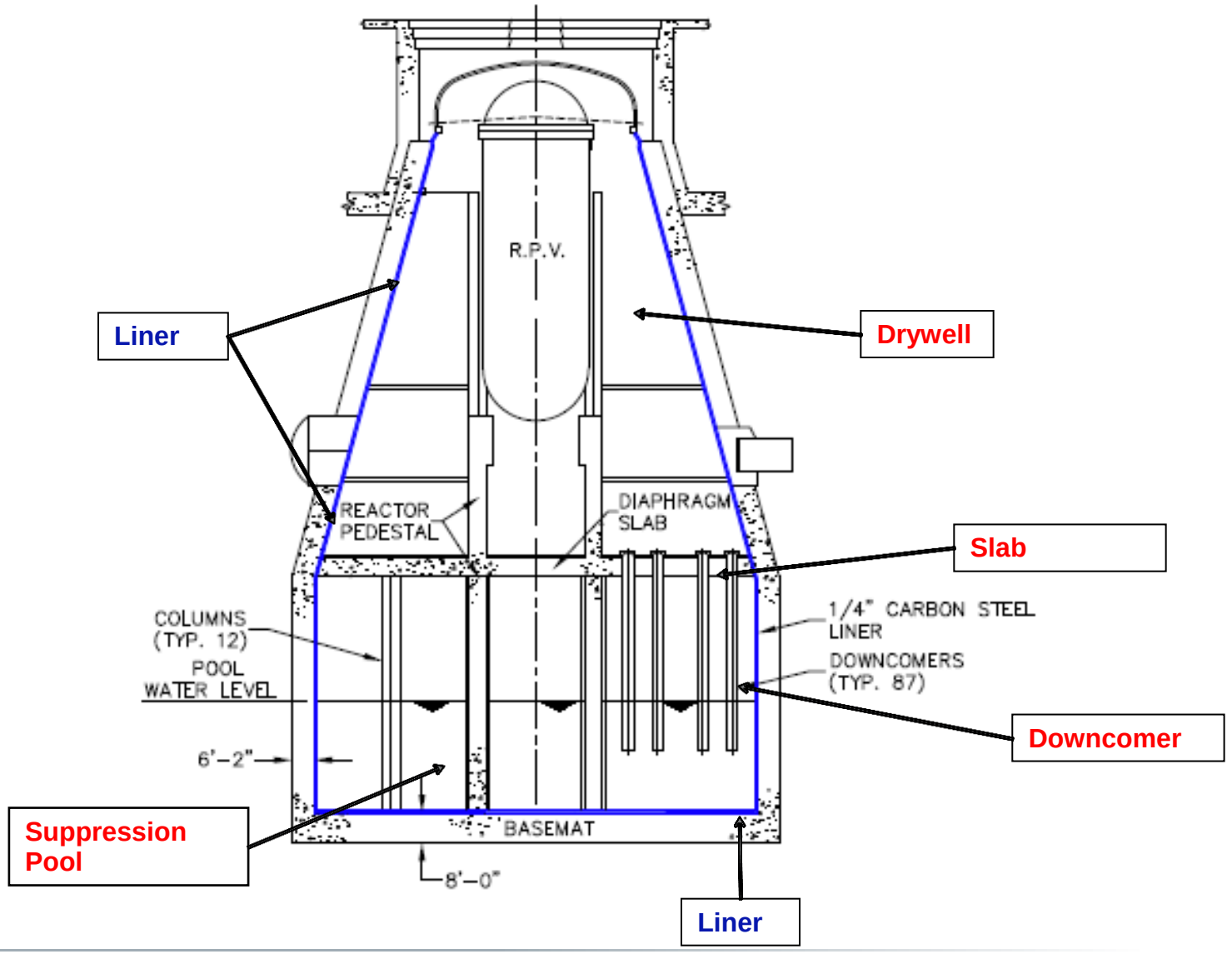
- Updated IWE Commitments to specify prioritized approach for Coating Maintenance Plan and conduct of ultrasonic exams
- Additional information provided on examination methods and corrosion mechanism
- Downcomer criteria added to UFSAR Supplement and IWE program procedures

Suppression Pool

Key Points

- Robust MARK II reinforced containment design
- 100% liner thickness margin
- Environment minimizes corrosion
  - Inerted atmosphere
  - Excellent water chemistry
  - Low corrosion rate
- Material condition well understood
- Enhancements to Aging Management Program initiated in 2012 well before PEO in 2024
- Suppression pool liner intended function will be maintained through PEO

