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UNITED STATES NUCLEAR REGULATORY COMMISSION'S

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

July 24, 2008

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ACRS Visit to Region III U.S. NRC Conference

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RE: JOINT PLANT OPERATIONS

AND FIRE PROTECTION

THURSDAY, JULY 24, 2008

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801 WARRENVILLE ROAD

LISLE, ILLINOIS

+ + + + +

8:30 a.m.

PRESENT:

ACRS:

JOHN SIEBER

MAITRI BANERJEE

DENNIS BLEY

HAROLD RAY

SAID ABDEL-KHALIK

OTTO MAYNARD

CHARLES BROWN

JOHN STETKAR

WILLIAM SHACK

SAM ARMIJO

ACRS (CONT.)

SANJOY BANERJEE

MICHAEL CORRADINI

MICHAEL RYAN

FRANK GILLESPIE

CHRISTINA ANTONESCU

MICHAEL BENSON

REGION III:

MARK SATORIUS

JAMES CALDWELL

CYNTHIA PEDERSON

STEVE WEST

TOM KOZAK

JEFF FOLTZ

SARAH BAKHSH

GREG ROACH

RICK SKOKOWSKI

MEL HOLMBERG

LAURA KOZAK

STUART SHELDON

P R O C E E D I N G S

(8:30 A.M.)

MR. SIEBER: Advisory Committee on Reactor Safeguards Subcommittee on Plant Operations. My name is Jack Sieber, I'm Chairman of the Subcommittee. And just by way of introduction, my experiences have been in the area of plant operations. I'm responsible for license renewal, power up-rates, fire protection, things like that, on the ACRS and I've been there nine years. At the end of my introductory talk, I'm going to ask the members to introduce themselves and give us a sentence or two about their background and expertise.

The purpose of the meeting today is to discuss regional inspection and operational activities. The subcommittee will hold discussions with representatives of the NRC staff regarding these matters. The objective is to gather information, analyze relevant issues and facts, and formulate proposed positions and future actions as appropriate for deliberation by the full committee. And today, of the 15 full committee members, we have 12. So, you almost have the full committee right now.

Maitri Banerjee is the designated federal official for this meeting. The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register on July 10th, 2008. A transcript of the meeting is being kept and will be made available as stated in the Federal Register notice. It is requested that speakers first identify themselves and speak with sufficient clarity and volume so that they can be readily heard.

I see that we probably have a shortage of microphones, so if you want, members, if you want to ask a question, you can have this one here. And for the benefit of the court reporter, it would be good if you would state your name when you ask questions and say that you're from the ACRS so that we can make sure that the record is correct.

On behalf of the ACRS, I appreciate the efforts that Region III and the licensee that we visited yesterday, which was Exelon at Braidwood, have put so much energy into our visit. I've been here several times before, both on the ACRS and as a licensee representative. And I know that today's meeting will be very worthwhile for the full

committee.

What I'd like to do now is to have the members introduce themselves and give a sentence or two about their areas of expertise. And I'd like to start with Dennis Bley.

MR. BLEY: Hi, good morning. I'm Dennis Bley. I've been on the committee since last fall. I had some operating experience but that was a long time ago in the nuclear navy. I'm a nuclear engineer and an electrical engineer. And for the past 35 years, I've been involved in probabilistic risk assessment with the nuclear industry and some others as well.

MR. RAY: I'm Harold Ray. I just became a member this year. I was for 20 years a chief nuclear officer at a licensed facility out in California. Before that, I did serve some time with the Atomic Energy Commission as a reactor engineer.

MR. ABDEL-KHALIK: I'm Said Abdel-Khalik. I'm a professor of nuclear engineering at Georgia Tech. I've been on the committee for two years. My area of expertise is thermo-hydraulics.

(Brief discussion about microphones.)

MR. MAYNARD: I'll try and then we'll

see. My name is Otto Maynard. I've been on the ACRS for about two and a half years. Prior to that, I retired from Wolf Creek Nuclear Operating Corporation where I was the CEO and also an SRO licensee in the operating division.

MR. BROWN: I'm Charlie Brown. I am a newbie, sworn in just in May so this is my third month. My experience is 35 years in the naval nuclear program which, all of it was in the reactor implementation control protection system and the electrical, reactor electrical systems. I've been consulting with the navy for the last eight years when I retired. And I have 22 years doing digital implementation control for the naval consulting prior to my retirement.

MR. STETKAR: My name is John Stetkar. I've been on the committee since September of last year, so I'm relatively new also. I'm currently a consultant primarily in the area of risk assessment, probabilistic risk assessment. I have a background in also electrical engineering, and in a previous life I was a licensed shift supervisor at the Zion Station actually. I'm familiar with the area here anyway.

MR. SHACK: I'm Bill Shack. I have been

on the committee for 15 years. I've worked for 33 years at Argonne National Lab, retired last year and I'm interested in materials --

MR. ARMINO: I'm Sam Armijo. I've been on the committee a little over two years. I retired from General Electric about ten years ago where I was responsible for the nuclear fuel business. My background experience technically is in materials, water chemistry, nuclear fuels and advanced reactor systems.

MR. BANERJEE: I'm Sanjoy Banerjee. I'm a professor at the City University of New York. I was previously for 30 years with the University of California. I've been on the committee for about two years, a little bit more, a consultant for five before. And I'm interested primarily in thermal hydraulic --

MR. CORRADINI: My name is Mike Corradini. I'm with UW Madison just north of here, again nuclear engineering, chair of the department. I've been on the committee for two years. My area is multi-phase flow and reactor safety.

MR. RYAN: Good morning. I'm Michael Ryan. I'm the newest member of the ACRS. I previously served on the Advisory Committee on

Nuclear Waste & Materials since 2002 and three years as chairman of the committee. My area of interest is health physics, environmental performance, environmental monitoring, and radioactive waste management.

MR. GILLESPIE: Hi, Jim.

MR. CALDWELL: Frank.

MR. GILLESPIE: That's it. You know who I am.

MS. ANTONESCU: I'm Christina Antonescu. I'm an ACRS staff engineer and I support the -- of the committee.

MR. BENSON: I'm Michael Benson, I'm a staff engineer with ACRS and I'm interested in --

MR. CALDWELL: Frank thinks because he's retired that he's not --

MR. GILLESPIE: Well, no, it's just that everyone already --

MS. BANERJEE: I'm Maitri Banerjee. I'm a senior staff engineer for ACRS and I support the operations of the committee.

MR. CALDWELL: Okay. I'll let the folks introduce themselves up here.

MR. SATORIUS: Mark Satorius, I'm the Deputy Regional Administrator here in Region III.

I've been in Region III about three and a half years; before that, Region IV for a year or so; and then, headquarters for about ten years.

MS. PEDERSON: Good morning. I'm Cindy Pederson. I'm Director of Division of Reactor Projects. And I have been 20 plus years here with Region III and have managed all three of the technical divisions. Prior to that, earlier on I was resident inspector.

MR. WEST: I'm Steven West. I'm the Director of Division of Reactor Safety here in Region III. I spent about 22 or so years in headquarters in NRR working in the areas of fire protection, license renewal, risk informed initiatives, a bunch of other things, and came here to Region III about three years ago, started in Division of Reactor Projects where Cindy is, and I'm now in Division of Reactor Safety the last year or so.

MR. CALDWELL: We have a couple of people in the audience. Tom has been coordinating, Tom Kozak is our lead for the tech support services team. So, thank him, he set all this up. So, we appreciate that. And Julio and Dave Hills, if you'd introduce yourselves.

MR. LARA: Good morning. My name is Julio Lara. I'm one of the engineering branch chiefs here in the Division of Reactor Safety, primarily responsible for electrical systems and fire protection.

MR. HILLS: And my name is Dave Hills. I'm also an engineering branch chief in the Division of Reactor Safety in Region III, primarily responsible for structural materials and engineering division. I've been with the agency and Region III about 24 years.

MR. CALDWELL: Well, good morning. I appreciate you guys going all the way out here to Chicago and I hope your visit to Byron yesterday -- I mean Braidwood. I get them mixed up. Just listening to all the expertise in this room, I'm sure the agency has a lot of jobs open right now, especially in all these fields.

I do welcome you to Region III and I hope today you will, the one message I want you to get of today is that folks here take a lot of pride in focusing on our mission, the public safety mission. That's our primary focus. But we are also focused on ourselves and the relationship in the environment here in the Region. And we want people

to be proud of what they do because what they do is important, and we want to have an environment here that they enjoy as well coming to work. That is something important in enjoying what they do.

And if you see the mission and vision, our vision is on the, you have it in your book, but the vision is focused on, the tag on is safety plus inclusion plus infrastructure. Basically, our focus is on safety. Inclusion is the part that we talk about the environment and how we treat each other and the focus on the environment and the Region itself. And infrastructure is making sure we have the procedures and processes and all the tools necessary to be able to do our job. So, these are our focus areas.

I know you've seen the agenda. We have talked for days on what we do in this Region, so, and we only have today so we're going to try to hit the highlights and hopefully we'll be able to answer any questions that you have about the things that we're doing here. Again, we're very proud of what we do in this Region. We're very focused on what we do. And I believe we've been very successful.

I've been in this Region for, well, I've been in the agency for 24 years and the federal

government for almost 32 years. And I've been in this Region for about 13 years. So, I was in the Materials Group for a while and then Division of Reactor Projects, the FDRA and RA. And this is the longest place I've ever lived since I was in high school.

So, we have a lot of good people here and hopefully the message to get across today is what we're focusing on, and that's public safety. So, I'll turn it over to Mark Satorius. Mark is going to talk about organization and knowledge management project.

MR. SATORIUS: I'd like to take a few minutes to just familiarize you with how a region is put together. I know that you travel on to a different region each year and there are a lot of changes. But I think it's worth spending a few minutes just to compare and contrast our region together with the other regions because there are some small differences, especially with Region II having all new facilities as well having the construction in the new building, a focus that Region II has.

And also, I'm going to touch on knowledge management as reflected in some of the

initiatives that we've taken here within Region III. And also, give you some demonstrations in showing you some of the things that we're doing here at Region III that you may not see in other regions.

Just real briefly, this is the geographical area that constitutes NRC's Region III. We're in Chicago which is fairly centrally located. We have 16 reactor facilities that we regulate. And Missouri is kind of an interesting thing to show here as part of our region which it is from a materials standpoint. Missouri, Michigan and Indiana are the states that are not agreement states, meaning those are states that we license and inspect the licensees from a material perspective in those three states.

About like eight or ten years ago, Region V was collapsed into Region IV. There was some movement of responsibility for reactor plants. Callaway which was then traditionally a Region III reactor facility was moved to Region IV which made a lot of sense because Wolf Creek and Callaway are carbon copies except it's 180 degrees out in the other one if I remember right. And also, there were some tradeoffs done with Region II to kind of equalize the reactor program. So, Missouri is our

state from a materials perspective.

This our basic regional layout and organization. And this is, like I said, pretty much standard throughout the whole regions with the exception that Region II does not have a Division of Nuclear Materials Safety. Those non-agreement states in the traditional Region II area are covered by Region I. So, Region I's materials covers essentially the entire East Coast of the United States.

Region II though does have a separate division and I don't know the acronym, but it's a division that has oversight for the fuel cycle, both the facilities at Honeywell which is in Southern Illinois as well as Paducah which is in Kentucky, and also fuel fabrication which is located in several places throughout the country. And then also, in addition to the four line divisions, three of which called technical divisions and the other one is our resource management division. We also have some folks that report directly to the Regional Administrator's office so he is like our state liaison officer who works closely with the state and also other members in the federal family which is EVA during an incident response and other normal

activities. Also, regional counsel and all the regions have an enforcement staff that coordinates enforcement activities and investigatory activities within the region's purview.

And I think as we're going through my presentation, if you have any questions, it might just be, just go ahead and ask them as we're going through because I'm going to cover several different topics. It would probably be better if you have a question just to go ahead and ask it as I'm going through my presentation.

I'm not going to go into a lot of detail into the Division of Reactor Projects or the Division of Reactor Safety because Cindy and Steve are going to have a presentation shortly after mine. So, they'll cover that in a little bit more depth. But I will just point out that we have six branches in DRP and you can see the division of plants down there. Those are done either, for several different reasons. Davis-Besse and Perry happen to be both First Energy plants, so the count of licensee with Branch 1, Clinton, Dresden and Quad Cities are all Exelon plants and all BWR. So, we'll group them typically based on licensees and a lot of times in triple S interest.

We do alter this and have in the past. When I first came to Region III about three and a half years ago, at that time we had two plants, Point Beach and Perry, that were accounted for in the action matrix. And as all you folks are aware, those are plants that are in your heightened awareness. There's an increased inspection activity to take place at those facilities. So, we have in the past, and I believe when I was in Region IV we did the same with Cooper, and we're doing the same currently with Palo Verde, that these plants, we've carved them off into a separate branch where we have a branch chief that is closely associated with that plant and that individual plan, the inspections and the recovery phase for that licensee as they undertake initiatives to improve their performance and work themselves out of column 4 in the action matrix to the left.

So, we are flexible which means that somebody will, some branch chief will end up with four plants for a period of time so that he can free up a body to provide individual focus.

MR. CORRADINI: I just had a question about the organization. I was looking at this, so we tend to put boilers together with P's? Or how do

you arrange it? Is it more technology or just geographical? Because I notice Beach and Kewaunee are together but yet now they are two different owners but there are two BWR's. How do you --

MR. SATORIUS: Well, and that arrangement, they used to both be in NMC.

MR. CORRADINI: Right.

MR. SATORIUS: And with that break apart, they're both two -- they're close so that the resident inspectors, you know, they would share resources back and forth somewhat anyhow, so it just, we left it like that.

MR. CORRADINI: So, it tends to be geographical more than anything else?

MR. SATORIUS: Well, it tends to be a little bit of everything. It tends to, it's kind of a mix.

MR. CORRADINI: Oh, I'm sorry, I should identify myself. Corradini, ACRS. Sorry.

MR. SATORIUS: So, it's kind of a little of both. If we can do it and it works geographically and it just so happens like the Davis-Besse and Perry, that's sort of geographic and besides they're First Energy so that makes sense. So, I hope I answered your question.

MR. CORRADINI: No, you did. You did. I just was trying to understand, the way you mentioned it, I would understand if people went with the plants -- into an action into some similar state of awareness and inspection they would move, but it sounds like it can be partly technology, partly geographic.

MR. SATORIUS: That's correct. And real quickly, I'll touch upon the technical support staff which Tom Kozak was introduced as the lead for that organization. They do a lot of the operating experience activities. They do a lot of the metric reviews to make sure that we're getting our reports done on time, that the quality is high, things such as that.

The Division of Reactor Safety, you can see, you know, we don't get real creative with the way we describe our engineering branch. It's Branch 1, 2 and 3, but that's done for a reason. It's because of inconsistency amongst the regions because at one point in time the DRS organizations didn't look a lot alike. They all performed the same activities from an inspection perspective, but it's nothing like congruity.

So, we made them similarly but they have

different focuses, like Dave Hills mentioned, one of their focus is mechanical engineering. They do a lot of the structural material and from an ROP perspective, they do a lot of the in-service inspection type of reviews of licensees, outage type inspections. And also, they'll do the modifications and 5059 inspections which are one of our larger inspections.

Branch 2 also focuses on mechanical engineering, but they focus more on, I guess the best way to describe it is Branch 2 is the core branch for the largest inspection that we perform which is the CDBI which is now a triennial inspection. And it's a three-week long inspection, it's a very comprehensive inspection of an engineer's license for engineering mobilization.

And then, Branch 3 focuses on fire protection, new reactors and electrical. And their focus is primarily the triennial department inspection. That's the largest key inspection that they're responsible for.

And then, Operations and the two Plants were organizations that support security and breach protection emergency response. And we've been very fortunate here in Region III, we have three senior

reactor analysts which are a very important part of the ROP. And we've had, for the three and a half years I've been here, we've had the same three SRA's. And I think -- those are positions that did not see, at least in the beginning did not see a lot of stability but there's a lot of movement in there. Those are very capable people and they oftentimes would barely get through the program and they'd be taxed with another job of greater responsibility.

MR. BANERJEE: What sort of problems would they tackle, the senior reactor analysts? Banerjee, ACRS, Sanjoy Banerjee.

MR. SATORIUS: I think your question was what kind of problems do they tackle?

MR. BANERJEE: Yes.

MR. SATORIUS: We use them in a variety of ways. One of the major ways is in the risk informed reactor oversight process which when performance issues are identified, the findings can be reported, an analysis of where those performance issues which you put in this perspective, whether they're performance, there's inspection findings that are green in nature or white or yellow or red. So, they provide the insights that give us a measure

of how safety significant from a risk perspective problems are at the plant that we identify during an inspection.

MR. BANERJEE: Can you give me an example?

MR. RYAN: So, they're PRAP, is that right?

MR. SATORIUS: That's right. That's exactly right, they're PRAP.

MS. PEDERSON: We'll be discussing an example, this is Cindy Pederson, we'll be discussing an example this afternoon regarding Byron. And we're going to have one of the SRA's come and discuss it. That might be a helpful --

MR. WEST: Actually we'll have a couple of SRA's down here.

MR. SATORIUS: Yes, there will be, there is, we have what we call site actuals that we're actually going through in the afternoon, some specific events that we have dealt with recently in the last year or so. And I think we'll cover that pretty thoroughly at that time.

MR. RAY: This is Harold Ray. Will that include the tritium leak at Braidwood?

MR. SATORIUS: Yes, it will.

MR. RAY: And any lessons learned out of that?

MR. SATORIUS: Yes, it will. And I know that you all had an opportunity to see, you know, I guess what I would characterize as quite an extensive reaction by the licensee in dealing with that tritium. Sir?

MR. ARMIJO: Sam Armijo. Who handles reported -- issues? Or have all the channel bowing -- is that project by project or is it through the engineering staff?

MR. SATORIUS: I would say project by project. We get a lot of help from, we don't have a lot of expertise as far as folks with a tremendous amount of experience in that area. We get a lot of expertise help from headquarters. And that's one of the things that probably now is as good a time as any, I was going to mention it later, is that we get extensive back and forth between our inspection resources and the resources that are located back in NRR head offices, and especially for issues such as that.

And channel bowing is one that is interesting because issues of LaSalle in this Region concerning the channel bowing of that kind, that we

used our friends in the NRR to help us as the licensee deals with that and so we understand the directions that they're headed.

MR. BANERJEE: Do you have a formal process that you contact NRR for help and --

MR. SATORIUS: Yes, there is a formal process and there's also informal. And it's kind of a, there is no hard line that's, okay, now we need to go formal because we'll have general conversations back and forth on a daily basis where NRR is tracking issues that are occurring at each of the four regions. And those will take place on a staff level almost on a continuous basis where we're talking back and forth.

But if something becomes a little more complicated where it's going to require a lot more resources and a lot more research, there is a technical, TIA, technical --

MS. PEDERSON: Task interface agreement.

MR. SATORIUS: Task interface agreement that is a formal document where we will lay out an issue that the region has and really doesn't have the resources to be able to come to -- line. And we'll task it to NRR and then they will staff it. And then those hours could be charged appropriately

to the specific task. And then they come back to us with their conclusion on how this matter should be dealt with through the regulatory perspective.

MR. BANERJEE: And also at the other end, what is the relationship with the resident and the -- how does that --

MR. SATORIUS: The resident inspectors, we just had it about an hour ago, we have a daily 8:15 meeting and we're tied in, we have video teleconference with the project management staff in headquarters in NRR. There's an individual in NRR that is assigned to each plant, and that is for the purpose of licensing, you know, accepting license amendments, processing license amendments. And they're like the tie to the plant from headquarters.

They tie in to that status call as we refer to it at 8:15. And during that meeting we go through each of the DRP projects, branch chiefs, and they will give the plant status whether the plants are at full power and they have certain tech spec issue that they're into that is giving them a condition for operation that they have to -- the plant or shut the plant down. It's essentially just status of the plant, what's going on at the plant. And that's discussed everyday at 8:15 and

headquarters is tied in from the projects perspective so that they can keep their finger on the pulse of what's happening with the plants here in the regions.

So, the resident inspectors have a daily call early with their branch chiefs and report the status of that plant.

MS. PEDERSON: And often, the project managers from NRR participate on that earlier call. And so, there's another opportunity for discussion and dialogue as well as these things come up through the day.