MARK II Containment

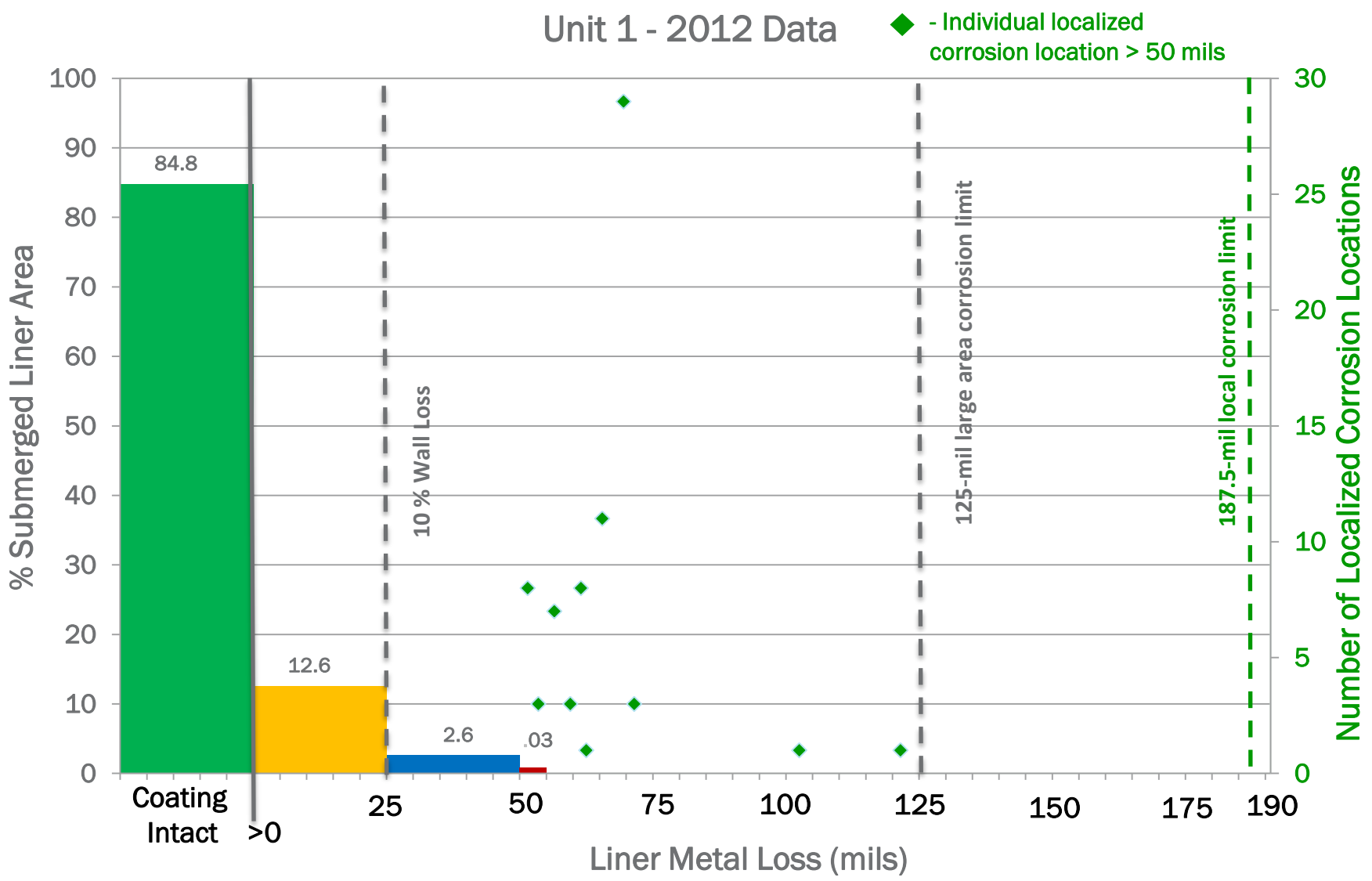


Exelon

MARK II Containment - Suppression Pool

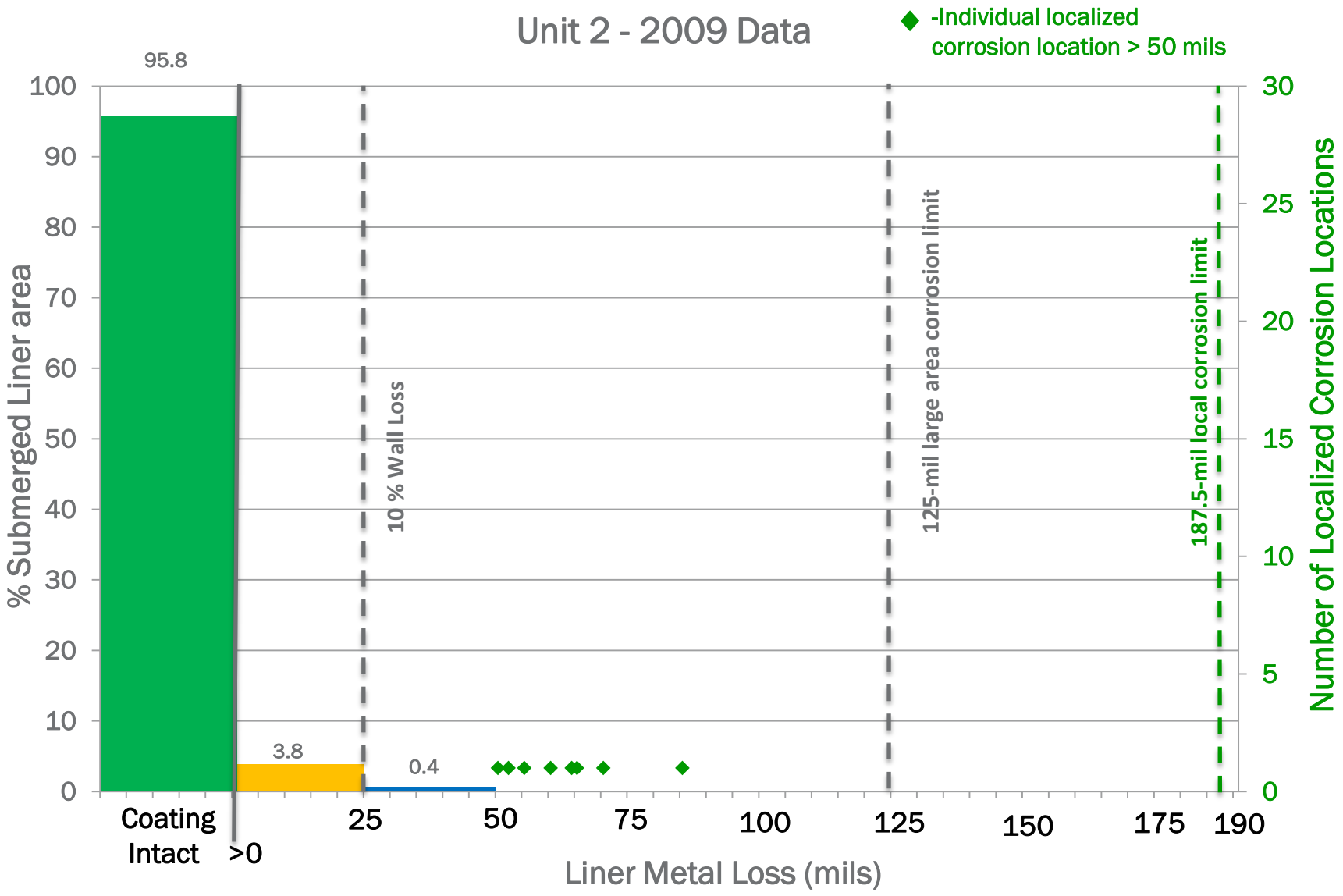
- 250-mil continuous carbon steel liner
- Liner structural integrity limits
  - 125 mils minimum large area thickness
  - 62.5 mils minimum local area thickness
- Service Level I inorganic zinc sacrificial coating
- Service life sustained by Coating Maintenance Plan
- Suppression pool water quality meets BWRVIP-190, “BWR Water Chemistry Guidelines”, EPRI 1016579
- General corrosion rate < 2 mils per year