MR. SHACK: So, that call is a one-on-one call that you and the resident inspector --

MR. SATORIUS: It's the branch chief and all of his residents. So, I think as you saw the earlier slide, all the branches have two or three plants. Those three plants will have their own bridge call and that happens anywhere, it depends, from 7:15 to a quarter to 8:00 and they discuss status.

MR. CALDWELL: Jim Caldwell. Our relationship with NRR, it's one reactor program so we do have some formal tools so they can charge time to the type of work that they do. But we

communicate with NRR, they communicate with us on a regular basis about issues. And like the channel bowing issue, that wouldn't be, that's more of a generic issue. And NRR will take the generic issues and work on it for whatever communication and actions we want to take across the country. If it's a specific plant issue, then we'll talk about that specific plant.

But it's a collaboration. We work together and talk with those folks all. There is not a barrier between us and the headquarters office.

MR. BANERJEE: Let me ask a question that, with this sump screen, GSI 191, there's a lot of -- screen made for these plants it seems like. And the resident inspector who does the sort of due diligence to show that everything is occurring as the design said to do it right, how is this then interfaced to NRR who is ultimately responsible for resolving GSI 191? I'm trying to understand the steps that are in this process?

MR. SATORIUS: Is that something you were going to discuss?

MR. WEST: I can discuss it now. This is Steven West, DRS. Actually there are several

things that are going on kind of in parallel or in series -- what the status of the plant. But the resident inspectors are performing a part of the review of the modifications that are done by the licensees. Everything they do is reported in an inspection report so everything is documented.

In addition, we have DRS inspectors that are --

MR. BANERJEE: I'm sorry, I didn't hear --

MR. WEST: We also, so we have the resident inspectors that are doing part of the review. We also have inspectors in my division, in DRS, that are doing another part of the review. It's more of the documentation and calculations type of review. And also, headquarters is involved in the review itself, it's reviewing some of the plant specifics and also the generic aspects of the issues.

And there's a lot of, Mark had talked about a lot of interaction between our staff here in the Region and the staff in headquarters. And there's also interactions between all the regions and headquarters folks that are involved in the issues. So, there's a lot of exchange of

information, both formal documentation through the work we're doing, through inspection, through the reviews that headquarters is doing and through the discussion of issues that are coming up.

MR. BANERJEE: Is it clear, the division of responsibility in this to ensure nothing falls between the cracks?

MR. WEST: It's fairly clear because a lot of it is controlled through inspection procedures, temporary instructions, the type of inspection procedure, generic communications. And headquarters has generic communications review plans that they follow. They make sure that they capture all aspects of the generic issue and what the licensee is supposed to do and what we're supposed to do. So, it's fairly well controlled and that's pretty typical for a generic issue.

We'll be talking about some other issues like that later today this afternoon.

MR. MAYNARD: Otto Maynard. Just a quick question for the GSI-191. You actually own the sign-off that a plant is meeting the requirements, is that the headquarters or is that the region?

MR. WEST: Well, the headquarters will

be, at the end of their process, they will be writing a document that says a generic issue has been completed. But then it will rely on their own inputs and inputs they get from the regions.

MR. MAYNARD: But for a specific plant?

MR. WEST: For a specific plant, we will document the portions of the review that we're responsible for based on inspection reports. And we'll be signing out inspection reports that document the review and say this is complete to our satisfaction.

MR. SIEBER: You basically cover the construction and installation to make sure that it matches the design documents which are the basis for NRR's decision as to whether it's okay or not. On the other, with GSI-191, all the testing is done and the licensees are installing the equipment. And I think that more has to be done in 191 space before everybody can sign off on it.

MR. WEST: This is Steve West. There are still some testing going on, largely in the chemical effects. And that's, as I said, still ongoing. So, the results of that testing and I think the tests have shown some additional work is needed so they're going back to into additional

work. But it will impact the ultimate resolution of the issue overall.

MR. SIEBER: And this will have impact on BWR's I'm sure.

MR. WEST: I've heard that headquarters is going to re-look at BWR's, yes.

MR. SIEBER: Well, there's a lot of new information now.

MR. WEST: Right.

MR. SIEBER: That wasn't there when the BWR's were doing --

MR. WEST: Exactly. I mean, that would be part of our operating experience program. When we get new information, we do go back. And even if an issue has been looked at before and closed out, we may re-look at it based on our operating experience.

MR. SIEBER: That's right.

MR. CALDWELL: Just to, Jim Caldwell, just to add one thing. This is, you know, this is not unlike any other issue that licensees have designs that licensees have to implement. It's their responsibility to meet whatever criteria they have to meet to make it successful. They have communicated to headquarters what their commitments

are including the chemical testing. And when the chemical testing is not satisfactory, they have to tell headquarters and we get informed.

What we do is we have the boots on the ground so to speak. We get to go look at the stuff that they have said they have committed to do and we get to see if they are following their design. But ultimately, they are responsible and then headquarters will look to see that it looks reasonable. And we'll go out and make sure it's been implemented like they said they would. And we document that, as Steve said, in our inspection reports and ultimately headquarters has to close out the generic safety issue.

MR. SATORIUS: Okay. I'll go ahead and move on. The third technical division is the Division of Nuclear Material Safety. And I know the committee here is primarily focused on reactor matters but this division and the Decommissioning Branch is responsible for inspecting independent spent fuel storage facilities and we are concerned with their construction and their operation. We have ten of those installed and I know you're going to get a presentation by that later in the morning so I'll just go ahead and move on.

I want to talk a little bit about knowledge transfer and knowledge management. This is an area where I think as the agency has matured in the last, I'll just say eight or ten years, and a number of baby rumors are getting to the point, well, it's happening throughout our nation. A lot of folks are hitting the retirement age and what are we going to do to try and capture some of the knowledge that has been gathered over many years that those folks have been involved with agency activities.

When you look at statistics like there are 50 or 60 percent agency staff that's either eligible or within five years will be eligible to retire, it makes one

pause --

MR. SHACK: Is that roughly true for the Region here also?

MR. SATORIUS: I think it's, you know, I don't know. I don't think, we're not quite that old out here.

MS. PEDERSON: We just like to think so.

SPEAKER: Speak for yourself.

SPEAKER: We're young at heart.

MR. SATORIUS: But I think it pretty

much does follow that, you know, we're seeing about the normal amount of retirements here but, you know, time marches on. And so, the agency has taken a very serious approach, I'll jump down to this last bullet, there's a knowledge management steering committee that is being developed. It's chaired by Marty Rogelio and it meets periodically. It consists of all the officers, deputy directors and regional administrators to look at corporately how we should deal with knowledge management and to support and kind of carry the standard for agency activities with knowledge management and crunching back and forth on what various offices are doing and what various regions are doing.

One of the things that hampered us a little bit, it's not until next year we're actually getting budgeted resources to be able to, so we're kind of taking it out of hide to get ourselves up and running and started. You know, there's a lot of infrastructure that's pretty much in place already. I've got a couple of things that just happen to be Region III inputs to the corporate knowledge management, and one is, this is a brochure.

It's a D Reg Brochure Number 0326, it's the NRC Inspector Field Observation Best Practices.

It's got a lot of the hard learned things that we don't necessarily get in a qualification program but are very, very useful for inspectors in the field. This was, essentially was a regional type guidance document that got pulled into an agency.

More recently, and this is still a draft, Julio tells me it's going to the printers, it's an engineering design control quick reference guide for NRC inspectors. This will be published, this was the instruction manual that we use within the region that was looked upon as regular practice. So, that's an agency initiative now. Yes, sir?

MR. CORRADINI: Corradini, ACRS. I guess I'm kind of curious about this because I think I know what you're after. So, is it more personnel in terms of how you want to properly mentor the young hires to get to know what the more mature folks know in terms of essentially a skills tool set? Is it information about the reactors? What exactly are you focusing on? What sorts of, I guess I'm still, I heard this talked about at the headquarters. I'm still struggling to understand, I thought it was more the former. Is it both?

MR. SATORIUS: It is more, I'm saying it is more the former but actually it's a --

distinction. it's the passing of knowledge from one generation to the next. You know, those hard lessons that one learns in life as for, in a profession issue go through the learning process. And also, more formalized as well, so it's the general passing of knowledge I would say.

MR. CORRADINI: How do you use retired NRC employees? For example, you have individuals who are former EDO's, former directors like, the one that I'm thinking of is Bob Benaro, I ran into him in other venues. Do you bring back retired NRC folks essentially into the regions or into headquarters to almost be, I want to say senior folks to kind of look and say you're missing this? Because to me this is an important thing and I'm curious how you use all the mature folks that have left but yet are fairly active in their own professional careers. Is that part of it?

MR. SATORIUS: That's a part of it. I know that Region II recently had Frank Varalla.

MR. CORRADINI: Right.

MR. SATORIUS: They brought him down to provide some perspectives on a certain activity that he did have experience with during his career. So, there are pieces of that that are also a part of

this overall initiative.

I think we're set for a photo op in about 10 or 15 minutes. So, we're going to go ahead and move through.

So, the Region III knowledge management focus, we've decided that we would focus on about three or four things to begin with as we got our program off the ground. We have had in the past a bi-weekly knowledge transfer/ training session for the NSPDP. Those are essentially our college students that we brought on board. That acronym stands for the Nuclear Safety Professional Development Program, people we typically call interns, the new hires that we bring right out of school.

We have had a bi-weekly knowledge management training activity for NSPDP peers, new hires and other interested staff. We restructured that. And the next slide will give you a little bit of an example of how we've restructured that. And you'll see some of the topics that are covered in that.

We want to develop a Region III knowledge management web site. This will essentially be a link for Region III web site. And

as these web sites are constructed, there's a lot of knowledge management type information out there in various places, now that will essentially be the pointer that will point you to the various places with links. We have hired a summer student who is in college in his senior year next year who is helping us with that. We have a number of them but we have one in particular who is helping us with that web site.

We want to develop some sort of mechanism that was interesting, that would capture one's attention and be valuable that would capture training presentations. And I have an example of that that I'm going to show you on the next slide. I'm going to, once I've got this underway, and then capture additional in-house and scheduled training through the divisional training and branch training or those sort of activities.

This is the biweekly knowledge management/knowledge transfer training. And what we've done is similar to what a lot of reactor plants do and maintenance organization, they will set up a nine-week, they do it -- so a nine-week or an eight-week, however the configuration is, of an outage scheduling or maintenance scheduling or

operator training. And we've just hit 20-week because we wanted to do it twice a year, so instead of doing 26 weeks, we've got holidays and others. So, essentially this 20-week, it's a long 20 weeks, it goes on to six months, and after you accomplish one, you start it again because we have new hires coming in constantly.

And it covers topics like, you know, 10 CFR Part 50 or the design control agreement states programs. And it provides knowledge transfer to these new employees that will bring them up to speed to what these agencies' activities are, particularly for a regional focus.

MR. CORRADINI: Do you get feedback from the trainees about how that, Corradini, ACRS, do you get feedback from the trainees about how they like it? In other words, to put it roughly, in today's world the kids like to talk to each other. Do you set up a blog so you can actually get them to tell you how it is?

MR. SATORIUS: It's interesting you should mention that because that is the focus, and you said it right because young people do, they're very familiar and very comfortable with these sorts of things. And they feel very much at ease in

opening their soul so to speak in some of these things. And so, that was, creating a blog within our knowledge management web page for individuals to be able to communicate with each other is one of the things that we intend to do as well. So, it's an under construction project I guess you could say. And at our regional knowledge management council, we have gotten some of our new employees because they do bring interesting insights to the table.

MR. CORRADINI: So, what I want to ask you that all the students come to me about, so the other thing that is done very much at the university stage is can actually start a Wiki if you know what it is. Essentially you require the employees to essentially fill in the knowledge themselves by building a knowledge base and use this Wiki software such that you can actually put things in and --

MR. SATORIUS: How do you spell that, sir? Wiki, how do you spell that?

MR. CORRADINI: It's W-i-k-i.

MR. SATORIUS: Oh, oh.

MR. CORRADINI: It's essentially a software technique where you essentially can build, well, Wikipedia was built that way. But basically it's a software technique where you actually have

people put in information. You can then essentially have senior people look at it and make sure they didn't just invent it.

MR. SATORIUS: Right.

MR. CORRADINI: Like the second law in reverse, God forbid, or something. But then you actually get the people's energies to build the information. And these students, again, once again I'm dealing with younger people, really like to do this. And you get all sorts of out-of-time effort infusing information in. So, it's just a thought.

MR. SATORIUS: I appreciate that, thank you.

I'm going to, one of the presentation capture activities we've already gotten started with is this podcast training session which -- Tom, I don't see it. I don't see a cursor so I can't click on that. How do I get it? Oh, there it is. Okay.

This is a, you probably are, a lot of you are probably familiar with this type of software. This is the type of software where an individual, for example, who'll give a PowerPoint presentation, you can wire him up such that it will automatically tie his voice to the slide he is on. And it's pretty slick, at least from my perspective.

(Start of video presentation.)

MR. LARA: Okay. Knowledge transfer. This second topic deals with engineering design control. You know, we have our baseline inspection program with some of these inspections that we perform dealing in the operations world or maintenance effectiveness world or plant status. And there is only a select number that really deal with engineering and either you've got a smaller percentage of inspections that truly deals with design control. And one of the things that I'm often -- in my conversations, I get questions from some of the resident inspectors.

(End of video presentation.)

MR. SATORIUS: What this allows you to do is, let me --

MR. CALDWELL: Really once Julio is on, you can't get him off.

MR. SATORIUS: What this, I'm not going to play the whole thing because, but it does, as Julio works through the slides, the slides will change. And there's going to be a pop-up menu that allows you to, well, I've started to watch this already. I want to go straight to slide 7. This is

slide 7 and bang, it goes right there. So, it's pretty slick.

And we've gotten to where we're podcasting all of our training and working towards being able to do this on some of the, I guess more ad hoc type things. Following our 8:15 morning meetings, we'll oftentimes have a knowledge management piece where something would be mentioned during the 8:15 meeting that us old gray hairs know about and understand. But the new people may not understand that, granted they may understand the concept, you know, and adopt the concept in the training. So, we'll have folks from the audience at this 8:15 that are not actual participants say I don't understand this and we'll have an immediate feedback session right there. So, we're looking at the possibility of podcasting that and putting that on our web site, populating that on our web site with other sort of activities.

And then the second bullet talks about we have fairly extensive materials picture library because our materials program has a lot of different devices. And it's a general good thing even for reactor folks to understand that some of these devices that's part of radiography are even used

within their power stations. So, it's a good thing for people to understand and have general awareness of them.

MS. BANERJEE: Maitri Banerjee. I have a question, Mark. Do you share this kind of training, you know, the processes and the -- with other regions or headquarters?

MR. SATORIUS: Some of these activities are just within the past few months, so I've got a counterpart meeting with the other deputy RA's next week and I intend to highlight these. But we do typically share with the other regions at least because while we're all one agency, regions do kind of have a special, because of their remoteness, have a special akin-ness to each other. So, we work kind of closely with our region folks.

MR. CALDWELL: So, their ultimate goal would be this would all be on a web site. Jim Caldwell. All in a web site for anybody in the agency to access.

MR. SHACK: Shack. One of the things I found, everybody always tells me this stuff is on the NRC web site and I go look for it and I can't find it. I'm not even sure how I start my Citrix connection and find the Region III web site.

MR. CALDWELL: It's an internal web site so you'd have to have --

MR. SHACK: Yes, but I have my Citrix connection set up so I'm internal.

MR. CALDWELL: And I'm pretty sure that the NRC website lists all the regions. You click on them, it will go the regional web sites.

MR. SHACK: That part on the ESW -- last week and I couldn't find it.

SPEAKER: ACRS put a block on it.

MR. CALDWELL: That may be the case so we can't fix that.

MR. BANERJEE: I found a more general -- Sanjoy Banerjee. You are in an area where it's exploding with -- issue is related to the -- how do you query these databases and get the information you want out of it? That's why they trip -- many different people. It's a form of data mining and it's not obvious because -- question of how come -- what are you doing about that?

MR. SATORIUS: You know, that's a great question and I have, my branch chief who is Jeff Foltz is instrumental, he's in up to his elbows in some of these knowledge management activities from the technical perspective that you just asked. So,

I don't know, Jeff, if you could maybe either get to a microphone or if the court reporter can hear you from there on his machine, if you could maybe answer the gentleman's question? Identify yourself.

MR. FOLTZ: Jeff Foltz, NRC.

MR. SATORIUS: Come over this way, Jeff, please. I'll just give you the podium.

MR. FOLTZ: What we're building is a picture taxonomy so that we can use that along with a couple of other image tools so that we can meta tag all of these images that we told you about we have in the region. I'm working with my staff and staff in other divisions to get NSPDP peers and other experienced staff to be able to help us use text on meta tag the pictures. After the pictures are tagged, you can use an open-ended search kind of utility which we think we're going to call Ask Monte in our region.

But anyway, what that will do, it will allow you to put in key word searches that will pull up these documents because as you, or pull the pictures rather, as you know, they're usually stored in strange little names like J3400.123.jpeg. You know, you have to look through thousands of pictures to find what you want. So, we're putting in a

taxonomy and the work ahead of them to get the meta tag in the searchable database so that they can use them.

MR. SATORIUS: And I'm just about, so as we developed our web site and Jeff continues with his good work, our intent is to link out all these various pieces. We have routine training podcasts that you saw an example of. We have, I told you about our 8:15 status meeting where we keep our notes on those which are then put into a file and are searchable so that you'll hear statements at some of our 8:15 meeting like there's a turbine driven aux feed water pump problem at Braidwood. Wasn't there something like that five or six years ago at Byron? And we're trying to build a database that's feeding those so that you can query it and go back and capture that information because the branch chief at Braidwood is gone and the resident inspector is gone.

So, all of that is further linked to agency knowledge management resources, the picture library that Jeff spoke about, both agency and regional operating experience, and then what I had said, the post 8:15 podcasts, those are the impromptu post 8:15 questions where an issue will

come up at the early morning status. And then it's kind of an inside Region III joke but we have one employee, Monte Philips, who is kind of our focus person for operating experience. And he has been with the agency for, how long, Jeff, forever?

MR. FOLTZ: I don't know. Long as I've been here.

MR. SATORIUS: We've got, we're working on calling our search site an Ask Monte case. And Monte's got, he's very excited about this. He considers this quite a compliment. In fact he works for Tom and I think Monte talks about it on occasion. So, that is our search function that we'll be moving forward with. So, with that, again, unless I hear other questions, I think we have --

MS. PEDERSON: Break and photo.

MR. SATORIUS: We have a break and a photo shoot. And I think the photo shoot is going to be, in the front of your books you can see a picture of Region III. And we're going to do a similar thing with you folks here out I think in front.

MR. KOZAK: Yes, if you could, why don't we, right now if you could proceed to the elevator, we'll go down to the first floor and we'll go out to

the front of the building. I'll meet you down there, get a quick photo, and then if you need to use the restrooms, of course you know they're right down the hall outside of the last doors here to your right. And then we're supposed to start again at 9:45 but if we can get back as close to that as possible, that will be great. It's only ten minutes so we'll probably start a little later than that but if we can gather as soon as we can, that would be appreciated. I'll meet you downstairs.

(Off the record for break and photo.)

MS. PEDERSON: Good morning. Again, I'm Cindy Pederson, I'm the Director of the Division of Reactor Projects. And Steve West and I are going to go through a number of items related to Region III's oversight of the Region III facilities. I do want to mention you can see a lot more folks that have joined us. Many of these folks are branch chiefs that are overseeing either their sites as part of the Division of Reactor Projects and we've gotten some more individuals from the Division of Reactor Safety. So, if you give us some really hard questions, then we can turn you to the folks over here to help us with those. So, please feel free,

if there's something as it comes along that you have a question on, please feel free to ask as we go.

I'm going to start because there's a number of new people in the Committee I thought with just very few minutes on the reactor oversight process to just kind of ground us before we move on. It's fundamental to how all the regions do business. It's our guiding principles on oversight of the reactor safety program. Two fundamental areas, inspection and performance indicator which I'll touch on both.

First, we'll start with the baseline inspection program which is the set of procedures that are done at all sites. And they are done at what we believe to be an acceptable level to monitor safety performance for a licensee who is operating well or operating in what we call column 1 which is the licensee response column. And I'll touch on that a little bit in a second. So, this is what everybody has.