Unit 1 Liner Condition



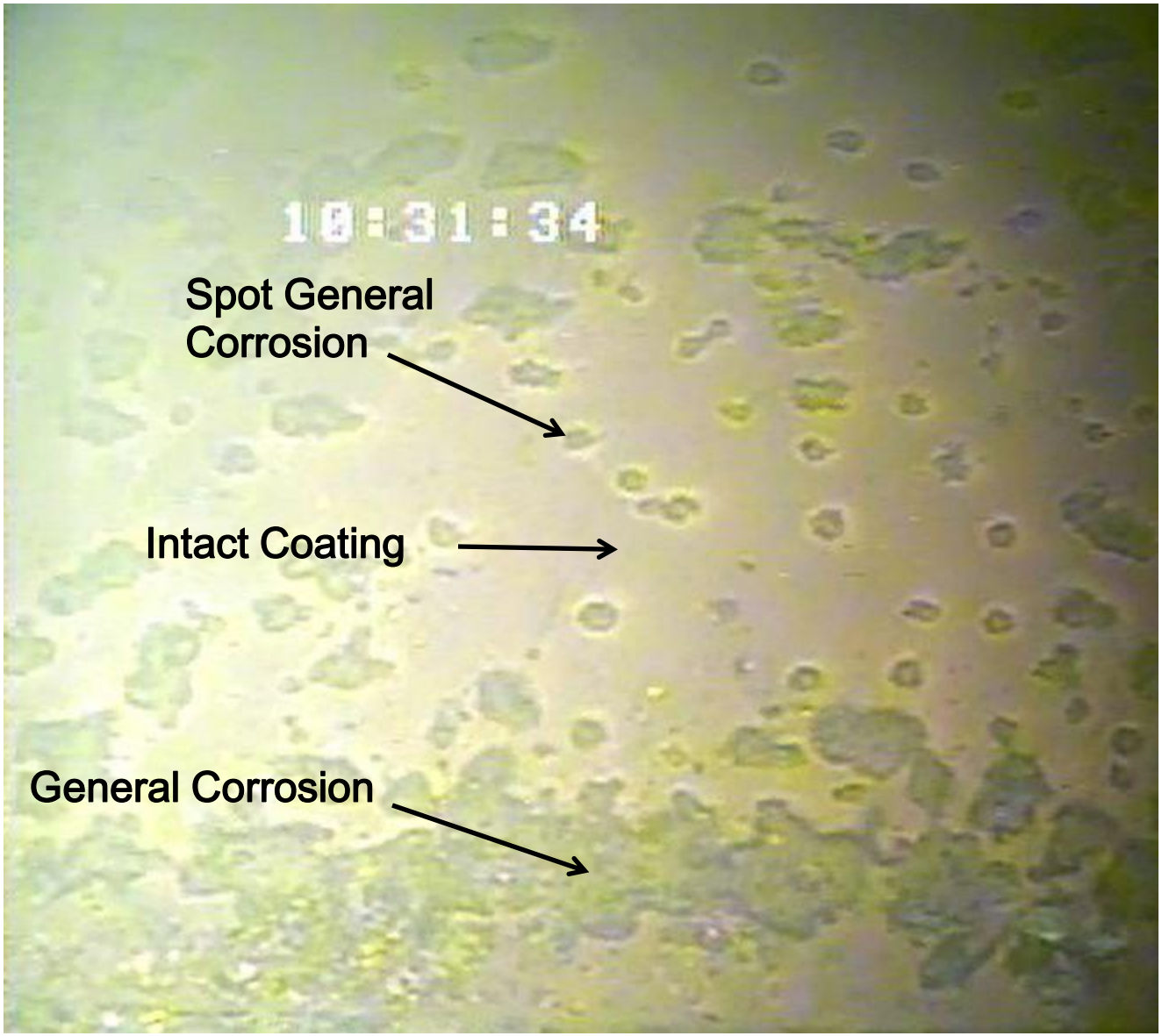
Exelon

Unit 2 Liner Condition



Exelon

Unit 1 Suppression Pool Plate



- Examination from Unit 1 2010 refueling outage
- Visible area approximately 1 ft^2

Exelon

Suppression Pool IWE Enhancements - Liner

- Remove accumulated sludge every refueling outage
- Perform ASME IWE examination of submerged portion each ISI period
- Perform ultrasonic thickness measurements on four areas of the liner affected by corrosion, whenever exams are conducted
- Implement the Coating Maintenance Plan for the submerged liner

Coating Maintenance Plan - Submerged Liner			
	Local Areas > 50 mils corrosion	Large Areas > 25 mils corrosion	Plates > 25% coating depletion
Augmented Inspection Criteria	X	X	
Prior to PEO	Recoat in the outage identified	Recoat by PEO based on ranking of affected surface area	Recoat by PEO based on ranking of affected surface depleted and metal thickness loss
During PEO	Recoat in the outage identified	Recoat in the outage identified	Recoat no later than the next scheduled inspection

Suppression Pool IWE Enhancements - Downcomers

- Local areas (< 5.5 inches) with 40 mils or more metal loss will be recoated
- Larger areas with 30 mils or more metal loss recoated
- Same criteria used to for augmented inspection
- Criteria documented in UFSAR Supplement
- No downcomers currently meet these criteria

Summary and Conclusions

- Robust MARK II reinforced containment design
- 100% liner thickness margin
- Environment minimizes corrosion
  - Inerted atmosphere
  - Excellent water chemistry
  - Low corrosion rate
- Material condition well understood
- Enhancements to Aging Management Program initiated in 2012 well before PEO in 2024
- Suppression pool liner intended function will be maintained through PEO

Closing Comments

Questions?

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Construction Reactor Oversight Process

Overview and Pilot Results

Jim Luehman

Office of New Reactors

Briefing for ACRS

February 7, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Construction Reactor Oversight Process

Overview and Pilot Results

- Construction Reactor Oversight Process (cROP) Overview — Mr. Timothy Frye
- cROP Pilot Results — Mr. Thomas Kozak

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Construction Reactor Oversight Process Overview

Timothy Frye
Construction Assessment and Enforcement Branch
Office of New Reactors
Division of Construction Inspection and Operational Programs
301-415-3900