Now, as licensee performance changes and we have performance issues that come up, whether they're findings or performance indicators, we can then move into what we call supplemental inspections. And just a brief overview on how we

evaluate significance, we referenced earlier to a color scheme in which we communicate significance. Green is a very low safety significance. It then goes to white, yellow and red. And also, there are thresholds for performance indicators modeling those same colored thresholds.

We use those as inputs as it comes to supplemental inspections. White findings or white performance indicators get a certain level, about a weeks worth of additional inspections. Yellow gets more and red gets more than that.

MR. BROWN: Charlie Brown, ACRS. Are these compliance inspections? In other words, your local residents are inspecting, or part of it anyway, for licensee compliance with their procedures that they are operating and actually following -- that their material inspections are done when they're supposed to, that their instrument calibrations are done and validated, et cetera, et cetera, their instrument calibration program, on and on and on?

MS. PEDERSON: Those are all part of the --

MR. BROWN: That whole part, is that the local resident responsibility?

MS. PEDERSON: It's a combination of both. Resident inspectors do look at a number of areas that are supplemented by the region based inspectors. Residents you can kind of think of from a generalist standpoint. They look at a little bit of everything, particularly focused on operations, maintenance and surveillance type activities. They also get into engineering, they get into some security, HP (health physics), and emergency preparedness as well.

They are supplemented by the region based inspectors who are the experts in the areas of engineering, operator, operator licensing, emergency preparedness, security and health physics. So, things, they've got baseline inspection procedures that they do, and in addition, if the residents are observing something that they think need additional help, they will call to those experts to help supplement that onsite. So, it's a combined program.

MR. BROWN: Okay. Does the Region ever go down to confirm that the resident inspectors are actually performing --

MS. PEDERSON: Yes.

MR. BROWN: -- validate the validity of

their findings, you know, spot sample, whatever it happens to be, is that part of your Region program?

MS. PEDERSON: Yes. The branch chiefs go out basically quarterly or more to their sites, interface with the residents, interface with the licensee, go out in the field with their inspectors. As well as the region based supervisors also go out with their inspectors in the field. So, there is an oversight process.

In addition, when you have a combination of resident inspectors who are onsite all the time, region based inspectors who come to that site and other sites, there is an opportunity as well to look for differences. And so, there would be differences observed in that way. It's another way of kind of a check and balance to the program as a whole.

MR. SIEBER: And you send residents from one plant to another p1ant as part of this supplemental team?

MS. PEDERSON: Yes. We do have, there's a couple of things, resident inspectors are required each year to go to another site as a kind of an objective, I use that kind of loosely as a title. But so, they go to other sites, and definitely when we have inspection needs at other sites, either

special inspection or just a routine support, we also do have them go back and forth as well.

Mr. BROWN: If a licensee extends his -- does that impact your inspection program significantly?

MS. PEDERSON: We have inspections that are outage based, so longer outages, those occur less frequently. But most of ours are based on a calendar year. Some are based on a one-year calendar cycle, some are two-year and some are three-year cycles. So, depending on what the inspection itself is, it varies by time. But there are some specifically linked to outages.

MR. CALDWELL: We do, there is also a benchmarking, Jim Caldwell, benchmarking. We have our inspectors inspecting other regions and other region inspectors come to our region. So, there is a crosswalk between the regions as well.

MR. SHACK: How do you deal with extremely specialized inspectors like NDE which is kind of a fairly rapidly changing field?

MS. PEDERSON: We have, those specialists are in the region. Dave Hills earlier this morning, they work for him and they go out to the various sites. And so, they are very

specialized and they go out for those very specialized inspections. So, they're experts in those areas and they go around to the different facilities.

MR. BROWN: Let me --

MS. PEDERSON: Please.

MR. BROWN: Excuse me. When there is a change, a configuration change, piping change, material change, is there a, is that only monitored by the resident? Or does the region actually confirm the validation of any -- materials, et cetera, et cetera? Or is that strictly the licensee thing or it's on a piece of paper and those are just followed up? I'm being a little pejorative in the way I phrase that but that's --

MS. PEDERSON: The inspection program is based on a sampling system. And the inspectors will sample a portion of a licensee's work, whatever is the focus of that inspection. NDE as your example, they'll go out and look at work in progress as well as review some of the records associated with that. So, there is an independent review by the NRC of those activities. Too, they look at every system and every weld node, it's --

MR. BROWN: I didn't expect --

MS. PEDERSON: I'm sorry, I didn't mean to imply. And they look at those for some safety significance. Those items that are more significant are chosen first to try to get those that are more important on a safety standpoint in order to make sure we get eyes on those first.

Let's just keep on moving here. Temporary instructions, we heard reference to that earlier, that's for a specialized one-time inspection. It may be for all reactors or it may be a subset, maybe the PWR's or maybe even BWR's.

We also have, an important part of our functions are event response. And those responses can be in a number of different sizes if you will based on significance or the number of unknowns with the event. Resident inspectors are the first responders. They're the ones that are there. Each site has two inspectors that are stationed at that facility and they'd be the ones that would get the first call, they would be the first ones to respond whether it's a plant trip or some other abnormality.

Then we have a process that's driven out of the management directive, 8.3 is the number. And it's an assessment process we use to evaluate the significance on the basic information we have at

that time, and then we judge from that whether we escalate our response. And basically, special inspection is one level and then we go up in significance how many inspections gets investigations.

For those that are reactor safety focused events, we use both determinant and risk perspectives. This is one of the areas where our senior reactor analysts get involved and help us assess the risk significance. More risk significance, we up our reaction to that event and supplement with more people and create special inspection team or an augmented inspection team.

There are some that aren't easily evaluated from a risk perspective. Some of the non-security events or EP, those kinds of things. So, we use more a deterministic process to determine special inspections for those activities.

MR. STETKAR: Excuse me. Stetkar, ACRS. That process, the safety significance determination, is that primarily, this is kind of a leading question but is it primarily done here within the region? Or if you could characterize it, what sort of interaction do you have with staff back at headquarters?

MS. PEDERSON: Excellent question. We do interact --

MR. STETKAR: How is it done?

MS. PEDERSON: We do interact. Actually, part of our Management Directive 8.3 and the other implemented guidance does have coordinating with NRR and get their agreement to do a special inspection as an example. Or we discuss it that we think it's closed, or we don't think it quite meets it, we discuss that with them as well. When the risk reviews are done, our senior reactor analysts also interface with risk people in NRR and other resources.

And we also do touch base with the Office of Nuclear Security and Incident Response. We are actually the owners of the IIT (incident investigation team) program in Management Directive 8.3. So, we also interface with them in determining if a special inspection will be done or an augmented inspection will be done.

MR. STETKAR: I guess I was asking a little bit different question in terms of where you feel the, you mentioned risk assessment as an input and I'm a risk assessment guy so you got my interest. Do you feel that you have sufficient

expertise here in the Region to make the vast majority of those determinations without so much outside input?

MS. PEDERSON: Yes. Yes, we do.

MR. WEST: Yes.

MR. SATORIUS: But it's important, Satorius, it's important that we'll reach out and get peer checks.

MR. STETKAR: No, I understand that.

MR. SATORIUS: Yes.

MR. STETKAR: I'm just trying to get a feel for how much of it is done essentially in-house here within the Region versus, and that's kind of a measure of the level of expertise, how comfortable are you in here over that process.

MS. PEDERSON: We have three very experienced --

MR. SHACK: You've had access to SFAR models?

MS. PEDERSON: Oh, yes.

MR. SHACK: For the reactors within the Region?

MS. PEDERSON: Yes.

MR. BANERJEE: Banerjee. Can you bring in outside people on your teams currently to augment

with expertise --

MS. PEDERSON: Normally where we get that augmentations from NRR or if it's a security EP related we get from NSERP. So, yes, it is available to us and they've been very able to support us when we needed that expertise. One of the areas you're going to hear this afternoon is on Perry Scram and there's a case where we used more individuals --

MR. BANERJEE: You may need to go beyond NRR in some cases?

MS. PEDERSON: Yes. We --

MR. BANERJEE: With an incident or something like that.

MS. PEDERSON: We have not experienced that in the recent past but we would work, NRR has contracting ability, and so that's where we would go for that.

MR. BANERJEE: Through NRR, you get these people?

MS. PEDERSON: Correct.

MR. BANERJEE: Even directors --

MS. PEDERSON: Correct.

MR. BLEY: Excuse me, Bley, ACRS. Is that the same per se research support thing that --

MS. PEDERSON: Yes.

MR. BLEY: You go through NRR and they go --

MS. PEDERSON: Yes, usually NRR is our first point of contact. We've been doing a fair amount of interaction with the research department on the tritium issue. And this afternoon, Steve Orth who is with us will be talking about tritium and he can touch on those interfaces. But we've got tremendous support from research on the risks or health significance of tritium.

MR. SHACK: Do you have to, do you actually use their -- something or is it more --

MS. PEDERSON: I think it's similar to a task interface but I'm not sure what they call them. They call them TAR? A TAR, technical assistance request. Different offices call it differently, it's the same basic request.

MR. SHACK: Okay. But directly to them.

MS. PEDERSON: Yes. Anything else? Okay.

Another part of our program is the allegation program. We accept the allegations from members of the public, plant workers tend to be a source of allegations for us. Contractors who go plant to plant, we see allegations from. This is

another source of input we get and that process is quite formalized where we evaluate how we are going to address that allegation. Do we do it by inspection? Do we do it by asking the Office of Investigation to do an investigation? And those kinds of things. So, that's another part of our process.

I've mentioned the significance determination process, the coloring of findings earlier. There's another process that we use for things that are what we call traditional enforcement or things that affect the regulatory process. So, we still do use the traditional enforcement school in the reactor world tending to be for things such as willful violations or like an individual wilfully violates requirements, procedures or discrimination. So, those we deal with in traditional enforcement space.

And then just every six months, and we're going to do this here in a couple of weeks, all the regions meet individually in their regions. They go through plant performances for all their plants. We call it mid-cycle assessment that we're doing at this time frame and end of cycle. And so, from that come the evaluations where we determine

whether there are substantive crosscutting issues or additional inspections that we want to do going forward.

The ROP has been in existence for a number of years but it's not static. We continue to assess it. We continue to feedback into the process by asking NRR to examine things and we use what's called the feedback process for that. As well as we do what are called realignment where we look at the program as whole, we look at how we're spending our resources and look at whether adjustments should be made.

And that's an example where the component design basis inspection move from biennial to triennial, and with that change other things. The three being engineering team inspections were lined up such that one could be done each year of the triennial cycle. So, that's a case where we realign our existing resources to maximize our effectiveness.

MR. MAYNARD: One thing I didn't see anywhere on here -- is safety culture and crosscutting issue, how that's impacting --

MS. PEDERSON: I'm going to get to that in a couple of slides. But in concept, every six

months we look at the findings that have been developed during the 12 months prior. And we look at the aspects of the human performance aspects, problem identification and resolution or safety conscious work environment.

MR. MAYNARD: I was thinking more of how your inspectors go, do they have sufficient guidance in dealing with these issues rather than whether there are issues.

MS. PEDERSON: Okay. I think one of the things, that continues to evolve. I think it was about 18 months ago, we implemented kind of a new process in dividing the aspects differently in the binning of those. And so, we've done training on that. I think if you ask individuals, there is probably a sense that some more training might be helpful and we've got some of that planned for later this year.

In addition, that whole program is being examined. Do we have the right aspect? Are we looking at the right kinds of things? And are we binning them up in a way that makes no sense for engagement? So, that's a very active part right now of agency review.

Just briefly, this is how the layout of

the reactor sites in Region III looks. And I just wanted to give you a very high level summary of plant performance in Region III. Partly, we have two units, the two Byron units that have a white finding which puts them in the regulatory response column, column 2 of the action matrix based on emergency service water, and you're going to get a brief on that technical issue this afternoon in detail.

Perry, this is a case where it was a performance indicator driven result where they had a number of Scram's that we examined. And just to note, the data that ends June, second quarter of '08, that performance indicator has returned to the green band preliminarily based on the results that they have submitted to us. Just a note on performance indicators, licensees report them to us but we do inspect them to ensure whether they're valid and accurate information on the licensee's requirements.

MR. CORRADINI: Corradini. I guess I want to, to use Perry as an example only. So, they have been green, white, yellow, red to come back to, they tend to come back down. And so, as I plotted over the years, even though I have a three-

year rolling average at an individual plant -- so what does the Region do relative to perennial worrisome folks? In other words, if the three-year rolling average measurement being they can't get out of the, I don't know the right name for the actual matrix column or whatever it is, but your staff or folks must talk about it such that you're looking at things. Is there things related to the management or you might call it safety folks but management of a particular plant that you're allowed by regulation to, or is it more a matter of talk and persuasion and kind of -- do you see what I'm asking?

MS. PEDERSON: Yes. And actually excellent lead-in because Perry is one of these people that's on this next page going from, this is end of cycle 2006. There were three units that were in column 4. Those units were the Two Point Beach units and Perry. At the end of that time frame moving into the next cycle leading up to the end of cycle of '07, they cleared the criteria for departure, column 4, the red finding that Point Beach would close and Perry had a mix of yellows and whites that was based on inspection.

And part of that at that time, as in many of these, we would look at whether we believe

they have processes and programs in place and performance has been shown to say they warrant removal from that column. And at that time, they met the criteria. We believed they had performance in place and they were demonstrating that performance.

What we noted in subsequent six months to a year, they stopped implementing some of those processes and programs and oversight to the point where we started to see some decline. And part of that appears to be failure to internalize the need for change and internalize some of those processes and programs and procedures and standards such that we start to see some give.

Now, programmatically, we haven't been able to deal with that. We have, by our procedures, we have the additional 200 hours to spend after a plant exits column 4. And that extra number of hours is to produce extra inspection resources devoted to looking at the performance. And that's how you find some of these things such as performance declines.

Now, additionally, with Perry and with Point Beach, our substantive crosscutting issues have come into play. During succeeding six-month

periods, we've evaluated the less significant findings that are coming up because they were less significant findings. But we're looking at those aspects of human performance and problem identification and resolution and we have reopened new substantive crosscutting issues because we see for those low safety significant items they're showing some of those attributes or aspects that give us some pause to take a look at their performance. And so then we engage and we have extra meetings with them, we have extra site visits, we have numerous opportunities to talk with their senior managers and so on.

So, it's kind of multi-fold but we do have additional resources as the plant exits column 4. And then we also have the regular tools that we have for the ROP and those additional engagement opportunities that we have.

MR. CORRADINI: Thank you.

MR. BANERJEE: This is primarily then on friendly persuasion or is it about getting rid of --

MS. PEDERSON: Well, our procedures have actually an escalated approach on substantive crosscutting issues where you increase the engagement with licensees, where you first start

with, you know, you send them a letter and describes it and we ask that they take corrective actions. Well, if that's unsuccessful, then we escalate it and next time we ask for a discussion during the next public meeting. Licensees don't necessarily like to talk about their problems publicly so that increases their focus a bit more. We also then notch it up and ask for a written response which is public as well.

And we took a novel approach with Kewaunee who has had some perennial substantive crosscutting issues. And the deputy of the EDO came out for a public meeting up in the Kewaunee area. So, we increased, and our program, the ROP, allows for this, and actually part of the lessons learned from Palo Verde -- inspection was reexamining that portion as well as to say do we have all the -- And that's part of the whole evolution of the ROP. We're always trying to look back to see if we need to make some enhancements based on our experiences.

MR. ABDEL-KHALIK: Abdel-Khalik. What happens if a plant stays in Column 4 for two evaluations in a row?

MS. PEDERSON: Help me, is it two they meet with the Commission or is it --

MR. SATORIUS: He said column 4.

MS. PEDERSON: That's the new one.

MR. SATORIUS: Column 4.

MS. PEDERSON: Yes. They meet with the Commission, that's the new enhancement to the program that they're expected to appear in front of the Commission at a public Commission meeting to talk about the plant performance. That's been an enhancement to the ROP that increased the emphasis on column 4 performers.

There is a fifth column, it's not represented here because we don't have any. Always back-dropping to this is if we have a belief that the plant is not operating safely, there is column 5 and that is the shutdown column. That is where we take obviously a very significant regulatory action, either to keep a plant down, maybe down or to order a plant down. So, the backdrop of all of this is the ultimate tool of shutting a plant down with unsafe performance.

MR. CALDWELL: There is no limit on the time you can -- Caldwell, there is no limit on the time you can stay in column 4. Obviously if there's a reason that they can't come out of column 4, we don't see them moving in the right direction, there

are other options we could take to deal with that. The Commission meeting is when somebody has been identified and called for, they come in and meet with the Commission right away which is a new thing.

MR. SIEBER: It's also important to note that, Sieber, that all this additional inspection is taxing on the licensee's organization. And that is much as anything or a civil penalty will get the licensee's attention.

MS. PEDERSON: Excellent, thank you. When in column 4, a plant enters column 4, there's a very, very large inspection that gets on. And that's taxing for them in multiple ways. They get charged for all those inspection hours.

MR. SIEBER: Right.

MS. PEDERSON: Probably more painful to them is having to interface with the agency. And, I mean, this is all to ensure the licensee is taking the right corrective actions to improve their performance so we don't have them continue to stay here.

MR. CORRADINI: So, let me ask my question, this is Corradini. So, let me ask my question. So, when we were down in Braidwood, there was a consistent conversation or consistent message

I heard which was, you know, we'll do it but it's great that Byron did it first so we learned how Byron did it, we did it then, or LaSalle did something. So, they kept on pointing to the other plants in the mix.

So, that leads me back to my question about safety culturing. So, Dominion just took over Kewaunee, Power Watch just took over Beach. I'm curious if you see because you mentioned Kewaunee which have been in some issues and they have come out of it. Do you see a change in how they perform based on the ownership and the connections to the different culture of management and engineering and emphasis? And so, where do you fit? I mean, I'm kind of searching for how the regions fits into that. Do you just essentially respond based on how these things are shaping or things are shaped.

MS. PEDERSON: We're looking at the plant performance level and that does get impacted by corporate policy and ownership. But they're all very unique, yes. Take the Florida Power & Light example. They're at Point Beach and we also have Duane Arnold. Very different in performance. So, we really focus at the plant level of performance.

Now, there have been some very unique

things with FENOC, First Energy, on safety culturing. We dealt with the corporate arena on that. But typically we're focused at the plant. And their plant safety culture can be influenced by corporate but they may not influence similarly such that we lump all of a particular licensee owner to one kind of culture. But they are influenced.

MR. SIEBER: That's an interesting point. First Energy operates four units. Two units have one kind of culture, the other two units have different types of culture. If you look at the alliance -- align themselves by exchange of people and ideas and sending them -- in Virginia Power where -- that's not growth or actively -- that's what formed a lot of the alliances. We did find a system plant that needed help or we needed help -- in the exchange of information, exchange of people.

And so, a lot goes on in the industry but fortunately NRC and the regional offices are drivers to get licensees to recognize where their problems are. Without the regional offices, the plants could take all different points of directions in terms of safety --

So, this is all very important. This is a key element to what NRC does.

MS. PEDERSON: One set of questions that came out in advance of your arrival did ask for a piece of that and that's the distribution of plants across the regions. And this is just a summary of that.

Crosscutting issues was mentioned earlier. These are the results of the last end of cycle meeting that we have through the Region III plants. You can see there are six plants with crosscutting issues and we've got them both in human performance and in problem identification and resolution. We do not have any plants in this region or the other regions that has safety conscious work environment crosscutting issue based on the last end of cycle results.

And I won't read all of this to you. We're already a tad behind. We'll try to keep you moving. But any questions on these areas?

MR. MAYNARD: Just a quick one, Otto Maynard, on the crosscutting issues, things like human performance. What process do you go through in one of those? I could find a human performance aspect with anything that goes off. And so, how do you sort out what's important and what's really a crosscutting issue versus --

MS. PEDERSON: What we try to do is focus to the best cause that we can associate with to find it. And you're right. And you have many causes that contribute so we try to look at the root cause as best we can identify it. And then we break it into various bins. Categories in human performance for example are decision making, resources, work control and work practices. Then under those components, they're even further defined into procedural compliance or planning and so on.

So, the inspectors, in working with their branch chiefs, try their best to hone in on what the current performance issue is because if the performance problem happened long ago and we don't think it's reflected in the current performance, we don't put a crosscutting issue aspect tied to it, even if there may have been one, you know, 15 years ago. We're trying to focus on the current performance. So, it's basically a process of looking to try to find the best match.