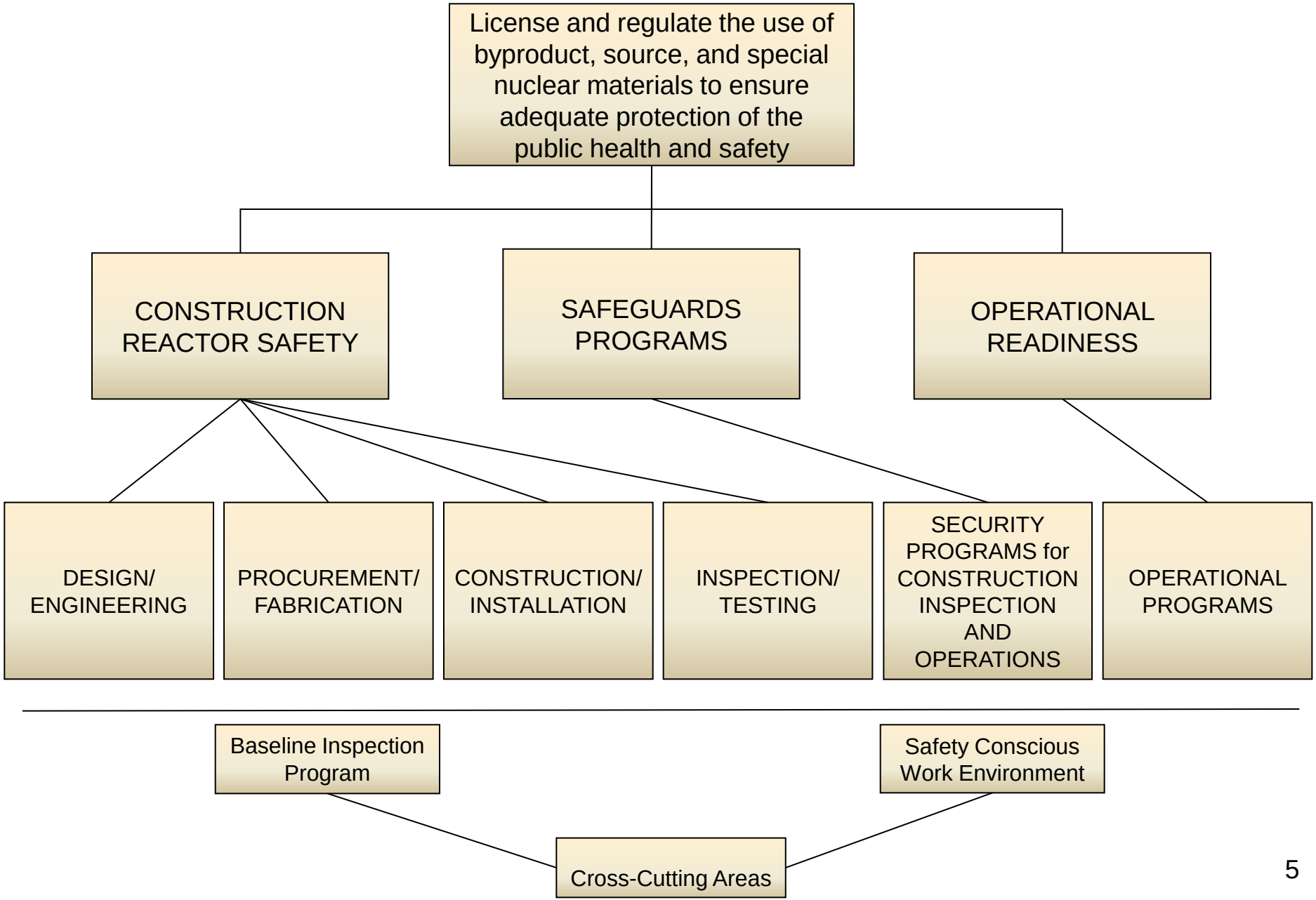
Briefing for ACRS
February 7, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

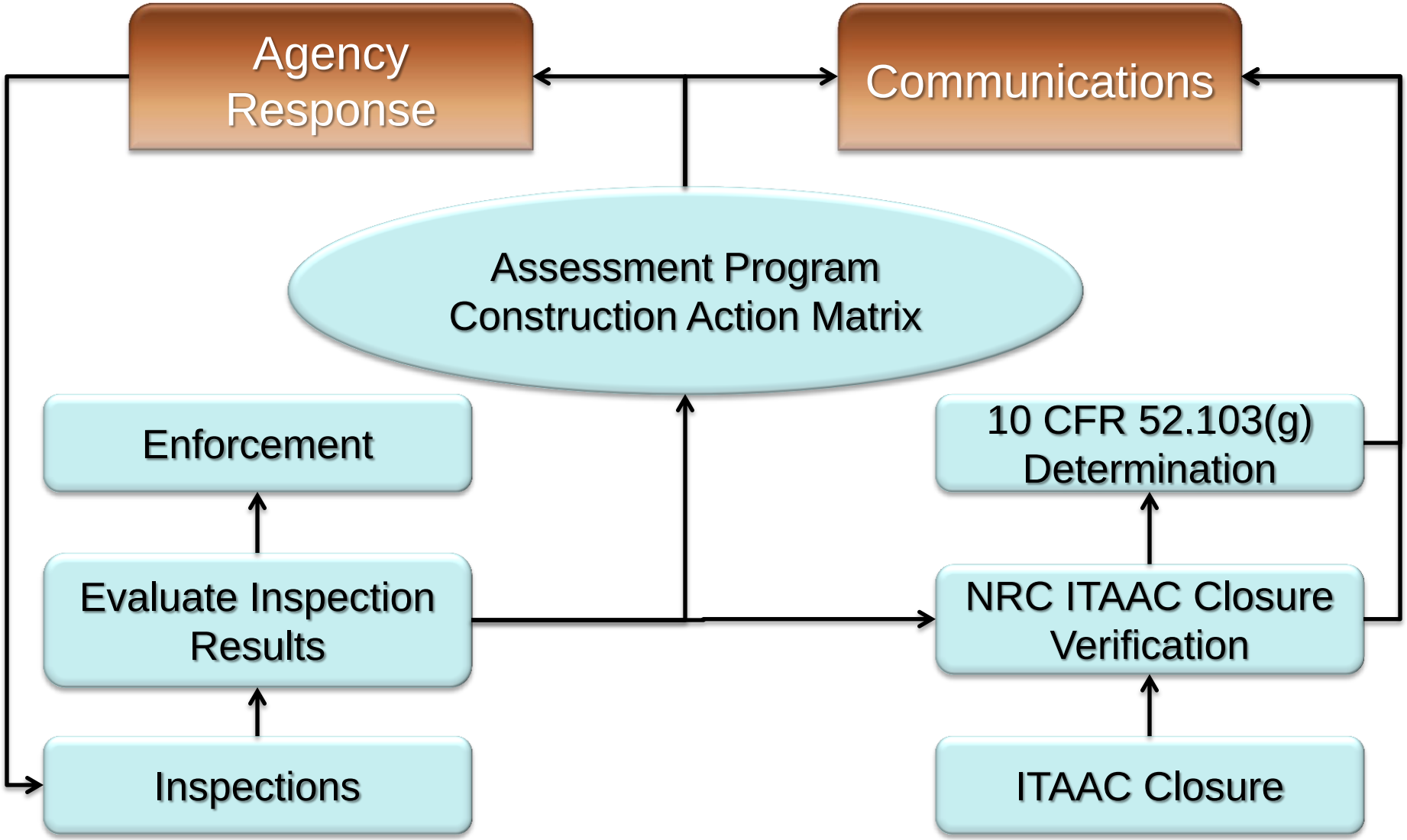
Background

- In Staff Requirements Memorandum SECY-10-0140, the Commission approved the staff's recommendation to develop a construction reactor oversight process that includes the following:
  - Regulatory Framework
  - Construction Significance Determination Process (SDP), and
  - Construction Action Matrix
  - Pilot new program for 1 year
- The Commission directed the staff to provide the pilot results to the ACRS for review.
- Due to the stage of Watts Bar Unit 2 construction, the new process is not applicable to this site.

cROP Regulatory Framework



cROP Overview



U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Construction Reactor Oversight Process Pilot Results

Thomas Kozak
Construction Assessment and Enforcement Branch
Office of New Reactors
Division of Construction Inspection and Operational Programs
301-415-6892

Briefing for ACRS
February 7, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

cROP Pilot

- Issued pilot guidance document including pilot purpose, scope, objectives, and evaluation and acceptance criteria

- Issued pilot versions of IMCs

  - IMC 0613P (Finding screening and report writing)
  - IMC 2505P (Performance Assessment)
  - IMC 2519P (Construction SDP)