Anything else on that? Great. I'm going to turn it over now to Steve to talk about event response and initiatives. And then I'll come back for a little bit on challenges. Thank you.

MR. WEST: I haven't talked to each of

you today, so welcome to Region III. It's great to have the Committee here. And on the front of our package today, there's a really nice picture of the Region. It has just about everybody in the Region. It's a little bit dated but you can see kind of what the Region looks like. And I mention that because I wish you had the opportunity today to talk with everybody in the Region because I think you would find that like the ACRS we bring tremendous experience and background to the work we do and to the agency's mission.

And of course, one of the most important things I think we can all agree on that we do is event response. If there's an event that involves either a reactor site or a materials licensee, we are prepared to respond to it. And practically everyone in the region has a role to play in event response, depending on the nature of the response and the responses need for that particular event. Anywhere from the senior managers that lead, that manage the Region's response to the branch chiefs and others that manage the technical teams and the technical work toward the events, the engineers that help respond to the events to help us understand what's going on and what we should be looking for,

the administrative staff that are involved in helping us plan to, if we need to send out a site team, to plan travel, people that interact with the states, the other government agencies that are involved. So, it's really a regional effort.

And we're very proud of the effort that we put into event response. We consider ourselves to be very well trained. We have internal training that we do here in the region. We have training we do with other government agencies and others that are involved in event response.

So, we are well prepared. We do exercises that involve the licensees and the plants. And also in some cases headquarters in a full participation exercise.

In fact, we had an exercise earlier this week, a couple of days ago involving Prairie Island where we had a full base team assembled here in the Region and we sent a site team out to actually be at the site, work with some of the folks in the plant itself and some in the emergency operations facility for Prairie Island. I think Mark Satorius led the site team. I led the base team here in the Region. It's a great opportunity for us to really try what we know and we always learn from these exercises as

do the licensees.

We are going to have a little tour for you a little bit later of the incident response centers. We'll talk to you a little bit more about event response then. And actually this afternoon when we have our, after lunch when we have our ROP roundtable discussions, there are a couple of case studies that we wanted to share with you where we're going to talk in a little bit more detail about event response and some of those events that actually resulted in some follow up inspection activities. Cindy mentioned the special inspections, we've done a number of those.

Actually, if you look at the next slide, I'm not going to go through all these in any detail at all but just to give you a little feel for some of the events we responded to. Now, most of the time, when we have an event where we have to actually use our incident response center, we go in to what we call monitoring mode. Right now at this moment, we're in normal mode. There's no events going on that require our expressed attention.

But also when an event does occur at a plant, it's a little bit more complicated. There may be some issues that the licensee is still trying

to understand and we're trying to understand along with them. We'll enter monitoring mode. So that would be the first mode that we would enter above normal mode.

So, we have a number of examples here when we've had the monitoring mode this year. It's been a busy event year for us this year in Region III. I think last year was very light, this year we've had a number of events. Most recently, even the flooding in Iowa caused some problems at the Duane Arnold facility and we were in monitoring mode for a number of days. In fact, a couple of these events, the Point Beach, Byron, Duane Arnold, we were in manning our IRC around the clock for a number of days as we monitor the licensee's actions.

MR. SHACK: Did Point Beach turn off the --

MR. WEST: No, it did not. That was kind of an interesting event. Actually what happened was someone was going to be visiting the plant, the contractor. They stopped at a gas station to get some gas, and as they were leaving made an offhand comment about going to the plant to set up a bomb. And the woman that worked in the gas station was being a pretty good citizen, she heard

that and said, you know, I don't know if this guy is serious or not but I'll let the local law enforcement figure it out.

So, she called it in. They got his license plate number off some video from the gas station and tracked him down. It turned out that he thought he was being funny. But obviously he was not. So, we'll talk more about this --

MR. MAYNARD: Otto Maynard. Duane Arnold, during the flooding, did they continue to operate or did they shut down?

MR. WEST: They continued to operate. They continued to operate. Just to give you a little piece of the story on that one, that was interesting also. As you're watching the water levels rise and you're kind of thinking at some point if those levels kept rising there would be an impact on the safety system that would affect plant operation and they may have to shut down the plant. So, we were kind of prepared to do our thing in the IRC.

And actually Cindy and I were talking, sitting in the IRC talking about what else is going to happen. And we had learned that there was actually in the emergency plan condition that if

they lost their communications, that the licensee would have to declare an unusual event. And that made -- go with the monitoring mode. We were in the IRC talking with some of the staff about thinking ahead, you know, what would we do if they lose communications. And sure enough we got the call while we were sitting there that they lost their communications.

So, we went into monitoring mode. We found ourselves in a situation we don't like to be in where we don't have just real direct great communication with the plant. Now, we never lost communication with the plant but we did lose the satellite communication and some of their lines that are specified in the emergency plan. We were doing --

MR. SHACK: Right. I saw some of the site photos. It was --

MR. WEST: Yes, it was. It was very --

MR. SHACK: -- lose the power.

MR. WEST: Right. Right. So, they continued to operate at full power throughout and to this day.

The program initiatives --

MR. CORRADINI: Can I just get

verification? So, you said that -- Corradini, so monitoring mode is the initiating level where the incident response center would be manned or a person then watched?

MS. PEDERSON: Right.

MR. CORRADINI: And then special inspection, you said but I didn't catch it, that's more of a plan?

MR. WEST: Well, monitoring mode would be, we use our IRC sometimes without going into official monitoring mode. Our monitoring mode is a mode that everybody understands where we elevated our response to an event.

MR. CALDWELL: Monitoring mode, I'll just, monitoring mode is an agency action level. When we go into monitoring, the agency goes into monitoring. The region may monitor an activity, what Steve was talking about with the flooding, we were in our IRC monitoring the effects to the plant. But once they lost communications and went into an unusual event, we declared the agency in the monitoring mode.

MR. CORRADINI: Okay. So, it could be unofficial, but once they declare the unusual event then you --

MR. CALDWELL: May or may not.

MR. CORRADINI: Okay.

MR. CALDWELL: But in this case we did. We went into monitoring mode.

MR. CORRADINI: Thank you. What is beyond the monitoring mode?

MR. CALDWELL: The next is activation and expanded activation. Activation is when you put a team together to go to the site and they head off to the site. Expanded activation is when the site team, actually the definition keeps moving but I believe it's when the team is sent to the site and then eventually the team will take the lead.

MR. WEST: You also asked about special inspection relationship, and Cindy talked about special inspections. But normally when there's something unusual that happens at the plant, oftentimes there's an event involved but it doesn't have to be an event. It's I think by definition significant operational recurrence.

MR. CORRADINI: Most of this is post event?

MR. WEST: Post event. We do an assessment and decide what kind of follow up we need to do.

MR. CORRADINI: Right, thank you.

MR. WEST: So, it's not unusual for an event to result in a special inspection.

I wanted to talk to you about some program initiatives. Cindy and I here are talking together today because we really represent the reactor program. There's two divisions that work together. Cindy basically is responsible for the resident inspector program and the day-to-day operational issues at the plant. And DRS has the more specialist inspectors that are based here in the Region and travel out to the plant and do baseline inspections and other inspections.

We actually, we pretty much pride ourselves on our expertise and our proactiveness in becoming involved, finding issues, becoming involved in issues and staying involved until they're resolved. One example, it's not on the slide here, but last year the agency decided that we were going to do some material control and accountability inspections in all the reactor sites. This is an inspection that we used to do but had not done for a number of years. But in the post 9/11 environment with some materials missing at some sites, we decided to inspect all the plants.

In response to that, DRP last year took a very proactive role. As soon as we got word that the headquarters were looking to do those inspections, we identified folks to be in the teams to do it. We got them trained up. I kind of took the lead for the agency -- to kind of set the stage for how this should be performed. We had a very successful program that DRP completed last year. We found some issues that subsequently --

Some of the other things I wanted to talk about briefly are along the same lines. I can't talk about everything we do obviously in the few minutes we have left. But some of the more interesting things that we've been working on or currently working on, one is heavy loads. And maybe this is something that -- about but it's an issue that most recently basically originated here in Region III from our inspector's inspections of reactor vessel head replacement inspections. I think it was actually a resident inspector who --

MS. PEDERSON: Combined.

MR. WEST: Combined? Okay, combined talent. But our inspectors found licensees were lifting, so this is during the refueling outage when they had to remove the head and put the head back.

And inspectors were finding licensees were lifting weights in heights that were outside the bounds of the analyses that they had performed to show that these lifts and loads would be safe, or they had made changes to their procedures without changing their calculations to verify that they were safe. So, a variety of problems.

One of the immediate or near term outcomes of this was that the headquarters developed an issue with what they call a smart sample. And Cindy mentioned that the correction program is based on sampling. And usually it's the inspectors and the branch chief that are talking about samples that they want to look at in the inspections that they're scheduled to do. But in this case, headquarters developed the smart sample process where they said here is a sample that it would be smart for you guys to take a look at because there's some obvious generic implications to this issue, to the issue of the smart sample. I think since then that issue -- So, we did inspections using the smart sample.

Currently, the agency is working with NEI on an industry initiative to deal with the issues on a generic basis. And I think they're pretty close to coming to agreement with industry

and how we're going to resolve this issue through either agreeing on a method to do the calculations that will show -- or possibly doing an assessment of their cranes to show that they have single failure equivalency. And I'm not sure what that is but that's the process being taken.

This has been an interesting set of inspections for us. And Dave Hills who is here, he and his staff were doing a lot of the work on this with the residents. But this is activity, part of a specialized inspection of resources, so there's real structural expertise as needed to review these calculations. And fortunately, we have that here in the Region. And when the issue kind of started to bubble up, manipulated up as a generic issue, we were able to work with headquarters and the other regions to understand the issues and the implications. So, that was one of the challenges that we were able to overcome on this project.

And as you can imagine, each inspection is unique because all the plants are doing something different. And here in Region III, we decided that given the safety significance of potentially dropping a heavy load like that onto the reactor vessel or piping into the vessel, that we were going

to review, we were going to inspect all of these calculations or procedures for head lifts prior to the outages before they went into effect. We had a lot of interaction back and forth with the licensee which was actually one of the challenges.

There was a lot of resistance on the part of the licensees to deal with the issue. I've been lifting this head for 20 years, now all of a sudden it's a problem? So, it was very interesting from that standpoint.

Another thing that we're very involved in here is fire protection. I know some of you know I could probably spend the rest of the week talking about fire protection. Fire protection, I think you all know is a bit of a perennial issue for the agency and for industry. Recently I was asked to serve on a steering committee that was set up by the EDO. And I think we started work late last year to the end of this year. We just met with the Commission last week and presented a plan that's going to bring fire protection -- hopefully if you haven't seen that, you will be seeing that. But it deals with all the issues.

And of course a big part of that is many of the plants, the licensees are going to be

converting to NFPA 805 which is a performance based and risk informed alternative to the current fire protection regulations.

MR. SIEBER: Who's going to evaluate that?

MR. WEST: Who's going to evaluate that?

MR. SIEBER: Yes.

MR. WEST: It's going to be a joint effort between headquarters and the regions. It's still being, the details are still being worked out, but basically the conversion problem from the current program to NFPA 805 would involve a licensing review which headquarters does. There's also going to be some field work, some inspection and verification in the field. And the big part is looking at the, because this is risk informed, there's a PRA aspect that previously didn't apply to the current deterministic regulations.

We have been very, there's a couple of pilots underway in Region II. But we have been very involved, as involved as we can be in the pilot activities. Laura Kozak who is here, she's one of our SRA's, she'll be talking to you later this afternoon. We invited her to go along on some of the Region II activities, so she's been very

engaged. We're spending a lot, we're putting time and effort into training Laura, the other SRA's, and our fire protection folks to be prepared to handle the 805 transitions. I think about half of our plants, nine of the plants here in Region III have currently indicated that they will be converting to NFPA 805.

MR. SIEBER: Good luck.

MR. WEST: Thanks.

MS. BANERJEE: Steve.

MR. WEST: Yes?

MS. BANERJEE: This is Maitri Banerjee again. Steve, I was wondering if the staff is going to also address the -- recent fire effort.

MR. WEST: Which effort? The 805 or the --

MR. SIEBER: Fire protection in general.

MR. WEST: I'm sorry, yes. The plan that we presented to the Commission last week, one element of the plan is 805 so we talked about the plan's transition to 805. We also talked about other issues like the ones -- resolution of the fire barrier issues, the resolution of necessary measure issues. So, the plan is supposed to really cover the waterfront on the major fire protection effort.

Now, one thing I've noticed, I kind of was in fire protection for a long time and I got out of it sort of in '99. Some of you may even remember 15 years ago I came to the Committee and gave a presentation that we're going to develop this thing -- and now it's many years later. But I was going to say we had questions earlier about knowledge management in the presentation. One thing that kind of struck me after coming back into it after being gone for a number of years is that there's a real gap in the institutional knowledge I think right now, and not technical gap but gap in what the agency has done in fire protection and what's already been done and that we can move on, I see that staff now has gone back to -- revisited just because they know it has already been done. But I pass that on to the fire folks in headquarters.

I'm going to run out of time but let me just, I mean, we want to stay on schedule for lunch and everything. I'll mention just briefly materials issues. Again Dave Hills' branch, very engaged in materials issues. Probably the most interesting and pretty active one right now. And I think -- are we going to talk more about this in the afternoon?

SPEAKER: A little bit.

MR. WEST: We'll do it in the afternoon. So, we'll get a little bit more in the afternoon. But the main thing we're doing now is we look at the industry, our plants' efforts to deal with dissimilar metal butt weld issues. This is where you have a high alloy material welded to a low alloy material. And there is an industry initiative, you've probably heard of MRP 139 (Materials Reliability Program) which is establishing the guidance for that program. And it's intended to address the primary water stress corrosion cracking issue that's been found with I think in our welds.

And we're going to have lunch with you, too, so we may be able to chat some more about some of these issues. But I want to get through these all, they're all important. Security, we have a lot of attention on security. Most of what we do in security for reactors is official use only. We don't discuss it in public meetings like this. But we do have, as Cindy was mentioning, we do have baseline inspections -- security to all the reactors.

Again, getting to a Region III with our initiatives, something we took the lead for is Cindy and our folks working with the security folks in my

division developed guidelines for the resident inspectors to use to look at security kind of things that they have at the sites. And Greg Roach will be here this afternoon to talk about a day in the life of a resident inspector. He may mention a little bit more about that. But that initiative has been taken by -- headquarters and it's been exported to all the regions. So, that's just another example of our proactiveness here in Region III.

We also held, you probably all heard of the force on force inspections. We can't talk specifics about it in here but we, that's a program that's managed by -- out of headquarters. When there's a force on force exercise, they do a force on force inspection. And we send folks to support those inspections and serve on their inspection teams. Because those inspections sometimes become contentious, we often send a manager also for portions that -- branch chief that's responsible for the security or -- or Ann Boland, my deputy, myself. I think Mark is going to be going to one just to maintain order on the force on force.

Another activity kind of security related that you've probably heard of is B5B. This is the potential to lose large portions of the plant

due to aircraft head crashes or other bad acts. And the licensee is working on mitigation strategies for dealing with that which I developed and put into place. And we're now doing inspections and Region III took a lead role in that to organize the B5B inspection program. We did the first pilot plan here in Region III -- very good job. Exported lessons learned from that program which we shared with the other regions. That program is about half done here in Region III and will be done in Region III and all other regions by the end of the year.

Tritium, I won't talk about at all at this moment, I just want to get to our challenges. But we are going to have a full presentation on tritium this afternoon as part of the roundtable. I know there's already been some questions on that. We have Steve Orth, the team leader for our efforts to deal with tritium, who will be talking to you this afternoon.

And not on the slide but I just want to mention here, I know there is some interest in this. I think Frank is probably still interested in license renewal. Frank and I worked together in license renewal.

MR. GILLESPIE: And never missed a

schedule at the time.

MR. WEST: And never missed a schedule. But we obviously support license renewal activities here in the Region. There are some inspections that we have to do. I think most importantly, as important as inspections is that Jim Caldwell, our Regional Administrator, prior to having or agreeing to renew a license and signing that has to send a letter back that we've done an assessment here in Region III or inspection of the -- license renewal. So, we've had maybe a third of our plants have renewed license this year, three. Most of the others have submitted intent to request license renewal approval, and there's a few, probably the newer plants that we're still waiting to hear from. And --

MR. BANERJEE: Are any of your plants going through uprates, power uprates?

MR. WEST: I'm sorry?

MR. BANERJEE: Any of your plants going through power uprates?

MR. WEST: Some have and some are planned.

MR. BANERJEE: But nothing is happening right now?

MR. GREEN: Yes, there is. Davis Besse just went to 1.6 percent --

MR. WEST: This is Mark Green from, we need to make sure the recorder gets you.

MR. BANERJEE: How many EPU's then --

MR. GREEN: We have completed four EPU's in Region III, the last -- there aren't any other EPU's --

MR. BANERJEE: Another question if I may, there's been some concern about gas models falling in safety significant --

MR. WEST: Gas related, yes. Yes.

MR. BANERJEE: -- do they --

MR. WEST: Well, our inspectors, the resident inspectors and some of the ERS inspectors during some of our engineering inspections have found issues with voiding, actual voiding or potential for voiding here in plants in Region III. And some we have dealt with through the normal inspection and enforcement process. The licensee is making corrective actions.

We have found through our inspection that there is apparently not good agreement on the metrics used to assess voiding. And what we're seeing, it's kind of like the heavy loads, every

plant you go to they're doing something a little bit differently which presents a challenge to us. We work a lot with headquarters on this. And we recently have done one of these informal type of requests for assistance from headquarters to have this treated as a generic action.

And we're in kind of a process now, we have a white paper which we submitted to NRR which is under review. We've talked to the other regions to nail down an agreement that we needed to take a look at this as the agency and then -- But it is a potential issue.

Cindy and I wanted to talk for a few minutes, I figure we have five more minutes to talk about a couple of the challenges in the reactor program that aren't technical in nature. Okay, I'll go ahead. The slide is backwards but Cindy is going to cover staffing and I'm going to cover communications. So, here I'll go ahead and do that.

One of our, like I have on here, communication is a challenge. And I mean that in the sense that communications is, effective communications is something that is very important to us as a region, to everyone in the region. And it's something that we need to be constantly mindful

of the importance of communicating effectively, directly and at the right time to the right person, et cetera. And for us, that means not only to people working outside the agency but even inside the agency, even between Cindy and myself or high branch chiefs and some of these branch chiefs. We put a high premium on communications and doing it effectively.

But it also obviously involves all stakeholders. And we're going to talk about tritium later, some of the technical details. But tritium is a good case study of how to either make communications good or bad, I'm not sure which. But it is just unbelievable what all this involved in the communications of the tritium issues.

There have been a lot of issues, we got communications internally within the region on tritium issues to help people understand. You would think something, you may not think this but some of us may think this is something that really is not particularly safety significant and should not be a big deal. But to the people in the community around Braidwood where -- this is a big deal. And if it's a big deal for them, it may be a big deal to their representatives in Congress, in the Senate.

So, we've been trying to handle communications with tritium effectively. And I think we've done a pretty good job. It involves the staff here, the staff at headquarters, the Commission, the external stakeholders, the community members, the licensee. Steve and my division and our public affairs officers here in the Region have done a tremendous job of going out and developing some communications.

One of the things with tritium which makes it a little bit more challenging for us is that we don't believe that Exelon is doing a particularly good or effective job in reaching out to the community and explaining the issue and what they're doing about it. So, we've kind of had to take on part of that role which we don't really want to do but we do it. So, we attend community outreach meetings that are organized by Exelon or other public interest groups in the area about tritium program at Braidwood --

MR. ABDEL-KHALID: This is Abdel-Khalid, ACRS. Why do you feel the need for you to take the lead in that role if the licensee is not really doing the job? Is it a part of establishing your credibility with the public?

MR. WEST: I think credibility, first of all, I wouldn't say we take a lead for the licensee. We're not taking the lead for the licensee. But the licensee and their communications, there may be gaps that we've been filling in as we go along. But we, I mean we do, it is a credibility issue and it's also a matter of public confidence. A lot of the criticism on the tritium issue is directed directly at us. So, by the nature of the complaints, we need to respond and help the members of the community understand what the regulatory requirements are, why they are what they are and what our role is.

We had talked to you earlier about using headquarters support. This is an area where we've gotten a lot of support from headquarters. We got support from research. We had experts in health effects come out and meet with us in these community meetings to help explain why our regulations and standards are what they are and why they're not changed willy-nilly.