- Trained staff in October and November, 2012

- Issued Enforcement Guidance Memorandum 11-06

- Implemented pilot at Vogtle on January 1, 2012; Implemented pilot at Summer upon issuance of combined licenses in March 2012

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

cROP Pilot

- To date, issued 7 Vogtle and 2 Summer inspection reports
  - 4th quarter inspection reports to be issued soon for Vogtle and Summer
- All findings identified to date were of very low safety significance (green)
  - 6 findings at Vogtle
  - 4 findings at Summer
- Conducted 1st quarter, mid-cycle, and 3rd quarter assessments for each unit

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

cROP Pilot

- **All units in licensee-response column of construction action matrix**
- **End-of-cycle assessment to be conducted in February and assessment letters to be issued in early March**
- **Public assessment meetings to be conducted in late March/early April near both sites**
- **Solicited stakeholder feedback**
  - **Internal and external surveys conducted through the end of CY 2012**
  - **Public meetings in vicinity of sites in early CY 2013**
- **Conducting a cROP self-assessment with results reported to the Commission via SECY paper in mid-April.**

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Initial Lessons-Learned Incorporated Into Guidance Documents

- Modified guidance for corrective action program effectiveness reviews
- Provided additional guidance for assessment letter contents
- Provided additional guidance for ITAAC finding documentation
- Added requirement to track licensee-identified violations that are material to ITAAC acceptance criteria
- Clarified role of vendor inspections in ITAAC verification
- Clarified the difference between vendors/suppliers and contractors working on behalf of licensees

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Evaluation of Pilot Program Results

- **The pilot program was evaluated using 11 metrics in 4 different areas**
  - **Risk-informed Baseline Inspection Program**
  - **Assessment**
  - **Enforcement**
  - **Information Management Systems and Staff Training**
- **All metrics were met.**

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Has there been sufficient activity during the pilot to end the pilot and fully implement the new construction assessment and enforcement approaches?

- **Consensus both externally and internally is that the pilot was a success and that enough activity occurred to show that the process is sound**

- **The staff should continue to engage stakeholders as lessons are learned and incorporated into the various cROP programs**

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

ADDITIONAL FEEDBACK

- **Clarify when a performance deficiency can be considered to affect a system/structure design function as used in the SDP**
- **A construction chapter of the enforcement manual should be developed.**
- **Cross-cutting aspects should be revisited for construction**

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Additional Feedback

- **There is confusion between the difference between the types of findings (i.e., ITAAC finding, ITAAC-related construction finding, construction finding, programmatic finding, technical finding).**

- **NRC should clarify statements in Vendor inspection reports where it states that if an issue identified is not corrected it might impact the ability for the NRC to meet the applicable ITAAC.**

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Key cROP Revisions to Support Full Implementation

- **Develop a construction chapter in the enforcement manual and revise the Enforcement Policy to reflect guidance in EGM 11-06 (will develop in parallel to implementation).**

- **Revisit cross-cutting aspects for construction**

  - **Interactions with stakeholders will be necessary**
  - **Align with ROP actions to address Commission Safety Culture Statement**

- **Eliminate different types of inspection findings**

- **Consider additional guidance as needed to better define roles and responsibilities of vendors/suppliers and contractors**

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Pilot Exit Strategy

- New assessment and enforcement approach is sound
- Latest revision of pilot guidance documents will remain in effect into 2013
- Commissioner Assistant's briefing prior to 3/21
- Results reported in cROP self-assessment SECY Paper in mid-April
- Goal is to incorporate feedback and issue final guidance documents by 7/1

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Construction Reactor Oversight Process Overview and Pilot Results

Jim Luehman

Office of New Reactors

Briefing for ACRS

February 7, 2013

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Large Component Fabrication and Vendor Inspection

James Luehman

Office of New Reactors

Briefing for ACRS

February 7, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Large Component Fabrication and Vendor Inspection

- Vendor Inspection Program — Mr. Edward Roach
  - Vendor Inspection Program Plan
  - Vendor Selection Methodology
  - Centers of Expertise
- Recent Inspection Findings / Trends — Mr. Richard McIntyre
- International Engagement / MDEP — Mr. Richard Rasmussen
- Large Component Inspection — Ms. Kerri Kavanagh

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Vendor Inspection Program

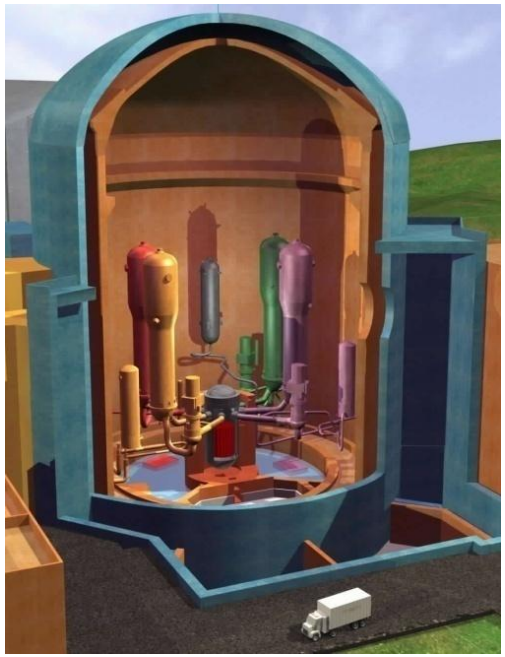
Edward Roach
Construction Mechanical Vendor Branch
Office of New Reactors
Division of Construction Inspection and Operational Programs
301-415-1973

Briefing for ACRS
February 7, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Overview

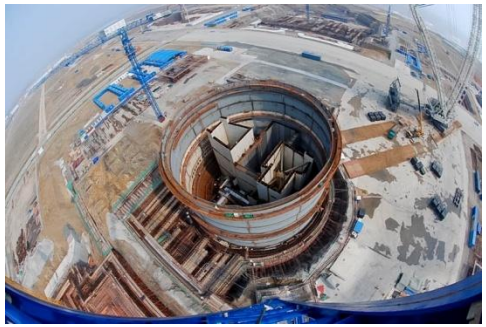
- New Reactors and the Construction Inspection Program
- Oversight of Vendors
  - Key Regulations and Guidance
  - Types of Inspections
  - Vendor Inspection Program Plan
  - Vendor Selection Criteria
- Centers of Expertise