And so, it's a tremendous effort, one that we take really seriously.

MR. CALDWELL: You asked a good question. Our communications and our approach is to get the public to gain confidence in the agency, not

in the licensee. It may ultimately cause them to gain confidence in the power plants' approach to things but it's, we want the public to gain confidence in us that we're doing a proper oversight job. So, it's still the licensee's responsibility to get out and tell their story for the public to gain confidence in them. But we're working to try and reassure the public and to get them to be confident that the NRC is doing its job and we're ensuring that they would be safe from the use of radioactive materials.

MR. SIEBER: Actually the public looks to this agency as the protector of their safety.

MR. CALDWELL: Right.

MR. SIEBER: And that's the main obligation that it has. If the public loses confidence in the agency and Region III, then there's major political problems, major regulatory problems --

MR. RAY: This is Harold Ray. I asked Cindy to talk about this one and I understand -- but just one thing I got to say. To me this isn't a tritium issue. It's an unmonitored release of radioactive effluent in an area that it wasn't supposed to be. And that's the starting point it

seems to me for lessons learned values. It turns out it was largely tritium but that's not the point.

MR. CALDWELL: Right, it was a monitored release but it went, it was supposed to go to the river and it bypassed the river to the ground.

MR. RAY: Well, it was a release from the vacuum breaker, Jim.

MR. CALDWELL: Right.

MR. RAY: And that's not where it was supposed to go.

MR. CALDWELL: No, it's not. And in fact, the regulatory action we took when we cited the licensee was just that piece there.

MR. RAY: Okay. But that's the point is the damn thing was released to the wrong place and it wasn't monitored. Now, we reached our, I mean that's where our story starts.

MR. MAYNARD: Otto Maynard. And back to communications part of it, I certainly understand it's in the licensee's best interest to communicate with the public and it certainly makes your job easier and better when they do an effective job. But I guess I have it a little bit different because I really do see it as the NRC's job to communicate with the public on the regulatory issues. So, the

NRC is really -- to the public. The licensee, it's in their best interest to answer to the public in these things but it's really the NRC that has a communication responsibility to the public -- about the process.

MR. WEST: Yes, I just meant we were trying to get the public to gain or keep confidence in us. We're not trying to get them to gain confidence in the licensee. That would be their responsibility.

MR. CALDWELL: -- I didn't notice Christine was here. Christine is our MCNA -- I want to recognize Christine.

MS. PEDERSON: We're just a tad behind so we'll try to make this short but everything you've heard about thus far today and everything you've going to hear about for the rest of the day really revolves around our people. And so, that is a continual focus and continuing challenge for us is to make sure we've got the right kinds of people with the right kinds of experiences and backgrounds and in a productive environment such that we can do the good work we've been doing.

So, a challenge for us is to continue to maintain high quality people and enough of them to

do our work. And the challenge for us has been, we are, as we've mentioned earlier we receive some turnover in staff. We've got a workforce who'll be seeing some -- we're also seeing a number of our people being recognized for their skills and their abilities and they're getting promoted. It's great for them but it also leaves us with an inspection hole some way down the way.

So, there are a couple of areas that we're looking at and we're participating with the agency on retention and recruitment for resident inspectors. That's one big area we're working on. But also the region is looking for other areas of technical expertise that they're recruiting for. And so, we're looking always to have a mix of new people coming out of school and a mix of experienced people. You can't go one way only so we try to get the proper mix.

The agency initiative focused on resident inspectors. As we know, they're our first line of defense. They're our eyes and ears. They're the folks that are in the field available to respond. And back to the public confidence, they live in the community so they provide both a public assurance piece as well as highly skilled resource

for us.

So, giving -- to the resident inspector positions, we have noted a couple of things that maybe were disincentives to that. They're actually of such importance to the agency that the deputy regional administrators have formed a group in highlighting certain areas that we need to tackle and plan to incorporate to solve one of the three thus far. There was a pay disparity issue for folks that went out to be resident inspectors before they were a Grade 13. And we've resolved that. That just happened very, very recently so I'm glad to say we've got pay parity for folks that go out before they're a Grade 13 or as a Grade 13.

Also, we've had a few experiences where because of locality pay people have gotten a promotion but actually lost pay when we went to the next site as a senior resident. That didn't seem right, so I'm glad that we fixed that as well.

A couple of other areas that are still actively being worked. One is a very broad area of insurance. People know the resident inspector program is just a great career path and valued for what they do and the important role they play in the agency. A new working group is being formed for

that activity to generate some more ideas to see if there are some incentives that can be used to help enhance getting people out into the field.

The third area that the agency is looking at for resident inspection recruitment and retention is what we call our pool in Region III, but it's the way in which you fill the feeder spots to go out to be resident inspectors. Region III has been very successful in bringing people in with the expressed knowledge that they will become resident inspectors. We bring them into the Region as a reactor engineer, we train them, and then we have somebody trained and ready to go out to be a resident when that opening occurs.

It's been very effective. We shared that best practice with the other regions. The other regions are looking at something similar to that. And so, we'll continue and always continue to fill that pipe line for us.

Now, what would be nice is if we actually had the budget to make this work a little bit better. We tend to over-hire into that position so we get people trained and ready to go out. And it would be helpful if, I don't know if you guys have any influence on the budget but, sorry to do

that, but that is something that we struggle because we're held as any responsible organization is to live within a budget or within variations of that budget. And this is an area where we would benefit from over-hiring, just as other disciplines, I'm shifting out from the agency initiative to other areas.

We also would like to over-hire into other areas. The operator licensing, it takes a couple of years to get people to get qualification to the program whether it's design engineers or HP's or in-service inspection people. Our goal is to always stay overbudget but not too far overbudget. So we always get the number a little higher.

But key for us is to ensure we've got the right people who will be doing the right kind of work when we need it and we've been quite successful in doing that. But that's an ongoing challenge that we're always focused on.

And any questions while we wrap up this portion and move on to dry cask storage? Sarah is here. Thank you. Sarah, would you like to address, Sarah Bakhsh is available for, excuse me, ISFSI.

MR. CALDWELL: While Sarah is coming up, I'll mention one thing. In the materials program on

initiatives, Dave Hills, I don't know if Dave is still here, Dave, when we started having all these materials issues, he initiated a call with the other regions and headquarters, correct?

MR. HILLS: Right.

MR. CALDWELL: So that we could learn from each other and be consistent in how we're creating these new things as they crop up. And I think it's now, NRR decided to institutionalize that. So, they now have the lead. But it's another good initiative on our folks' part.

MS. BAKHSH: Good morning. I'm Sarah Bakhsh, I'm the lead ISFSI inspector here in the Region. I'll be referring to the independent spent fuel storage installation. And I'll be describing briefly the inspection program that we have here in the Region. This presentation is a very brief overview. Any questions along the way, again --

The independent spent fuel storage installation or ISFSI as I mentioned are inspected by our regional offices. And in Region III, we are under the Decommissioning Branch which is in the Division of Nuclear Materials Safety. The purpose of these inspections is to ensure that the licensee is in compliance with the 10 CFR Part 72, both

general and specific licenses, the FSA, the final safety analysis report, the certificate of compliance and the associated tech specs, technical specifications.

Our inspections can be summed in four general phases which encompasses the beginning phases, beginning of the pad construction and the associated modifications to the NRC dry run demonstration and the actual loading of fuel from the cask, the risk that we have in Part 72. Here you see a beautiful picture of us hard at work -- crane inspection.

A brief summary of the Region III ISFSI sites, currently, Byron and LaSalle are constructing their pads Kewaunee has completed but they haven't entered the pre-op testing so they're kind of in both phases right now. They've completed the construction of the pad but they have a little bit of work to do on their crane. The pre-op or what we refer to as the dry run inspection, currently is scheduled for Monticello in a couple of weeks and then Kewaunee in the beginning of next year.

The operating, there's a list of operating, what we call ISFSI's. Big Rock Point still retains their Part 50 license but they just

have the pad with the storage casks on there. And then, GE Morris is storage only in the pool, that's spent fuel in the pool, it's wet storage. And then, this year, Palisades, Prairie Island, Quad Cities will also be loading but they've done their initial load so this is a routine loading done this year.

Future sites that plan to go to the general licenses ISFSI include Braidwood, DC Cook, La Crosse, Zion, Fermi and Perry.

MR. CORRADINI: Corradini. So, these are independent licenses from any plant that might be on a site either nearby or literally co-located?

MS. BAKHSH: The only one that's not, the only one that's away from the reactor is the Big Rock Point. That's the only --

MR. CORRADINI: Okay. So, if I can just pick on so I can get a feel, Kewaunee is sitting on one side of Route 32. Where does the ISFSI go? It has to be co-located or can it be away from the reactor?

MS. BAKHSH: Well, in this case, since they have the Part 50 license, they would just have a general license for the ISFSI and have that either within the OCA or outside the OCA per their design. It would be at that site though.

MR. CORRADINI: Okay. And then if it's outside the OCA, what do you do relative to transport between the OCA and the pad?

MS. BAKHSH: Well, there is a, well, see, that goes more into security now since --

MR. CORRADINI: I was going to ask about that eventually, too.

MS. BAKHSH: Yes, but there is what they call, depending on the design that's used, and the most common which I was going to get into a little bit later --

MR. CORRADINI: That's okay then. If you're going to get to it, we can just wait.

MS. BAKHSH: But I mean I'll go briefly over the process. There is what they call a transfer trailer that they use to put the cask on to in this transfer cask and move that from the reactor building to the pad. And that's how it gets from point A to point B.

MR. CORRADINI: And point A and B can be up to how far a distance to use that technique?

MS. BAKHSH: There is no specified --

MR. CORRADINI: Oh, there isn't?

MS. BAKHSH: No. It's usually, I mean within half a mile, quarter of a mile, that's what

we've seen. But I haven't seen anything that specifies the maximum distance.

MR. SHACK: Shack. Are these transport casks licensed to go on high density --

MS. BAKHSH: No. They are not, no. They cannot be transported on public highways.

MR. SHACK: So, they would be only within the site.

MS. BAKHSH: They're only within, yes, they're to be used at the site. They have to, if these ever were to be shifted to let's say Yucca Mountain, they would have to be taken out of their storage, the homes that they're seated right now.

MR. SHACK: But how did they go out to point B? They loaded it, they transported it to another site?

MS. BAKHSH: Yes, but it was still before they decommissioned.

MR. SATORIUS: Yes, it's still on the Big Rock site. There is nothing else there now.

MS. BAKHSH: Yes.

MR. SATORIUS: Just the pad in the --

MR. SHACK: Oh, I thought they turned that into a green --

MR. SATORIUS: Well, everything but.

MS. BAKHSH: And these are all general license, they have general licenses except Prairie Island and GE Morris have specific.

MR. CORRADINI: So, let me just, one more shot because all of this is interesting to me. And so, if it's strays you off the path, just tell us and we'll wait. So, I'll take again Kewaunee as an example. They're a relatively isolated site. They have very little -- on the east side of Route 32. So, my guess was that they were somewhere across a public road. So, if they had to cross public access --

MS. BAKHSH: They don't.

MR. CORRADINI: Okay. But if they did, do they require some sort of different licensing procedure?

MS. BAKHSH: Yes, because then we would have to use the transportable cask over public highway and that would have to be fabricated.

MR. CORRADINI: Even if they had to cross it?

MS. BAKHSH: Yes, at any time.

MR. CALDWELL: So far, I don't know about the other regions but all of our sites, they're located either, there are some in the

protected area, there are some out. It's just whether they have the area that they can develop for the pad. But they are all located near the site.

MR. CORRADINI: And then my only last question is as to security but if you're going to get to that, I'll wait.

MS. BAKHSH: I wasn't going to discuss it here. I can help you out there.

MR. SHACK: A question about Morris. You said they're still loading the course?

MS. BAKHSH: No, they just have pool with the spent fuel in it. It's wet storage.

MR. SHACK: Wet storage.

MS. BAKHSH: Yes.

MR. CORRADINI: And there is no dry storage capability there? And no plans?

MS. BAKHSH: No, they have no plans.

MR. RYAN: Ryan, ACRS. Would you just get a little of the -- between specific or general licenses?

MS. BAKHSH: Well, from our understanding, it's more, general licenses go easiest where, because they already have their Part 50 and they just kind of try to incorporate the Part 72 to the general licenses. A specific license

requires hearings. That's, I mean, Big Rock Point for example still maintains a Part 50 which, I mean they don't have a reactor but they still have a Part 50, they -- that process better than having --

MR. RYAN: So, the Part 50 is really the driving --

MS. BAKHSH: Yes.

MR. RYAN: -- with general license. If they don't have a 50, then they --

MS. BAKHSH: Yes. Any other questions on this? Okay. And just the forming stages, I'll go over briefly. We begin with onsite observations and this also includes interviews of staff and a review of documentation. The first phase is the pad construction. And this involves, this is the first phase where the licensee chooses what site they want this pad constructed on. We start with in-office review of the design documentation and then subsequent construction activities from excavation, backfill, the placement of the rebar and then the placement of the concrete.

The second phase is the pre-operational phase or what we refer to as the NRC demonstration that the licensee performs prior to the actual loading, what we call the dry run. This part is a

very involved part of the inspection program, and thus we conduct some very detailed review of many aspects which include again compliance with the regulations, the review of their pre-operational procedures before they finalize into actual loading procedures, testing of equipment, radiation protection. Heavy loads inspection comes into the -- cranes, especially nowadays you'll see a lot of updates to cranes and similar -- Emergency preparedness, maintenance, surveillance, environmental program, they are administrative procedures and those are some of the main topics.

The spent fuel loading and unloading, after the dry run, the licensee plans the next phase which includes loading the actual fuel into their canisters. And here we observe the demonstrated activities, fuel selection and characterization process, review of the loading package which includes operational procedures, their unloading procedures in case of emergencies, in-depth interviews with staff and -- documentation review which includes their condition reports, crane maintenance documents, 72.48 which are similar to the 50.59.

There's numerous approved cask designs

that the licensee may choose from. There's a couple of pages of listing in Part 72. And the two main ones that we see here in Region III are the Holtec which is the vertical, I have a picture I can show you at the very end of the presentation. Holtec which is vertical and then new homes which have horizontal. Did I say vertical, I mean horizontal.

Okay. And then the last phase is more of the storage monitoring. So, the casks that already exist on the storage pad and for some of the, like Point Beach let's say for example, they're not planning on loading for the next couple of years, we've performed routine inspections of the licensee's surveillance and maintenance activities which includes some of the -- the environmental quarterly reports, their training -- maintenance, the condition reports, 72.48, and their daily and quarterly, usually quarterly surveys of the casks that are out on the pad.

And then this is the horizontal new homes version. This one sits in this concrete bunker right here, and it's inserted. This is the transport cask and this is what they use to take the inner cannister into the site and insert into the horizontal storage module.

MR. CORRADINI: That's typically how many --

MS. BAKHSH: It depends. It can be 24, like Palisades -- 24, they're 31, 61 if it's a boiler. It depends --

MR. CORRADINI: Thank you.

MS. BAKHSH: And then the other module is the Holtec. And for the Holtec and NAC, if you've heard of NAC it's similar. They're vertical. It can be from like 13 and 15 feet tall.

MR. ARMIJO: Do they have -- sorry, I have a question. This is Armijo. For all of these things, is there a maximum for the clad temperature requirement?

MS. BAKHSH: Yes.

MR. ARMIJO: How do you ensure that that --

MS. BAKHSH: The fuel temperature?

MR. ARMIJO: Yes.

MS. BAKHSH: Well, there is a minimum, like a minimum requirement for the cooling time which is five years for the fuel. And then each cask has a heat load capacity, say it was 24 kilowatt for example. And so, it's done by calculation and each fuel assembly that's put in

there, that's put like into a plan with the hotter assemblies in the middle and then stay with it and then each cask will not exceed that --

MR. ARMIJO: But the calculations, is there a margin on it when you say --

MS. BAKHSH: Yes. And then per their plan, that's what makes up that review. They go to each fuel assembly and take out those assemblies.

MR. ABDEL-KHALID: But there is no measurement, I guess is what Sam is getting at.

MR. ARMIJO: That's right.

MR. ABDEL-KHALID: It's not measured, it's calculated.

MS. BAKHSH: It's calculated.

MR. ABDEL-KHALID: So, what's in the surveillance reports? I mean you indicated there are surveillance reports.

MS. BAKHSH: Surveillance is meeting their, let's say if the cask is sitting out on the pad, depending on the design, they have vent and screen checks, temperature checks, just general checks of the pad. They do these on a daily basis. Some they have quarterly, other additional requirements quarterly, that's what I meant by the licensee's surveillances of the conditions of the

pad, the casks that are on the pad.

MR. ABDEL-KHALID: So, there is no continuous monitoring of exit temperature, for example, from the vents or --

MS. BAKHSH: Well, there is depending on the system. If it's a new home system, because there are different requirements for each system, so let's say for the new home system, the horizontal ones, they do have requirements to double check the temperature. They can't exceed let's say 100 degree Fahrenheit. That's not a measure, I guess that's not, it relates back to --

MR. ABDEL-KHALID: It's a global one.

MS. BAKHSH: Yes. Yes.

MR. BANERJEE: Some of these are -- or all of them?

MS. BAKHSH: Yes, they're all --

MR. BANERJEE: How do you check that that is --

MS. BAKHSH: It's called a vacuum drying system. And this is done inside the reactor building when they're actually, they've loaded the fuel, they've drained the water, they've removed the -- water and they now use the system again which are tight tolerances that allow for that pressure. They

drain and then backfill with helium, and that has to maintain it as a whole for a certain amount of time. Then they seal the vent -- that the helium has allowed --

MR. BANERJEE: They have a way to ensure that this --

MS. BAKHSH: Yes.

MR. BANERJEE: They check that?

MS. BAKHSH: Yes, they check. They have a human zipper they call it. Yes.

MR. BANERJEE: Is there any temperature monitoring that's done at all other than this --

MS. BAKHSH: Temperature monitoring? There is no direct, it's just from via the heat load.

MR. BANERJEE: Right. But that is used when you've loaded the right fuel.

MS. BAKHSH: Yes. And there's, I mean there's a lot of checks. Double or triple checks on the fuel assembly that go on. And then they actually take a video of the fuel assembly. We verify that also after.

MR. ARMIJO: Can you store effectively -- is there a special --

MS. BAKHSH: There's special

requirements. There has to be less assembly. They are allowed to load damaged fuel. They haven't so far. Some of the older ones may have but currently they are allowed to store them and in that case the cask has to be designed for that purpose which includes more shielding and less assemblies.

MR. CORRADINI: So, one last question back to temperature. So, I don't remember what the limit is but let's say it's 300 C just to pick a number. And we're looking at 50 C outlet temperature that's measured. So, what is the typical factor of safety or margin between what is the limit and what is the hot spot in some of these assemblies?

MS. BAKHSH: Well, that's where the administrative procedures come in. Usually their own administrative procedures have a very low threshold for the, their temperatures in the certificate of compliance tech specs, they're never that high.

MR. CORRADINI: But I mean just to give me a feel, the limit is what?

MS. BAKHSH: Let's say it's 100 degrees for the exit temperature in the horizontal storage module, so you're saying if it's --

MR. CORRADINI: Well, I'm just trying to understand what is a typical peak operating temperature in the cask versus the design limit.

MS. BAKHSH: Oh, like how high they probably get to?

MR. CORRADINI: Yes.

MS. BAKHSH: Like 70 degrees Fahrenheit on a very, very hot day.

MR. CALDWELL: You're talking about inside the cask?

MR. CORRADINI: I was talking about, you answered my question on the outside. But I'm still back at the cladding.

MR. CALDWELL: We can try to give you that answer but some are based on the design of the cask itself, and the temperature, external temperature would tell you based on that design of the cask.

SPEAKER: We want to know what the acceptance limit is for the cask for the cladding temperature I think and the typical temperature that you actually get.

MS. BAKHSH: And that's all taken into account when they design the heat load for that particular cask.

MR. MAYNARD: What is the number? The number, and correct me if I'm wrong but I think it was 400 Centigrade cladding, back to the cladding temperature. Then you calculate down to the margin that -- we're just trying to find out how much margin --

MR. CORRADINI: Is it 200, is it --

MR. MAYNARD: Yes, right.

MS. BAKHSH: I can --

MR. BANERJEE: I don't think -- it depends on the fuel you're storing. What I understand from you is that it's a whole administrative control procedure for loading and stuff. But there is no post-loading direct validation somewhere.