U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

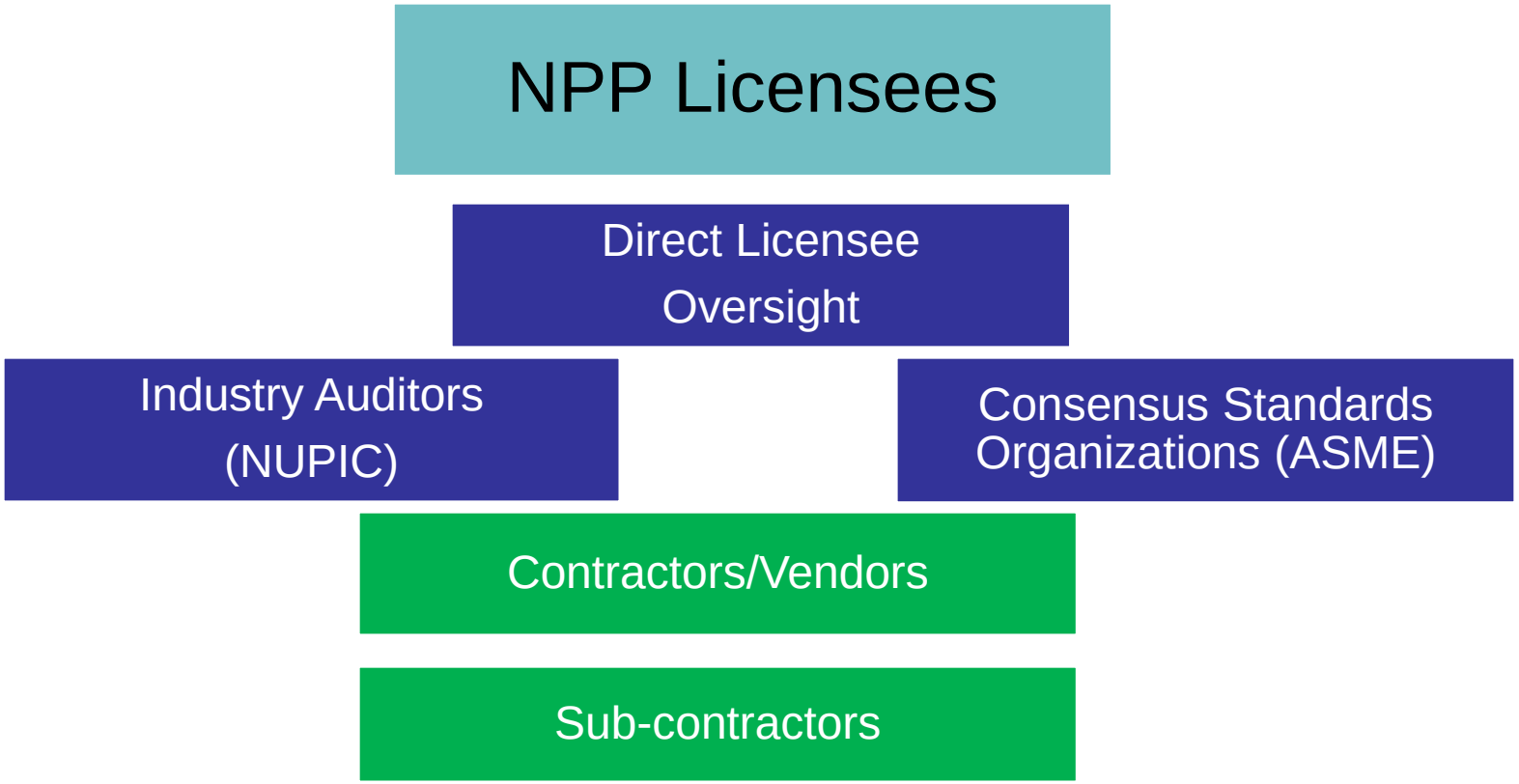
Construction Inspection Program

- Vendor Inspections
- QA Implementation Inspections
- Operational Program Inspections
- Inspections, Tests, Analyses, and Acceptance Criteria



U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Oversight of Vendors



- The ultimate responsibility lies with the licensees
- NRC verifies licensees meet their responsibilities

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Vendor Inspections

- Vendor inspection program for new reactors was established in 2007
- To verify effective implementation of
  - Appendix B to 10 CFR Part 50 (Quality Assurance requirements)
  - 10 CFR Part 21 (Reporting of Defects and Noncompliance)
- NRO conducted 24 inspections 2011
- NRO conducted 27 inspections in 2012
- NRO plans to conduct 30 inspections in 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Vendor Regulations

- Directly – NRC issues Violations
  - 10 CFR Part 21, “Reporting of Defects and Noncompliance”
  - 10 CFR 50.5, “Deliberate Misconduct”
  - 10 CFR 50.7, “Employee Protection”

- By Contract – NRC issues Nonconformances
  - Appendix B to 10 CFR Part 50, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants”

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Vendor Inspection Guidance

- Vendor Inspection Program Plan (VIPP)
- Inspection Manual Chapter (IMC) 2507, “Vendor Inspections”
  - Establishes the inspection program for vendors providing safety-related materials, equipment, and services in support of new reactor construction
  - Provides requirements and guidance to NRC inspectors for conducting inspections at vendor facilities.
  - Implemented through six inspection procedures

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Routine and Reactive Inspections

- **Routine** - Verify that vendors supplying basic components have implemented an effective QA program that complies with the requirements of Appendix B to 10 CFR Part 50.

- **Reactive** - In response to reported problems involving vendor-supplied products or services.

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Vendor Selection

- Safety significance of components and services
- Scope of components and services
- Construction Inspection Program insights related to ITAAC
- First-of-a-kind component fabrication
- Vendor experience with component fabrication
- Operating and construction experience
- Insights from international vendor oversight activities
- Insights from third party audit organizations
- Resources available based on licensing workload

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Centers of Expertise (COE)

- COE established within DCIP for vendor inspection
- Additional COEs established within NRO and NRR in the areas of:
  - Allegations
  - Operating Experience/Construction Experience (OpE/ConE)
  - Electrical engineering

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Centers of Expertise

The Vendor Inspection COE conducts inspections:

- To verify the effective implementation of vendor QA programs
- To assure the quality of materials, equipment, and services supplied to the commercial nuclear industry (both Part 50 & 52)
- To support the Allegations COE
- To lead efforts to address and deter the potential use of CFSI in safety-related applications

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Recent Inspection Findings and Trends

Richard McIntyre
Construction Mechanical Vendor Branch
Office of New Reactors
Division of Construction Inspection and Operational Programs
301-415-3215

Briefing for ACRS
February 7, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Outline

- Vendor Identification
- NRC Vendor Inspections
- Inspection Results

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Vendor Identification

Current Sources of Vendor Information

- Reporting systems: 10 CFR Part 21, 50.72, 50.73
- Industry and standards organizations
- Communication with licensees, applicants, and engineering, procurement, and construction (EPC) contractors
- Allegations

Initiatives

- RIS requesting voluntary identification
- NRC public web site
- NRC internal database

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Recent NRC Vendor Inspections

- Emphasis on inspection of in-process design, fabrication, testing and inspection of specific SSCs and product lines of interest
- “Vertical-Slice” approach as opposed to a broad programmatic review
- Increased use of technical specialists in areas of mechanical, materials, structural, electrical, digital I&C
- Emphasis on qualification and type testing and design work associated with Targeted ITAAC SSCs
- Increase inspection activity to a projected 30 inspections in 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