MS. BAKHSH: There is no way to measure the actual cladding temperature --

MR. BANERJEE: Of the cladding. But even if you measure the inner wall, the concrete or something, there is no embedded --

MS. BAKHSH: There's measuring devices. It depends on the system. Some systems require it, some don't. For the FSAR -- or Holtec. For new homes, there is a thermal coupled on the outside of those bunkers. So, they do, again we're back at the

outside, the outer temperature though.

MR. BANERJEE: But there is nothing embedded in the concrete?

MS. BAKHSH: No.

MR. MAYNARD: Otto Maynard -- administrative procedures, so it's really in the regulations of the design module that they have to be, that they have to design these things.

MR. CALDWELL: These are certified designs by the agency, so all the questions you ask have been taken into consideration. And never do we say it can go up to, whenever we license something, it's got a bunch of margins in it. So, we can't answer as to what that margin is but we can find out for you if you need it.

MS. BAKHSH: Okay.

MR. BROWN: For the neophyte which I am, I asked this question already -- Charlie Brown, sorry. In the pictures and I'm looking at this thing with all those nasty stuff in it sitting out here on an open concrete bed getting rained on, snowed on, hailed on and everything else. And then you mentioned something about -- and now this other thing looks like a mausoleum that under they shelve these cylinders in, the bunker. So, some are

bunkers and some are not.

That to me, I mean just not having any idea of what I'm talking about -- that seems to be diametrically opposite from -- I realize we have all the regulations there and it's all per standards and all that kind of stuff. But why the difference in storage for the vertical ones and the horizontal ones?

MS. BAKHSH: Well, this right here is just the outer concrete storage module. It's just a little more visible. What you don't see in the vertical one is that these are concrete canister, I mean concrete overpass within which the canisters are sitting. So, it's equivalent to the --

MR. BROWN: So, what I'm seeing here then is if I took the side off I'd see the cylinder inside of it. It's just a smaller bunker --

MS. BAKHSH: I mean if I cut this --

MR. RYAN: The difference is one -- vertically and one horizontally.

MS. BAKHSH: Yes.

MR. BROWN: Yes, I don't know which one is smaller.

MR. RYAN: One looks huge and this looks tiny. I could back up my semi and get a crane, toss

one into my semi --

MR. CALDWELL: I don't think you can do that but they're similar in, I don't know if they're similar in size but really similar in design. Do you know what the circumference is?

MS. BAKHSH: Not exactly. Okay. Anything else?

MR. WEST: It's not as small, I don't know how much they weigh, but that's not a small --

SPEAKER: -- if a human was standing there.

MR. CALDWELL: I'd say two, two and a half meters in diameter.

MS. BAKHSH: Yes, these are about 13 to 15 feet tall. I just don't, I don't know the diameter of the concrete overpass.

MR. BROWN: I don't want to focus on that

but --

MR. CALDWELL: No, that's okay. We'll get you the answers though.

MS. BAKHSH: Anything else?

MS. PEDERSON: Thanks, Sarah. I think we're running just a tad behind. But next is to have a short break and then congregate over at the

incident response center for the tour. So, we'll take a short break, we'd appreciate it. And then kind of walk this way, we'll take you into the incident response center.

(Off the record for break and tour.)

MR. KOZAK: All right. I hope you had a nice lunch. We're going to get into reactor oversight process roundtable now. We have a number of specific issues we want to cover for you. Our first talk will be the senior resident from LaSalle, Greg Roach, who I've met yesterday. Greg?

MR. ROACH: My name is Greg Roach, G-r-e-g R-o-a-c-h. And I am the senior resident inspector at LaSalle Station. Previous to that, I was the senior resident and the resident inspector at Braidwood Station, so I've had the opportunity to serve at both the pressurized water reactor and boiler water reactor which is obviously great as an inspector for well roundedness. So, it's a good thing for myself.

So, we'll go ahead and move forward into the resident inspector area. And following myself, Mr. Holmberg here will be giving a presentation on the Byron essential service water finding issue.

And then we'll all discuss the issue with Perry and digital feed water I&C, the tritium at Braidwood and some operating experience in Region III.

Okay. What are the main jobs of a resident inspector? First, I like to say we are the eyes and ears of the agency. We are the folks that are onsite during the week everyday, turning over with the shifts in the morning, working through, observing the various different activities that are happening onsite. We're going to go ahead and actually look at some of the areas that we focus on. But as the eyes and ears, we're looking at all the big ticket items.

When you show up to work whether it be in the morning, in the middle of the night, whatever it is, you're getting an assessment of the site and you're determining what is it that's going to challenge LaSalle today. And I like to be part of the briefings and then the actual activity and then the cleanup afterwards to make sure that the whole process went smoothly. That could be in the form of observing meetings. That could be in the form of being out in the plant. That could be in the control room while evolutions are taking place.

We implement the baseline inspection

program as dictated by the reactor oversight process. We do a daily corrective action document review. And that's really a fundamental in our understanding of what's happening at the plant is going through, looking through the corrective action program documents, not only to say what is the issue but in how is the licensee classifying it, how are they dealing with it, what's the prognosis for fixing the issue, are they just, you know, pencil whipping it off or are they actually going to address the issue and following through with that. And then we'll actually look at how the Byron issue stemmed from part of that corrective action and interface with the licensee review by the residents.

Okay. This gives you a general feel for the daily schedule of a resident inspector. We arrive onsite at approximately 6:15 in the morning and then we'll begin our plant status review. That's including looking at what are the main condition reports that have come out overnight. We're looking at what is the actual plant status as far as for all the main parameters for the site. We're looking at what are the job items that they have completed overnight and what are we going to be doing this next day. And then we'll read all the

operators' logs to make sure that basically the plant has been operating in accordance with the technical specifications.

At that point, one of the residents will go to the main control room and they will attend the shift turnover brief with the senior reactor operators. And then they will walk down both units' panels to observe all the positions of the main operating equipment and make sure that the units are again being operated in accordance with the technical specification. At that point, we'll come back and we'll make a conference call back to the region and pass on all the pertinent data for the activities that have happened and will happen over the next 24 hours at our site.

As you see, as the day goes on, we attend the Plan of the Day meeting which is the licensee's main management meeting. That's the site vice president, their plant manager and all the direct reports. And we basically go through the plan of the day which is again an overview of the plant status from the licensees perspective. From that meeting, we're actually coming away with what is their intentions on dealing with the plant and maneuvering the plans within the next 24 hours.

Then we begin our inspection activities obviously in accordance with that plan, we're looking ahead. We have a couple of documents that we receive from the licensee. We have a work schedule. They were able to look ahead and see exactly when they plan any major maintenance outage windows. And of course you have the emergent paths that come up each day as we attend the licensee's planning meetings to say what kind of issues that have been scheduled that were, you know, not part of the normal 13-week maintenance schedule. And then we'll go ahead and fit that into one of our inspection modules and perform the inspection.

In the afternoon, we get a package with all their management review committee document which basically highlights all the condition reports that have been received over a 24-hour period. And then it goes through, their station ownership committee has now reviewed this document and they have assigned it a particular alphanumeric designation which determines what their response is going to be to that particular issue. So, we look at first what the issue is again, we re-read that. We look at how they've classified it, and then we go ahead and see what their tasking is for this particular group.

If it's an issue that raises to the level of a root cause or an apparent cause evaluation, then we'll go ahead and with one of our modules, typically the operability determination module depending on where it fits. We'll then go ahead and review that document when it comes out. And then again, inspection activities for the remainder of the day.

Now, this is a prototypical day. Obviously as a resident inspector, our job is to be, let's say a surprise to the licensee. So, some days that means I'm coming to work in the middle of the night and observe their night shift. We do backshift hours, we're obligated to do 50 hours a year of backshift. That's broken down such that we achieve at least 12 and a half hours a quarter so you don't want to have it all front-loaded or back-loaded so that it's spread out through the year.

We always go over 50 hours and that's typically because there's always going to be an outage each year whether that be, you know, for a PWR then you may have two outages in a year. A BWR typically just one a year. But you'll certainly exceed the 50 hours per year with an outage because you're doing a lot of backshift work since there are

a lot of major undertakings that happen at all hours of the day of the prevailing outage.

Okay. These are the inspection modules that the resident inspectors focus on. There are other baseline inspection modules that are being supported by the regional staff that I didn't list in this particular slide. One thing to be aware of, obviously when we do our corrective action document reviews, we're also looking at those items and we're calling the regional experts if we have something that we feel is not in accordance with the ROP for those areas and everything. You get the expert, whether that be in emergency preparedness, radiation protection and security from the region involved, and then they could follow up as part of their inspection or give us guidance on some things that we should be looking at.

MR. ABDEL-KHALID: Are there any missing inspection modules that would have allowed you to sort of detect the tritium problem at Braidwood early on?

MR. ROACH: The actual, as far as the tritium issue is concerned, since that was a part of the discharge and basically their liquid release program, first that would have failed under our

baseline inspection program under the ROP area. Now, as far as from how they control releases and staying within the guidelines of meeting 10 CFR 20 for release concentrations, that was not obviously impacted here. From the material condition, actually going out and looking at the blow-down line and whatnot, there wasn't a particular module that existed that would have said inspectors go out and verify that the material condition of the blow-down line is in order.

At this point, I would say that we are looking at the blow-down line as a management expectation. We do it monthly to look at the integrity of the blow-down. The licensee has created procedures for their own review on a much more frequent basis than they were doing before which was effectively never. So, right now we're operating under an expectation as residents at Braidwood to go and look. But there isn't a procedure that says look at the blow-down line material condition. It's non-tech spec --

MR. ABDEL-KHALIK: I guess my question was meant to be more generic. In retrospect, do you think there should be an additional inspection module added to this ensemble here that will allow

you to prevent incidents of this type?

MR. ORTH: If I may add, my name is Steve Orth, and we talked during the incident response tour. One of the areas I'm responsible for is the radiation safety inspections at each of the sites. And one of the modules we do have on there, we have had in that area that we look at on a biennial frequency, every two years, is their effluent release program. And one of the areas, in the past there was a very small kind of a pointer to look for unmonitored or unplanned releases. Since the events with the groundwater contamination, that has been largely expanded to provide additional direction to our inspectors as to what to look for, what kind of response to look for in terms of the licensee that we basically in the past would have relied on an inspector's judgment to kind of pick up on. But it's now a more focused response.

MR. BLEY: Excuse me, Bley, ACRS. Were you able to generalize that guidance or is that particularly at the blow-down line?

MR. ORTH: It's generalized at systems and components that have the potential for groundwater or leakage, underground leakage, leakage that you wouldn't be able to visually detect.

MR. ROACH: And from a resident inspector side of the house, looking under the PIR 71152, problem identification and resolution, part of our corrective action document review, there's two-fold things that I will say that happened here as part of this, you know, particular issue. One, these leaks occurred, these were pre-ROP.

And the other thing is that these were also pre, we'll say database computer access to problem identification resolution documents which as an inspector makes our intrusiveness dramatically greater to the licensee because I have a real time view of all these documents that are coming in to look at and say, hey, this is wrong, this is a material issue that needs to be addressed. And even if I don't have a particular something that fits nicely into a -- I'll give you a great example. At Braidwood one morning, I show up and they say Mr. Roach, there's a two-inch piece of pipe that's a drain line that comes off the condensate header that's sprayed water on. Okay. Well, condensate is a totally non-tech spec system, usually, okay, hold on, okay, go ahead and deal with it. Well, they go, you know, by the way, you know, I'm reading the condition report that says this could result in an

800 gallon permitted leak in the main turbine building.

Well, wait a second, that's a different story now. Suddenly now we have an issue that needs to be observed. What are you guys doing about this? You know, how is the plant responding? Is this going to be an immediate corrective action type thing? An emergent repair? And then we get involved in that process under that PIR aspect. And because I have this database of documents that I'm looking at on the computer real time that wasn't available to the inspectors when this issue happened, it makes it much easier for me to flag items. And I think that's something that I have a benefit --

MR. BLEY: Bley. And is that, availability of that information across all the regions or is that something that's just been established here?

MR. ROACH: No, that's a licensee corrective, our licensee's corrective action programs are now computer databased and that's where the difference between what I could see real time as compared to --

MR. BLEY: Okay, so this might not be

true at other sites?

MR. SIEBER: It might not be.

MR. ROACH: It may not be. I can't say with certainty. I can say that Exelon and First Energy, the two sites that I've done most of my regulatory work at, that's how it works.

MS. BANERJEE: This is Maitri Banerjee. This biennial inspection that you mentioned under the HP radiation protection module, does that do any sampling of groundwater or in the area --

MR. ORTH: No, the baseline inspection that we do does not direct us to take any independent groundwater samples. We have the capability to do so, and in the case of Braidwood we did do a number of those independent measurements, taking samples and sending it off to our contract laboratory.

MS. BANERJEE: They used to sample the release points with --

MR. ORTH: Yes, in the pre-ROP program, we used to have our mobile laboratory and we used to take split samples of a number of media including the liquid release points.

MS. BANERJEE: But nothing now?

MR. ORTH: But not specifically now

under the ROP. That's not a part of the program.

MR. RYAN: Ryan, ACRS. Has there been any systematic look at, post the tritium issue, where else could an unplanned release show up? I think if you all walked kind of the whole site, is there any other place we need to look in?

MR. ORTH: Steve Orth. One of the areas we relied on was the industry's voluntary initiative. And as part of that initiative was to look across the site at vulnerable areas, piping, tanks, other areas that could potentially release unmonitored, unseen releases to the environment. And so, we're relying on that program, and our inspection program that I was talking about asked us to look as well to see that they're looking for these vulnerabilities.

MR. RYAN: But that's a voluntary program. There is no scope or no, in such a way that you're expecting them to do, it's whatever they decide to do, correct?

MR. ORTH: Well, they have provided us an outline for their volunteer program. But our inspection program asks our inspectors to look for those vulnerabilities as well and to see if they're looking.

MR. RYAN: And the second is the planned releases, is there ability to look downstream to see if there are any secondary pathways and to find out -- those kinds of things?

MR. ORTH: Steve Orth. In terms of the planned releases, we're relying and looking and reviewing on their environmental monitoring program to see if those are moving and dispersing, and moving into the environment the way that it's planned. But there is no other specific program in that area.

MR. SIEBER: What's the dilution factor if the Kankakee River should flood? Does anybody happen to know that?

MR. ROACH: I don't have that.

MR. ORTH: I don't have that particular number.

MR. SIEBER: It's not important enough -- I'm curious.

MR. ROACH: One thing, too, we have looked at particular surveys that the licensee has done when they re-initiated liquid releases. And we observed how the -- path when the river is basically maneuvered downstream, and so we know what the concentrations are at various points in the river

during a normal liquid release.

MR. SIEBER: Do they have an environmental program that looks at wells --

MR. ROACH: That's correct.

MR. SIEBER: Fish out of the river and all that kind of stuff.

MR. ROACH: They do fishing in the river and in the lake, the emergency cooling lake data basically, based on data for various fish species.

MR. ORTH: One of our findings, however, related to the tritium issue at Braidwood was that the environmental program in terms of the groundwater looked only near the ultimate release point, the discharge point.

MR. SIEBER: Right, instead of a long line.

MR. ORTH: Exactly. Exactly.

MR. ROACH: Are there any other questions on this particular slide?

MR. BANERJEE: I do have a question.

MR. ROACH: Sure.

MR. BANERJEE: Is there any way that you could have known except by actually looking at the vacuum breaker valve in an inspection procedure? This is all going underground, right?

MR. ROACH: Well, it spilled out off onto the --

MR. BANERJEE: You'd have to open the --

MR. ROACH: That's correct. Yes, sir. Just to give you a quick baseline, yesterday we did, some of the ACRS members and myself went out to vacuum breaker 1. That one had a relatively small size leak compared to the two major leaks. The 11 vacuum breakers at Braidwood, vacuum breaker 1 is the most accessible. That's onsite, it's in the controlled area, pretty easy to get to.

At the time of the spills, vacuum breakers basically 2 through 11 were effectively, without a rather extreme vehicle, were not accessible, say we're in the middle of a mud flood or a forest and whatnot. The licensee has dramatically increased the ability to access these vacuum breakers.

MR. BANERJEE: From a generic sense which -- how do you deal with this kind of --

MR. ORTH: Yes, in a generic sense, I think kind of going from those vacuum breakers, if there wasn't a significant leak or it was flowing over the ground and it was just, those were at that

point open to the ground. There was no bottom to the breakers. They're right into the ground. If you were opening the breakers at that time, you would have no means to know that it was occurring.

Now what we're looking for, as I said, you know, our new expectation or looking at that expectation is looking to see whether licensees have capabilities in place so that they can detect leakage from those vulnerable systems. Typically it's through groundwater monitoring program and that just didn't exist at the time.

MR. ROACH: They also have a leak monitoring system that provides a control room alarm which is obviously new.

MR. BLEY: This may be an unfair question to you two. You know, TMI and ACNW, when I worked at TMI a year or so ago and we had our tritium problems there and in other plants -- questions. What's the effort across the agency again in filtering all this information ultimately, all the strategy for how to deal with unexpected or unplanned radioactive material particularly tritium at all plants?

MR. ROACH: Steve is the greatest person to ask. He was a part of an agency-wide team that

went
around --

MR. ORTH: Steve Orth. What we did was once the Braidwood issue came up, at Indian Point we had a number of issues, the Executive Director for Operations commissioned a task force to try to look globally at what we knew of as the leaks that had occurred, the spills that had occurred, to look at our inspection program, our assessment program, look at the licensees program, the communications. And out of that, we developed 26 recommendations based on those lessons learned aimed at, as I mentioned, our inspection program was revised. We're revising certain regulatory guides to provide licensees additional guidance as to what we expect and how they should respond to those leaks. And just a number of those areas in terms of lessons learned, there's 26 of them, a number of them have been completed. I think a few are still ongoing.

MR. CORRADINI: Would it be helpful for us to get a copy of that? That report?

MR. ORTH: We'll get you a copy.

MS. BANERJEE: Like the ML number or something.

MR. ORTH: I'll get you the that ML

number for that report, yes.

MS. BANERJEE: Thank you.

MR. MAYNARD: Otto Maynard. Has this all been within the NRC's responsibility? Or is this concern may also be a violation of the NPDF -- have you had any discussions with other --

MR. ROACH: Yes, sir. For Braidwood particularly, they did receive violations from the state for release. In the State of Illinois, any groundwater above 20,000 pCi/L would be a violation not just breaking water. So, they had more restrictive regulation than the EPA did, so the state has issued violations and they are involved. The state performs, the Illinois Environmental Protection Agency in coordination with the Illinois Emergency Management Agency does a quarterly inspection now at all the six Illinois power plants regarding their liquid release process, et cetera.

MR. ORTH: Steve Orth. And additionally, we acknowledge their role in that and we had a member of the State of Illinois who is also on the Lessons Learned Task Force team.

SPEAKER: Can I go back to Mike's original question? I thought he had asked, okay, so now this occurred and you thought broadly where

would the other places effluent could go out and what might be the character of it so that, you know, you kind of get -- is this primarily liquid effluent? I guess my question kind of came off that you're concerned about liquid because gaseous effluents are always monitored as they're released and it's essentially stack releases. I'm trying to get a feeling for the character here. Are we talking primarily liquid effluents that kind of took people by surprise so to speak?

MR. ROACH: I would say primarily. Again, Steve, please back me up.

MR. ORTH: Yes, Steve Orth. I think our focus was on the liquid effluents but we recognized, too, that we couldn't just put that in a box and say that's the only possible place because with gaseous effluents, we need to make sure the licensees are aware of systems that could potentially be contaminated and have vents or releases from those as well. So, although I think our focus with Braidwood in any point was on the liquids, the information that we tried to put out and communicated to licensees is we can't just stop there, we need to look broadly.

MR. ROACH: One of the challenges that

we found that was a little bit inherent to Braidwood because of the tritium situation, Braidwood took about approximately one year where they did not do liquid releases which was obviously a major challenge for a pressurized water reactor plant. But they brought onsite these large tanks, several of them, 14 of them, that they filled up with 20,000 gallons of rad waste during this time period. They also started reprocessing water back to their primary water storage tanks. When that occurred, that dramatically changed the concentration in those tanks such that any leak from the primary water system now would introduce a major tritium onsite.

And unfortunately, as leaks would go, they had a leak in the primary water system in the turbine building, and that water eventually makes its way back to the cooling lake and they dramatically increased the value of tritium they sent back to the cooling lake, so it provided yet another path. So, unfortunately in the way things worked at Braidwood, impacts were being created just because of the original issue. That was a challenge. Unfortunately, the licensee went through trial by error and, you know, obviously --

MR. SIEBER: What did the concentration

in the lake amount to --

MR. ROACH: The highest concentration that they saw in the cooling lake was approximately 600 pCi/L which basically they had placed about 17 Curies in the lake last year and about 12 to 13 Curies in the lake the year before that. Their goal, administrative in nature, is 4 Curies in any one year in the lake and to maintain concentration below 200 pCi/L. They do have obviously increased sampling requirements, et cetera, once they go above 4 Curies, and then once they went above 200 pCi/L, then it was monthly samples that were read down as far as they could basically scientifically read the concentration in the sample.

MR. SIEBER: Thank you.

MR. ROACH: Okay. As I said, we are the eyes and the ears of the agency. A couple of pictures, two of the pictures here are from Braidwood. One of them unfortunately has to do with tritium again, and that's the one with the steam shooting out the side of the turbine building which is kind of a dramatic picture. That picture, basically one of the feed water heaters, low pressure feed water heaters relief valve fell open and it started sending steam out the side of the

turbine building which would normally be a maintenance hassle for them to deal with.

Unfortunately, the Braidwood secondary plant had about 40,000 pCi/L tritium in it. So, again, this was tritiated water. It was dramatic and that obviously steam leak of that magnitude is pretty loud, and Braidwood has neighbors unlike a lot of nuclear power plants and those neighbors were aware of the tritium issues. And so, they went to take a look at this. And that night, there happened to be a meeting with the public, so obviously things didn't go very well. But you can see just an example of the type of onsite immediate response in getting aware of what the situation was, how the licensee was dealing with it. This particular issue, there were a couple of guys working in the vicinity of this, so they had to be measured internally to see what kind of exposure they were getting because they might have breathed in some of the moisture and whatnot that contained tritium.

The other two pictures, one of them is myself in the cable spreading room at Braidwood. This is also unfortunately indirectly related to tritium. There was water in the cable spreading room which is an abnormal condition. You can see

the little Floor is Wet sign, and there's a nice big puddle of water.

What was happening was the licensee, in an attempt to try to minimize the amount of rad waste that was being generated by sources of clean things in the rad waste area, particularly ventilation systems and cooling systems that generate a lot of condensation that would not be radioactive in nature, those were being drained basically to the auxiliary building floor drain system which eventually wound up as an addition to the rad waste system. So, they had devised a methodology of getting that water sent back to the turbine building where it's still monitored but it's not a part of the rad waste direct stream. This is while they were obviously storing all the rad waste onsite.

Unfortunately, their pathway back through the cable spreading room clogged some drains that hadn't been used in many, many years. The cable spreading room, not a place you would expect to be draining water to, all those drains had sat idle for maybe 20 years and suddenly now they were taking water. They backed up and spilled water into the cable spreading room area.

This is one of those issues that we addressed with the plant management a couple of times and even invited their site vice president to come join me in the cable spreading room and whatnot. So, this was just an example of the eyes and ears of what we're doing out in the field when we identify issues and bring it to their attention. The issue above is actually from Arkansas Nuclear 1 and that's a fire and a diesel exhaust manifold just to give you some pictures from the site.

Rick Skokowski will address the Byron issue. Are there any other questions for the resident inspector? Thank you very much.

MR. SKOKOWSKI: I'm Rick Skokowski, S-k-o-k-o-w-s-k-i. I'm the branch chief for Byron, Braidwood and Prairie Island. Prior to that, I was a senior resident inspector at Byron. And before that, I spent time in Nine Mile and Indian Point, and also in the engineering side of the house doing -- inspections.

We're going to talk a little bit about the Byron essential service water pipe failure. This issue did end up in a white finding. And we initially found this issue through a review of the corrective actions documents. As Greg had

described, we look at the corrective action documents everyday. We look at them for several reasons.

One of the things that the residents are required to do is look for training issues. So, each site has their way of evaluating the condition reports but they will basically set aside and create stacks either on computer or physical stacks of condition reports that may be related to a trend. And a few months before this event occurred, the residents started to notice that there were condition reports on wall thinning or concerns with the nondestructive examination of the circ water, central service water risers at the Byron Station.

As they went on, they would do these examinations maybe once a quarter, once every two months. They noticed that there was one that the thickness was getting quite small. As a result of that, the inspector started to follow up on the licensee's activities and attended various meetings associated with the issue. One particular meeting was they said we need to go on and do some more examinations.

There were questions of, well, how far do we go? We don't know what a good acceptance

criteria, and all these sorts of responses rained questions from the resident inspector. And we continued to pursue this and asked questions about, well, is that the right thing to do, to stop doing the nondestructive examination because you don't know what you're going to do when you get your information? We pursued that, and of course the answer we received, well, that's not what we meant and that you ought to do more examination.

They had to put some of the examinations on hold because of the configuration of the system. These valves are in a non-accessible area with the missile shields in front of it and there were severe weather coming in. So, they didn't want to remove the missile shields to do these examinations with the severe weather coming in. So, that delayed the licensee's identification of the issue.

MR. ARMIJO: At this point, the system is still operable?

MR. SKOKOWSKI: The system is still operable. And Mel will go through some of the --

MR. HOLMBERG: Some of the details in the area.

MR. SKOKOWSKI: The details in the system's layout. But in general, as the residents

would go by, this is what they would see. They would see this big steel door. These risers were in an enclosure, so missile barrier enclosure. I have a better picture of what it looks like without that steel door there.

Unfortunately, they only open these, say maybe once every two months or so to go in and look at these areas. And it wasn't an area that the inspectors normally went into. So, if they would have gone in, they would have seen something that looked more like that, which would have created a lot of questions from many of our inspectors. However, you know, one of the difficulties we have is just by looking at that you can't tell how bad the condition is.

MR. ARMIJO: What are we looking at?

MR. SKOKOWSKI: This is the bottom of a pipe riser that was hidden behind that big steel door.

MR. HOLMBERG: I'll cover exactly where this location is to give you a feel for exactly what we're looking at.

MR. ARMIJO: Is that pipe buried --

MR. SKOKOWSKI: It's right through a piece of concrete. And it's basically in the floor

of the, going up to the force draft cooling tower for their central service, for their ultimate heat sink.

So, the fact that these risers were behind these missile barriers. It does create some issues with respect to inspection activities. Areas that are infrequently inspected are an item we have to keep our eyes and ears on. Normally, inspectors will make arrangements with the licensee to, whenever you open this particular place, let us know so we can go in there. In this particular case, the indication was just a piece of pipe inside that room didn't necessarily raise those questions that we should be making arrangements to go in there. And that's something we've improved upon to ensure we get into those spaces more frequently.

As we continued on, after they had gotten the information that the nondestructive examinations were showing smaller or thinner and thinner walls and the weather cleared and they went in to do more examinations, they did identify that it was getting thin. There were questions from the residents, and at this time we had coordinated with the specialist in DRS. As they were preparing the pipe to be better in the E, they created a hole in

one of the risers which at that point in time, through their technical department's manual, required them to either repair it or isolate it.

It's not a system that you could isolate easily in an immediate fashion. But they did create a lot of questions on our part, what is immediate? How soon can you shut down the plant? They did declare both drains of central service water inoperable and proceeded to do a dual unit shutdown.

The resident inspectors were there the entire time. We were questioning how they were interpreting their tech specs and their technical department's manual. We did observe the shutdown. We got in contact with our senior management as well as with the experts and discussed, you know, what this meant from a materials perspective.

Following that, I think by that Monday morning, this all occurred on a Friday afternoon of course, and by Monday morning we made the decision to have a special inspection team sent to the site. And with that, I'll turn it over to Mel.

MR. BLEY: Excuse me, Dennis Bley, ACRS. Your comment about asking questions, is there, in this evolution brings me to ask is there a point in time when operators are involved in an evolution

where they can say to you we're not talking to you until we get out of this situation?

MR. SKOKOWSKI: There could be. However --

MR. BLEY: Are you bound to do that if that should occur?

MR. SKOKOWSKI: We will not -- it's their job to operate the plant.

MR. BLEY: Yes.

MR. SKOKOWSKI: We're not going to interfere with them safely operating the plant. One thing that the inspectors are taking in consideration, if you can ask a question of someone else outside the control room, please do that. Again, as we did the tour yesterday, we didn't borrow the RO too much. And even the impact on the SRO or a senior reactor operator, we try not to do that if it's not a question tied directly to plant operations.

I have never had anyone say we're not going to answer your question. I have had people say, you know, give me a few minutes, where, you know, I've had senior reactor operators say that's not a question that's more appropriate for my control room. And we appreciate that. If it's

something we can ask elsewhere, we're going to do that.

MR. BLEY: Okay. Thank you very much.

MR. HOLMBERG: Okay. Good afternoon. My name is Mel Holmberg, that's M-e-l, last name, Holmberg, that's H-o-l-m-b-e-r-g. And I'm an inspector with the Division of Reactor Safety and I'm one of those "specialists" that he's talking about. And the reason I'm here today though is I was also the team lead for the Byron special inspection that was launched out back in October of 2007.

Today, what I'll talk about is some of the results of that special inspection. We'll be covering the finding associated with that corrosion event, some of the missed opportunities that the licensee had for heading off this condition, and touch on the evaluation of the finding in terms of the risk significance. And for that I'm going to turn that portion over to Laura Kozak to discuss the application of the significance determination process. Lastly, I'll talk about how we strengthened our inspection program as a result of this event.

But before we start that, because there

is some question here on configuration, exactly where are we talking about the service water system, I think I need technical -- the screen went dark.

This is just a simplified diagram actually of the Byron SX system. It's a little bit busy, so let me kind of walk you through it here. What you're looking at here is basically you've got several trains of service water, you've got a couple of trains of service water for each unit. This is a big dual unit site. You were at Braidwood the other day; if you were at Braidwood, you've seen Byron. These are clones. And the only place that's different is when you get into the service water system.

So, basically the area of interest is right along here. This is an eight-cell mechanical draft cooling tower. The area of interest is right here by these 163 valves. These are the, basically a discharge isolation valve before you take the final piece of the service water system into the distribution pattern.

So, kind of to recap, the way this works is your trains combine, they combine into a big 48-inch diameter header that runs underground. That 48-inch diameter header then splits into four

smaller headers, 24-inch diameter headers that basically enter what we call a vault at a point where they become aboveground pipes. And I've got some pictures here to kind of give you a better feel for that.

So, the area of interest, I know Rick kind of showed the picture, too, this is looking inside the doorway of that concrete wall. These just happen to be workers who were working around here for, this is the post event, some of the repair efforts. But basically, this is the riser. So, you've got a 24-inch diameter buried service water pipe coming vertically up through a concrete floor and running out the back wall which is constructed of sheet metal. So, this whole enclosure though is a concrete structure with sliding doors that come down in front here which would normally make this area inaccessible.

MR. CORRADINI: That's normally carbon steel pipe?

MR. HOLMBERG: That is carbon steel pipe up to this point. At this point, you've got a butterfly valve, and from the butterfly valve downstream is currently stainless steel. And I know that Rick already mentioned the condition of the

riser is the subject of this discussion here.

Okay. So, the as-found position of the risers was something that Rick mentioned here. Because of the configuration of the risers inside that vault, there was gaps both in the roof and around the doorway, and that sheet metal back wall was not water tight. So, the outfall from the draft cooling towers accumulates on the floor inside this vault structure. What we're looking at here under the as-found condition, this is an Alpha riser, basically this 24-inch diameter pipe right here, what you see are debris, and I'm going to pass around some of this debris. Maybe Laura can start that around.

Basically, I've determined it's shale-like, and since you'll be holding some of it you'll get a feel for it. But basically that's chunks of the pipe corrosion product that flaked off the perimeter of the pipe.

MR. CORRADINI: Is that the butterfly valve and the carbon steel system?

MR. HOLMBERG: It is, yes, absolutely. And that's the portion that was degraded and that's the portion that we focused on here. Again, this corrosion was extensive. It was what ultimately led

to the October 19th forced shutdown when they ended up with a leak. Specifically, this is a picture here showing us the leak, so back here. But basically, the leak was from a half-inch diameter hole that was again prompted by folks that were in there trying to get an NDE measurement on pipe wall thickness because they found it was all thinner than they thought.

But basically, each of the risers, going back to this picture, each of the risers had extensive external corrosion. Most of them had areas that were down below a tenth of an inch. Now, the original pipe wall was something on the order of three-eighths of an inch, 0.375, and at the point that the Charlie riser failed, when it was removed it was discovered that in fact there were four thru-wall holes in the Charlie riser and they were filled with corrosion products.

Now, the charley riser was not the only riser with thru-wall holes. In addition to the Charlie riser, we have the Bravo riser with a thru-wall hole. Okay, that is the Bravo riser. This is the as-found condition of the Bravo riser. They took it, removed it, sandblasted it, and there you've got a picture of the hole that was in the

Bravo riser.

So, the problem again was not confined to a single riser. And what the team did when we got onsite was establish a time line. How did they get into this condition? How did the pipes reach this material condition? As you might expect, corrosion like this occurs slowly. Our time line ultimately ended up being more than a decade in length.

What we did after constructing this time line was we found that clear back in the early 90's, they had an opportunity to actually prevent this corrosion. There was a task force that the licensee had commissioned to try to decide what to do with the condition of the distribution piping that was downstream to the 163 valves. This piping was originally carbon steel and it was corroding back in that time frame.

So, they had also decided that they were going to do something about this portion of the pipe and had issued work orders to clean and re-coat this section of the pipe. Unfortunately, those work orders were canceled because they believed that this portion would be replaced along with the distribution piping. The distributing piping was

replaced in '98 but this section of pipe was not. Nor was it coated or cleaned. And then --

MR. BANERJEE: Why was it corroding?

MR. HOLMBERG: It was corroding because this is the area inside that vault that's exposed continuously to water through rain, through outfall from the cooling tower.

MR. BANERJEE: It was corroded from the outside?

MR. HOLMBERG: From the outside in.

MR. CORRADINI: So, just so I'm clear, I want to go back to a picture, so between the 163 valve and where you replaced it with stainless steel, most of that was buried pipe line?

MR. HOLMBERG: It was all buried --

MR. CORRADINI: And this was all a matter of five inches of stuff that was sitting there that was getting all this crap?

MR. HOLMBERG: Correct. This is intended to give you some sort of sense of steel here. It's a very short stubby run of pipe that terminates with a pipe flange and it supports this valve. So, yes, it's only about five inches there, you know, the area that's in the continuous wetted environment that's contributing to the corrosion.

MR. BANERJEE: And there was no comparable corrosion in the buried pipe?

MR. HOLMBERG: The buried piping is coated. The buried piping is, you know, protected by several layers of, basically like a whole tar type of material and wrapped in -- protected from corrosion. They also do have a buried piping integrity program which I won't go into at this point.

But anyway, the opportunities to prevent was one area, but the other area that the team focused on was there was a complete void in the corrective action system. That's what the residents were talking about, from the early 90's all the way up until basically June or May of 2006. So, we tried to understand, well, what were they doing in that time frame? Why didn't they identify it?

So, we looked in several areas that involved maintenance and operations. For maintenance, probably the most routine activity that occurred frequently in this area, well, frequently isn't -- they would do VT2 inspections. These are the ones that are required by the ASME code to go in and look for leaks in the system. And that's required roughly once every three years.

So, they would have walked down the entire system including this section of pipe and their focus was looking for thru-wall leakage in that system. So, there would have been at least three inspections for each one of these eight risers, looking directly at that section of pipe by a protocol by an inspector. However, there was no condition reports generated.

Similarly, the valve, the butterfly valve, that valve was surveilled periodically so there were ops people and engineers in there performing those surveillances. And again, because it's sitting right above the valve -- opportunities to question what is this, what's causing it, what's happening, but that never happened. And so, what we ultimately determined was that they had too high of a threshold for when corrosion should be considered a condition -- to quality and entered in the corrective action program.

Ultimately though, they did, basically they got a new service water engineer, and evidently at some point it tripped his threshold because between May of 2006 through 2007, they ended up getting each of the service water risers captured in the corrective action program. However, the fact

that they were in the program and the fact that they did initiate corrective actions which was to clean and re-coat this section of pipe, those actions actually didn't take place. They had scheduled work windows that went on for several years to deal with this issue.

So, as a result, they ultimately ran this to failure, if you will, when the Charlie riser failed. And in fact, we considered this performance deficiency failure to take time for corrective actions, an example of a violation of Appendix B, Criterion 16. So, this was one of the regulatory issues we had with the state of things.

The second thing that I think we heard from Rick a little bit was about some of the measurements they did try to make. They actually had three risers where they had taken small areas of the pipe wall down to what they thought was metal and measured the thickness, and then did engineering evaluations because that thickness was below the code minimum wall. And in doing those calculations, they ultimately decided that they could live with this little stream 1/100th of an inch of pipe wall and still be acceptable for return to operation.

Now, when our team reviewed these

calculations, we found a number of problems. They had not maintained appropriately design margins. Specifically, they didn't valuate for the compressive loads that were present at that particular location. That would have contributed to buckling type failures. They did not use the applicable code allowable stresses.

They did not apply -- which account for some of the thermal loads. And they also failed to apply some of their design requirements for checking the functional capability of a pipe. So, ultimately, we determined that this failure to establish these adequate design margins in keeping these pipes in service was an example of a violation of Appendix B, Criterion 3 which is our design control regulation.

Now, both of these performance deficiencies are associated basically with the same degraded condition. They both contributed to extending the length of time that these pipes remain in service. They were both, therefore, assessed in a single finding and we'll hear from Laura here in a little bit about how we assessed the risk of the plant operating with these degraded risers.

Before I turn it over though, I do want

to mention that this event did prompt us to look at our inspection program and see what we can do to strengthen the inspection program. Specifically, we have submitted a change to the manual Chapter 2515, that's our overall light water inspection program procedure. Appendix D is the plant status procedure used by the resident inspectors.

And in that change request, we have focused the emphasis now to look in areas that are infrequently accessed that may contain risk significant components and look specifically for material condition issues such as what Byron found, corrosion, problems with vaulting, and take action if they find conditions such as that during their walk-downs. And that change has been accepted by the inspection program branch. We expect that procedure change to be issued by this fall.

Any questions on the material?

MR. RAY: Did they do a root cause evaluation?

MR. HOLMBERG: They didn't.

MR. RAY: And it was a lack of corrective action procedures report --

MR. HOLMBERG: Well, let me put it this way. There's a root cause, there's a physical root

cause which seems fairly intuitive and obvious. But the physical root cause is obviously external corrosion on an unprotected pipe. The programmatic pieces, they split up into, you know, failures in their corrective action program and some of their processes in dealing with operability evaluations. So, they tagged specific programs that they felt should have headed this off.

MR. RAY: You mentioned -- it seems to me like operability should have been planned for this.

MR. HOLMBERG: Yes, it is part of their tag list of programs that did not do what they expected it to do.

MR. ABDEL-KHALIK: Does this enclosure flood?

MR. HOLMBERG: It has drain holes at the corner of the enclosure. The floor is sloped slightly. Obviously it's a gentle slope and it's not enough to keep water from basically maintaining a wet condition against the pipe. But, no, they generally are not going to flood as long as the water going in is not greater than what the drains can handle. And they're roughly one-inch diameter type drains.

MR. ARMIJO: There was no chance that -- inside out --

MR. HOLMBERG: Yes, there was, you know, these pipes were sectioned. They were sent off to labs. This is the Charlie riser. This happened to be, not the hole that leaked but some of the corrosion product fell out when they physically cut the riser in half. And to answer your question directly, they ruled out ID type corrosion. They went and did a lot of testing on it to confirm that it was OD driven. It doesn't mean there wasn't corrosion on the ID, you know, this is a carbon steel pipe so there is a corrosion product later on with ID, but that is not the source of these holes and that is not the source of the major degradation they saw.

MS. BANERJEE: How big is the pipe? This is Maitri Banerjee.

MR. HOLMBERG: The pipe was 0.375, three-eighths of an inch.

MR. ORTH: Do you want to go into the crosscutting aspects a little bit?

MR. HOLMBERG: I could but I didn't, I'm worried about time here.

MR. ORTH: But just, we did look at and

there were several crosscutting aspects associated with the decision making that came out of this and are being evaluated with respect to the licensee's performance.