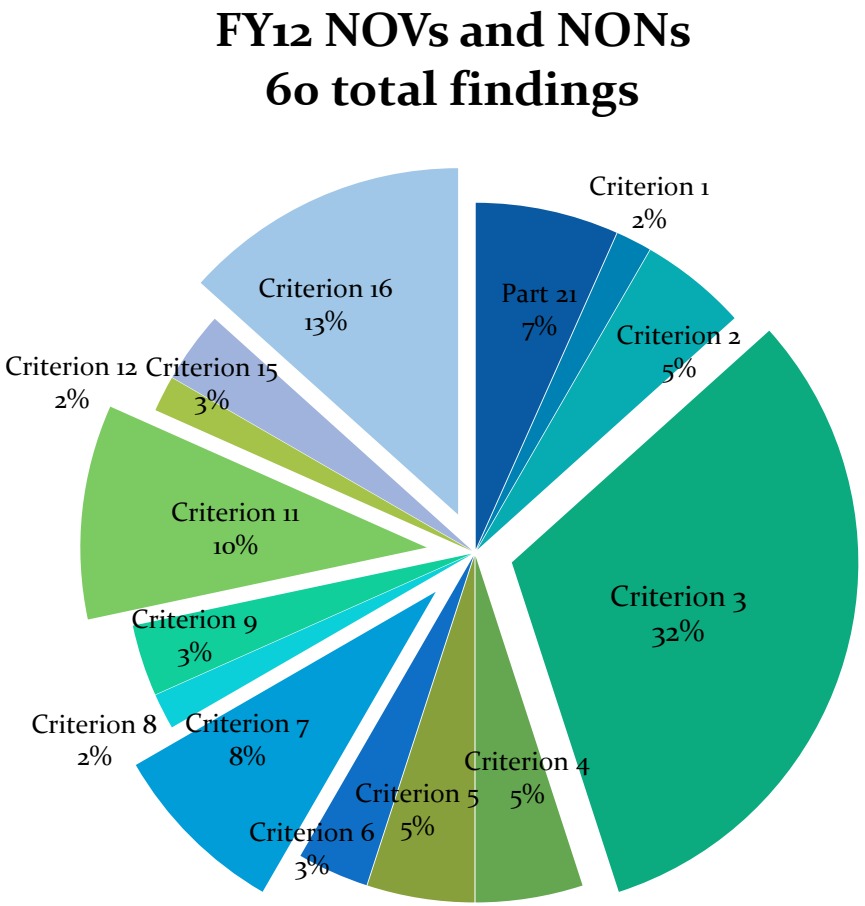
Recent Inspection Results

III - Design Control

VII - Control of Purchased Material, Equipment and Services

XI - Test Control

XVI - Corrective Actions



U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Typical Inspection Findings

- Compliance with 10 CFR Part 21 - Identification and Reporting of Defects and Noncompliance
- Failure to provide appropriate oversight of subcontractors
  - Subcontractors must implement 10 CFR Part 50, Appendix B Quality Assurance requirements
- Procedural adherence and documentation
- Commercial grade items not adequately dedicated
- Failure to meet design requirements
- Test Control - Configuration changes made without a technical assessment
- M&TE used outside of calibrated range

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Typical Inspection Findings (cont'd)

- Summary
  - Inadequate design control and CG dedication
  - Inadequate dedication of commercial software
  - Inadequate technical evaluations of conditions adverse to quality
  - Inadequate justification for substitution of materials of construction

- Challenges and Trends
  - Commercial Grade Dedication
  - Licensee and Supplier Oversight

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

International Engagement

MDEP Vendor Inspection Cooperation Working Group

Richard Rasmussen

Construction Electrical Vendor Branch

Office of New Reactors

Division of Construction Inspection and Operational Programs

301-415-1340

Briefing for ACRS

February 7, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

International Efforts Overview

- MDEP VICWG Objectives
- VICWG Inspection Activities
- Multinational Inspections

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

MDEP VICWG Objectives

- To facilitate the understanding and sharing of vendor inspection results
- To facilitate Joint and Multinational Inspections
- Harmonization of Quality Assurance requirements

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

VICWG Activities

- 2011
  - 7 witnessed inspections and 1 joint inspection were conducted
  - Observing countries gained additional information and added confidence in the inspection results
  - MDEP regulators are sharing inspection practices
- 2012
  - 7 witnessed inspections and 1 joint inspection completed
  - Multinational Inspections
    - Definition currently under development
    - Intent is to develop a multinational inspection team working to common requirements

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Joint Inspection Experience

- 2011: KINS Lead – Doosan Heavy Industries
- 2012: NRC Lead – Target Rock
- March 2013: NRC is planning to lead Qual Tech

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Multinational Inspections

- Assessment of Member Country Regulations
- Discussions with Standards Development Organizations (SDO's)
- Goal is harmonization of standards

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Large Component Inspection

Kerri Kavanagh
Quality Assurance Branch
Office of New Reactors
Division of Construction Inspection and Operational Programs
301-415-3743

Briefing for ACRS
February 7, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Large Component Inspection

- Vendor inspection renewed focus on large components with creation of the Office of New Reactors (2007)
- Direct technical vendor oversight
- Approximately 14 NSSS/heavy component inspections performed since 2007
- Global supply chain presents challenge of inspecting international vendors

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Babcock and Wilcox (foreign and domestic)

- *Components inspected:* Replacement reactor vessel heads (Palisades and Diablo Canyon)
- NRC Inspection Report Nos. 99900067/2007-201 (performed by NRR) ADAMS Accession No. ML072850014
- NRC Inspection Report Nos. 99900042/2008-201
- ADAMS Accession No. ML082680271

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Mitsubishi Heavy Industries

- *Components inspected:* Reactor Vessels, Steam Generators, and Reactor Internals
- NRC Inspection Report No. 99901030/2008-201
- ADAMS Accession No. ML081890043

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Doosan Heavy Industries

- *Components inspected:* Reactor pressure vessels, steam generators, and reactor internals for operating and AP1000 plants
- NRC Inspection Report No. 99901373/2008-201 ADAMS Accession No. ML081930582
- NRC Inspection Report No. 99901373/2009-201 ADAMS Accession No. ML091380474

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Japan Steel Works, LTD

- *Components inspected:* Large steel forgings and castings that are used for reactor pressure vessels, heads, and steam generators

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Japan Steel Works, LTD

- NRC Inspection Report No. 99901364/2009-201
- ADAMS Accession No. ML092290864

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Areva – Creusot Forge

- *Components inspected:* Reactor pressure vessel and EPR steam generator forgings
- NRC Inspection Report No. 99901381/2009-201
- ADAMS Accession No. ML092370387

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Sumitomo Metal Industries

- *Components inspected:* AP1000 and operating reactor steam generator tubes
- NRC Inspection Report No. 99901384/2009-201
- ADAMS Accession No. ML093070450

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Sandvik Material Technology

- *Components inspected:* EPR steam generator tubes
- NRC Inspection Report No. 99901326/2010-201
- ADAMS Accession No. ML101940246

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Mangiarotti S.p.A.

- *Components inspected:* AP1000 pressurizers and passive residual heat removal exchangers
- NRC Inspection Report Nos. 99901393/2010-201 and 99901416/2012-201
- ADAMS Accession Nos. ML102600433 and ML 12320A661

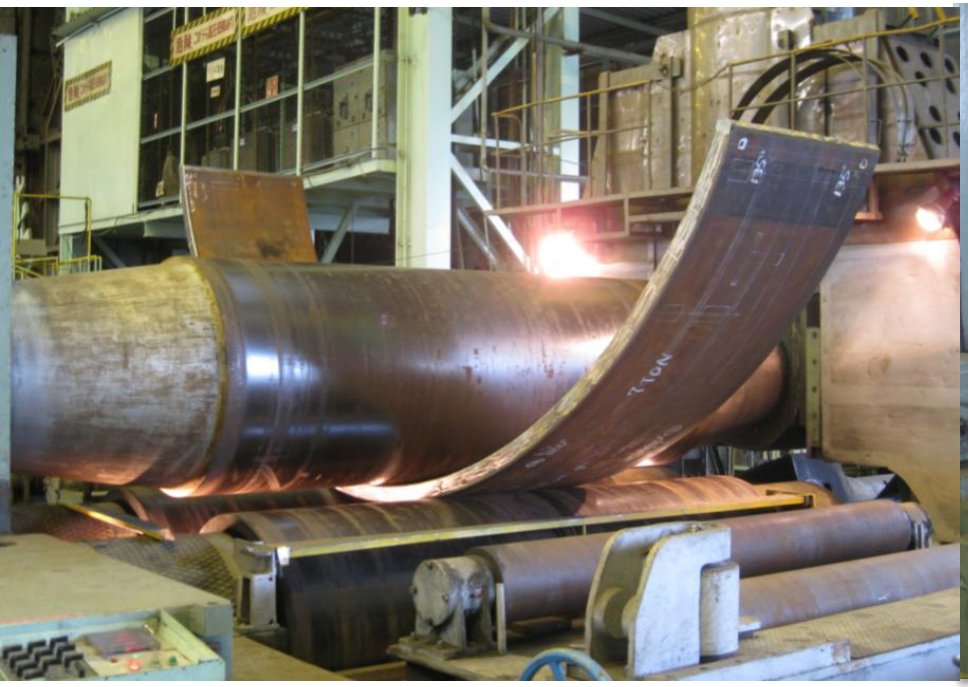
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

IHI Corporation

- *Components inspected:* AP1000 containment vessel and ABWR reactor pressure vessel
- NRC Inspection Report No. 99901395/2010-201
- ADAMS Accession No. ML102870167

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

IHI Corporation



- *Components inspected:* AP1000 containment vessel and ABWR reactor pressure vessel

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Westinghouse Electric Company (Newington, NH)

- *Components inspected:* AP1000 control rod drive mechanisms and reactor vessel internals
- NRC Inspection Report No. 99901392/2011-201
- ADAMS Accession No. ML112144266

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

SPX Copes-Vulcan

- *Components inspected*:
  AP1000 squib valves
- NRC Inspection Report No. 99900080/2012-201
- ADAMS Accession No. ML12158A154

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Advisory Committee on Reactor Safeguards
Full Committee Meeting

Safety Evaluation Report Regarding License Renewal for Limerick Generating Station, Units 1 and 2

February 7, 2013

Patrick Milano, Project Manager
Office of Nuclear Reactor Regulation

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Presentation Outline

- Overview
- Closure of Open Items
  - Operating Experience
  - Suppression Pool Liner and Downcomer Corrosion
- Conclusion

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Overview

- Safety Evaluation Report (SER) with Open Items was issued July 30, 2012
- ACRS License Renewal Subcommittee Meeting on September 5, 2012
- The Open Items for the SER are closed
- Final SER was issued January 10, 2013

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Overview

- Follow-on Planning
  - Commission Memorandum and Order, CLI-12-16
    - No licenses issued pending decision on waste confidence rule
  - License Renewal - Interim Staff Guidance Incorporation
    - Address in annual updates to LR application
  - Final ACRS Decision
    - Staff to provide documents related to issues arising after the receipt of an ACRS decision
    - Staff to describe changes/supplements to SER findings
    - Staff will inform ACRS on changes about 3-4 months prior to expected LR issuance date
    - Pending ACRS desire to discuss changes, staff would request the ACRS decision to be finalized

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

SER Section 3 Closure of Open Items

SER Section 3.0.5 – Operating Experience for Aging Management Programs

- **Issue:** Whether applicant would fully consider age-related operating experience between issuance of renewed license and implementation of Operating Experience program enhancements
- **Applicant Response:** Program enhancements will be implemented no later than renewed license issuance and enhanced operating experience review activities will be conducted on ongoing basis throughout terms of renewed licenses
- **Staff Finding:** Implementation of Operating Experience program enhancements ensures that applicant fully considers all available information to inform the aging management activities on an ongoing basis

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

SER Section 3 Closure of Open Items

SER Section 3.0.3.2.13-1 ASME XI, Subsection IWE

- **Issues:**
  - Frequency and methods of inspection, and criteria for recoating the liner
  - Schedule for implementing coating maintenance plan.
  - Acceptance criteria for downcomers degradation not in AMP or procedures
- **Applicant Response:**
  - Enhanced AMP to increase the frequency of inspection of suppression pool liner and sludge removal
  - Committed to Implement more stringent acceptance criteria for recoating and repair of liner plate
  - Committed to perform UT examination of liner plate to complement liner plate thickness measured by depth gauges
  - Committed to implement a coating maintenance plan to locally recoat the liner based on the new criteria
  - Enhanced acceptance criteria for augmented examination and recoating of downcomers

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

SER Section 3 Closure of Open Items

Section 3.0.3.2.13-1 ASME XI, Subsection IWE (Con't)

Staff Finding:

- Enhancements to the AMP are acceptable because:
  - Applicant committed to perform an ASME IWE examination of the submerged portion of the suppression pool during each ISI period or at a maximum interval of four years (two refueling outages).
  - The maximum 4-year inspection interval is sufficiently short to identify local (pitting) corrosion prior to challenging the structural integrity and leak tightness of the liner.
  - Applicant plans to recoat all local areas (less than 2.5 inches in diameter) of corrosion (pitting corrosion) with greater than 50 mils plate thickness loss in the outage identified.
  - Applicant is committed to perform UT examination of liner plate to correlate with results of visual examinations.
  - Enhanced acceptance and recoating criteria for downcomers will ensure that structural integrity of the downcomers will be maintained during the PEO.

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Conclusion

On the basis of its review to date, the staff determines that the requirements of 10 CFR 54.29(a) have been met for the license renewal of Limerick Generating Station, Units 1 and 2