MR. MAYNARD: I take it that you took into account even their calculation --

MR. ORTH: Yes.

MR. MAYNARD: Is there any one thing in here you could, it's not good, but if we could add a bunch of things together, all the opportunities that even -- the calculations much closer --

MR. HOLMBERG: That is correct. One thing I do want to mention, you know, we did a lot more than just this with the special inspections. And of course, one of the key things is the -- condition review. And this is the main intake valve vaulting condition that was again in another vault. This is a sub-vault, a subsurface vault. But those vaults have been inspected by a VT2 inspector a month prior to this picture with absolutely no documentation in the corrective action system.

So, you know, as far as their threshold being in the wrong place and being a current issue, this put the icing on the cake. So, you know, they did have problems that affected other components

related to corrosion. So, anyway, I'll turn it over to Laura at this point unless you have any other questions?

MR. SIEBER: Thank you very much.

MS. KOZAK: Hi, my name is Laura Kozak, K-o-z-a-k. I'm one of three senior reactor analysts in the Region. And I was the one that worked with Mel in the team to look at the significance of the finding. And really what I'm going to talk about here is the difficulties that we had in applying our traditional SDP approaches and how we used what we call Appendix M to come to our final conclusion and how that's unique.

First off, how do I go back on the slides?

SPEAKER: Arrow up.

MS. KOZAK: Arrow up? So, first off, the dominant risk concern associated with this issue and this condition, it was really that pipe rupture that exceeds makeup capability because in that case it would result in the loss of essential service water which is very important at this plant. Leakage, they can be made up by the makeup system, it's not a risk concern. Nor was really losing one of the eight cells, essentially losing the cooling

fan, and that's because of the redundancy in the fans.

So, we had looked at sort of a spectrum of cases and discounted a couple of things. If this is what this finding represents, then it's not greater than very low safety significance which is we use to determine -- So, the dominant risk concern is something that is a rupture that results in the loss of essential service water.

What we said was, we made a judgment that the condition of the piping represented an increase pipe rupture frequency. And that is essentially saying yes to one of our SDP Phase 1 questions that says does your finding represent an increase in the initiating event frequency? In this case, the initiating event being a loss in essential service water. So, we said yes to that question which is a judgment.

MR. CORRADINI: So, can I, to understand that, that sounds significant but I don't think, so, this thing operates at some large pressure and was leaking.

MS. KOZAK: Yes. Yes.

MR. CORRADINI: And you have eight shared between the two units.

MS. KOZAK: Right.

MR. CORRADINI: And so, you asked the question which you said yes to. What were you answering?

MS. KOZAK: Does the finding represent an increase in the initiating event frequency?

MR. CORRADINI: Which is loss of essential service water.

MS. KOZAK: Right.

MR. CORRADINI: By a mechanism rupture, not a leakage.

MS. KOZAK: That's correct. And essentially, we were saying, okay, we know these pipes have been in this very severely degraded condition for a lengthy period of time. So, what would be the pipe rupture frequency of severely degraded pipes like this versus the pipe rupture frequency -- piping that is inspected and maintained?

So, intuitively, we felt like there was a difference but there is no real good way to estimate what that increase in the initiating event frequency is.

MR. MAYNARD: But at this point in the process, do you still have to quantify that as a

judgment as to whether there's an increase or not?

MS. KOZAK: In Phase 1 of the significance determination process, you don't quantify. It's just a judgment call: do you think this represents an increase in the initiating event frequency?

MR. CORRADINI: And the answer was yes.

MS. KOZAK: And the answer was yes.

MR. HOLMBERG: And I can help a little bit there. Mel Holmberg. The licensee did start performing calculations in support of this. And as I mentioned, the Charlie riser was down to an average of less than half the traditional wall thickness. And for some of the ones, they separated the correct loading so they didn't do operability violations, and applied the right factors. They were looking at using Appendix M limits, in other words, they were out of potentially the -- range to demonstrate operability.

So, the margins to failure were certainly reduced over what we would normally think the piping responding elastically because they were now having to rely on the -- to say that it would not fail. So, you know, when she says intuitively, there was some engineering behind it. It wasn't

just, you know, it looks bad so therefore it must be worse.

MS. KOZAK: Right. So, Phase 1, if you say yes to a Phase 1 question, that kicks you into Phase 2 of the significance determination process. We have Phase 2 guidance that says if you think the initiating event frequency has increased, then increase it by an order of magnitude or increase it by two orders of magnitude if the SRA thinks that it's appropriate to do. So, we did that. And if you increase the loss of essential service water initiating event frequency at Byron by an order of magnitude, it would end up like a red line.

But if you look at the basis for increasing the initiating event frequency, you'd find that it is not applicable for this type of condition. It really was for if you have redundant pump trains like if we were talking about findings related to the essential service water pumps and you had found that one of the pumps was unavailable for a year or something like that. So, the guidance for increasing the initiating event frequency was not appropriate for this case.

MR. ABDEL-KHALIK: What is the baseline frequency for pipe rupture on this system?

MS. KOZAK: Well, it would be very low. It would be on the order of E^{-8} per foot per year. Right. Nominally, it's negligible. Nominally, the rupture frequency of this small portion of the pipe are not contributing to the loss of essential service water. But our concern was that they were so degraded that now maybe they are or have or could be.

MR. ABDEL-KHALIK: So, when you increase the frequency by two orders of magnitude, then it becomes significant?

MS. KOZAK: Well, let me distinguish between two frequencies. First, what I was just talking about was the nominal pipe rupture frequency which is only one portion of the loss of essential service water frequency. So, the loss of essential service water frequency was on the order of E^{-4}, and that can include pipe ruptures, can include loss of all the pumps, can include everything.

MR. BROWN: That's what you thought by --

MS. KOZAK: That's right.

MR. BROWN: Got it. But you did not change your mind in terms of the pipe rupture increase?

MS. BROWN: No, we did think --

MR. BROWN: Saying yes, you went back and said no or --

MS. BROWN: We said we think that the pipe rupture frequency which wouldn't normally in this case contribute to the loss of essential service water frequency has increased and may contribute to the loss of essential service water frequency.

MR. BROWN: So, you didn't change your mind?

MS. KOZAK: We did not change our mind, no. We just changed our, we applied the rule --

MR. BROWN: But the order of magnitude, applying the rule --

MS. KOZAK: Almost blindly --

MR. BROWN: That was not appropriate --

MS. KOZAK: That's exactly right. It was not appropriate when you look at the bases for applying that rule. So, we said our Phase 2 result is not right.

So, what we do in SDP's phase, we have what's called Phase 3 in SDP which is anything that departs from Phase 2. And typically anything that is a greater than green finding gets a Phase 3

analysis. The problem with this finding and this condition is we don't even have any Phase 3 guidance to do this type of work. So, we really had no way to provide a good estimate of what that increased pipe rupture frequency was.

And what I put down here is no RASP manual guidance. RASP is the Risk Assessment Standardization Project. It's a manual for how we do our Phase 3 assessments, how ASP analyses are done. It was intended to coordinate the efforts across the agency in PRA and make some standardized process --

So, what do we do? Well, we have what's called the Planning SERP. And we proposed, the Region proposed the use of Appendix M, Chapter 0609, Appendix M.

MR. BLEY: Had you said, excuse me, what a SERP is?

MS. KOZAK: The SERP, significance and enforcement review panel, and the SERP panel consists of people from headquarters and the Region. And they decide on what the preliminary significance of the finding should be, and we would normally issue that to the licensee. The licensee can come in with information and then we would decide on the

final significance. Planning --

MR. BANERJEE: Is this like expert solicitation?

MS. KOZAK: I wouldn't say the Planning SERP is that, no. What happens is the regions performs risk analysis of the issue, I'm just talking in general, produces the document for review, it gets sent to headquarters for their review, for risk analysis and enforcement aspects. Then we have a meeting over the phone and there are three panel members, a couple of managers from NRR and one from the Region, and they agree to what significance to be assigned.

MR. CORRADINI: -- Corradini again. So, this all happened. And so now all of a sudden I see three parallel paths of activity now. One, the licensee is busy and we try to fix something that had preexisted for about 15 years. Two, you're trying to determine the risk significance of it to determine whether green goes to white or to yellow and oh my goodness. And now I assume there's another parallel path which exists of significance that there might be an enforcement action and a fine possibly.

MS. KOZAK: Yes.

MR. CORRADINI: Possibly. So, there are three paths. We're talking about the central path. Have we finished the first path and now we just, they finished it and life is good over there or are we going to get back to that?

MS. KOZAK: We were finished with it other than follow up to the corrective action program.

MR. CORRADINI: Okay.

MR. HOLMBERG: We can go through a supplemental inspection to follow up the rest of their corrective actions and then -- analysis.

MS. KOZAK: Right.

MR. SHACK: Just so -- William Shack, don't you compute the CCDP first? And then try to go back and sort of figure out whether, you know, and then that's the number that gets my attention.

MS. KOZAK: The CCDP here is that the loss of essential service water is set 1.0 and it's extremely high.

MR. SHACK: Yes, high.

MS. KOZAK: Which is what caught our attention to begin with, which is why we launched a special inspection because of the significance of the essential service water system, you know.

MR. STETKAR: I'm going to -- this is Stetkar, ACRS. I'm going to define dealing with this as really difficult, and I'm doing this not so much to, this is a good example for the type of question that I wanted to ask, so I don't want to focus so much on this example but it's to get the kind of understanding of the thought process about how the risk assessment is used in making your determinations.

MS. KOZAK: Okay.

MR. STETKAR: Everything you've said so far has focused solely on the loss of essential service water initiating event, period. I've heard you say nothing about the essential service water failures effort, any other initiating event in the plan for which essential service water is actually required. So, I'm not hearing you say that you've looked at the whole effect of failure of essential service water on risk. You only focused on only that particular initiating event as, granted that's an important initiating event. However, if essential service water fails, virtually all of the initiating events go to core damage.

So, it could conceivably have a much higher risk significance than even estimated only

looking at this particular initiating event or trying to evaluate the relative change in the pipe failure rate to the frequency of this initiating event. And I don't, I'm trying to understand how you factored in those other inputs from the risk assessment. In other words, the fact that for example, if you lost offsite power, essential service water stops and then once you restart which actually is a pressure pulse on the system which might blow that thing out.

MS. KOZAK: Right.

MR. STETKAR: And whether that type of thought process also entered into your risk determination process. Did it?

MS. KOZAK: It did and we considered that specific scenario at length. And in fact, we did those calculations and the risk of sort of the unavailability of the essential service water system was on par with or slightly less than the results that we were getting when we were --

MR. STETKAR: I just wanted to hear that you had factored that in, thanks.

MS. KOZAK: Yes.

SPEAKER: And the seismic, similar?

MS. KOZAK: We did. The licensee did

some work in the seismic area and we did some confirmatory work, bounding type analysis and said, yes, that could contribute as well. So, yes, we did factor that in.

So, anyway, planning SERP, getting back to what that is, a planning SERP is not something that you always have. It's when you have an issue and a finding that is difficult, you may need other resources within the agency, you don't know exactly how to go about resolving it. So, we went and we had a planning SERP and we proposed this use of Appendix M which is a relatively new process in the SDP. It's been around for a couple of years.

And it's the significance determination process using qualitative criteria. And it's intended to be used when we don't have the SDP tools or our results using our SDP tools are too uncertain to put the risk significance nicely into one of these categories. And you can't do it within 90 days because, you know, this is the inspection program and we need to resolve issues and not every finding can go through a research project to assign the risk to it.

So, we thought this was a perfect example of a case where we, it was very uncertain

and we didn't have the proper tools. So, we went to a SERP and we said we'd like to use this process that is essentially evaluating a lot of qualitative criteria with some quantitative insights and using judgment to assign the appropriate safety significance. In this case, our result was white which represents low to moderate safety significance.

MR. BROWN: Why was the frequency of rupture judgment, excuse, Brown, Charlie Brown, judged to be low when you've had, after the fact you see these three holes pop up and you just go in and try to do the work? Those are pretty big holes. That's a rupture.

MS. KOZAK: Right. That's right.

MR. BROWN: A rupture is big hole.

MS. KOZAK: Yes. Thousands of gallons per day.

MR. HOLMBERG: Okay, this is Mel Holmberg. One thing I want to make sure you have a feel for, we had, the licensee did a lot of work analytically. They actually produced finite element models, went back and modeled these things. And if they hadn't done that, you're right, we would have much less confidence in, you know, because that goes

in, factored directly into our decision making process because if they had not gone back and shown that in fact these things would not rupture if you had, in this case the thing that would potentially prompt a rupture is a thermal transient. Anything that could induce a large thermal load, because of the way these things are anchored, the pipe comes through a fixed point, goes up and hits another concrete section so it's fixed, any heat up causes bending moments which are going to be the predominant load in this area.

So, the point was they had done a lot of work to show that these things would not fail though they're going to be much less margin that they originally intended. So, that was, to answer your question, that's why we had confidence that it wasn't, you know, about to fall apart on routine operations I'll say.

MR. ARMIJO: So, the hole was not that it will blow stuff out but --

MR. HOLMBERG: They modeled the holes and --

MR. ARMIJO: But that loss still had no significance?

MR. HOLMBERG: No, yes, the loss from

that hole is not significant. Remember, this is the return header. This is the --

MR. BROWN: -- service water problem.

MR. HOLMBERG: Yes.

MR. BROWN: Somewhat.

MR. HOLMBERG: But a complete rupture would be a problem with this.

MR. BROWN: And it wouldn't split, that all of a sudden split in seam across the -- right around pipe.

MR. HOLMBERG: Right. Carbon steel is relatively --

MR. SIEBER: Did you make that estimate considering a seismic event?

MR. HOLMBERG: They did.

MR. SIEBER: And still --

MR. HOLMBERG: And those loads were in there, yes.

MR. ARMIJO: Armijo. Did the licensee dispute your finding of the white to green?

MS. KOZAK: They did not.

MR. ARMIJO: Okay. I didn't --

MR. HOLMBERG: But to answer on that, normally they would come in through a reg conference and present their side of the story. They didn't

want to do that either.

MR. ARMIJO: I'm sorry, come in through for a what?

MS. KOZAK: For a regulatory conference.

MR. ARMIJO: Oh, thanks.

MS. KOZAK: When we send out a finding, we call it a preliminary white, and we invite the licensee to either submit additional information or come in for a regulatory conference and discuss it with us. In this case, they said we'll take the white, we don't want to discuss this anymore.

MR. SIEBER: You resolve it in a regulatory conference with the regional director.

MS. KOZAK: That's right.

MR. SIEBER: So you don't do them unless you really think you've got the case --

MS. KOZAK: So, just to finish up with Appendix M which is the qualitative criteria, the types of things where the extent of degradation which you've seen was extensive, the fact that all eight risers in varying degrees, some of them quite a bit, exposure time, Mel said this mechanism has been going on for over ten years. There were opportunities to try to find and correct it. The potential plant safety impact which we talked about,

loss of essential service water, the conditional core damage probability is high, and this is from the licensee's PRA, 1.8E-2.

And that's because the loss of essential service water can result in a reactor coolant pump seal LOCA. And in this case, if you don't have essential service water, you don't have cooling to any of the makeup pumps. So, you can have very, you have no makeup capability. This CCDP represents a plant specific feature where they can hook up fire protection system cooling to the charging pumps and in that case avoid potentially a reactor coolant pump seal LOCA. And that's essentially the only mitigation to loss of essential service water.

MR. CORRADINI: So, just to get a handle on the numbers since I don't, so how do I, how can I get a relevant measure of that number? You said it's high, so what would one compare it to to know this is high? Because it's conditional on the rupture, right?

MS. KOZAK: Right.

MR. CORRADINI: So, what are some other numbers one would compare it to go, oh, this is really high?

MS. KOZAK: Well, our threshold for a

green to white finding is 1.8E-6.

MR. CORRADINI: For this CCDP?

MS. KOZAK: Well, Delta CDF, yes.

MR. SIEBER: In general.

MS. KOZAK: Right.

MR. CORRADINI: This is high?

MS. KOZAK: This is high.

MR. CORRADINI: Big time high.

MR. BANERJEE: So, what would -- suppose you add a loss of coolant --

MS. KOZAK: Well, yes, because you have redundancies of systems. You have multiple systems.

MR. BANERJEE: -- would have been --

SPEAKER: If you have no ESW for a LOCA --

MS. KOZAK: He said LOCA, that's correct.

SPEAKER: Oh, I'm sorry.

MS. KOZAK: I mean, if you have a LOCA, you've got RHR, you've got all these other systems.

MR. BANERJEE: Yes. I believe it's 10^{-3} or something?

SPEAKER: Or 4.

MS. KOZAK: Yes, 4. Yes, it's very high.

MR. STETKAR: Well, let's say it's

something that's really important and it kind of gets back to what I was asking before. This CCDP, that 1.8E-2, that number up there includes the licensee's credit for booking up fire water for cooling of the charging pumps.

MS. KOZAK: Right.

MR. STETKAR: And the question I was asking earlier was, for example, do they have a fire water cooling, does ESW cool their emergency diesels?

MS. KOZAK: Yes.

MR. STETKAR: Can they cool their emergency diesels with fire water?

MS. KOZAK: No.

MR. STETKAR: Okay. So, if I have a loss of offsite power and ESW stops intermittently, the diesels come on, the pumps restate, you get a pressure surge and the pipe breaks, I now have no ESW. I have no diesels. Now what is the implication?

MS. KOZAK: Right.

MR. STETKAR: And did you look at that?

MS. KOZAK: We did. Yes, we did.

MR. STETKAR: Okay. So, that was still bounded by the 1.8E-2?

MS. KOZAK: Yes.

MR. STETKAR: That's interesting. Okay, good. I hope you thought about that carefully because it sounds interesting.

MR. BLEY: That pressure surge they're not assuming would break the pipe.

MR. CORRADINI: No, they're assuming that something else was of a higher importance which was the thermal load --

MR. HOLMBERG: No, we looked at calcs that did both.

MS. KOZAK: Right.

MR. HOLMBERG: They did the pressure surges, too.

MR. SHACK: But then if you ever have to argue this particular thickness of the wall, you know, you have to get lucky to, you know, get thin this way, these calculations start to get a little --

MR. HOLMBERG: Yes. We actually, exactly what you're thinking. We looked at the certainty that they knew the configuration of degradation. And they actually put those uncertainties and actually did sensitivities. So, it was, they spent a lot of resources on this.

MR. ARMIJO: How good are these --

MR. SIEBER: -- knowledge of the geometry of the piping.

MR. ARMIJO: Can you really rely on them?

MR. HOLMBERG: I think I know where this is, yes, I'm not in a position to answer that. I really don't want to speculate. Go ahead.

MR. SIEBER: They've certainly done the hydraulics --

MR. ABDEL-KHALIK: -- your estimate is 10^{-2}. In retrospect, do you think that white finding was a bit generous?

MS. KOZAK: This is not, this number here is, you would have to combine that with whatever you think the frequency of a rupture of that pipe is so that, which is what the unknown here is. And as what we said, we don't have the tools or the ability to calculate that. So, the number, if we knew what it was, is not 1.8E-2, it's something less than that.

MR. MAYNARD: Also, this isn't the only consequence, the color of the finding isn't the only thing. You're looking at crosscutting issues and such, so white finding isn't the only consequence --

MR. HOLMBERG: Correct. Each of these had a crosscutting aspect.

MR. GILLESPIE: As I understand it with respect to your finding -- program, so the annual -- for how bad things were or how good things were.

MS. KOZAK: Yes.

MR. GILLESPIE: So, someone is going to be really following up on this in more and more detail to try to put, I guess a best guess number on that. That would be in -- program to try to put it in context with other --

MS. KOZAK: That is true.

MR. GILLESPIE: It's the 100th chance and this is an E^{-4} kind of event. That kind of hits that higher level that we only actually see one of those every four or five years.

MS. KOZAK: I would be surprised, I haven't heard what research is doing if they're doing more analysis of this. So, that is the process. I haven't heard that they're doing it. I would be surprised if they were trying to put an actual number to what the frequency of that was. If they try to do that, that's great because that can feedback into our SDP program and give us the tools and the ability to do that up front work. But --

MR. GILLESPIE: Okay. So, it's not that new interface --

MS. KOZAK: There is but they don't have the tools to do this either. So, I don't know, you know --

MR. GILLESPIE: They're research.

MS. KOZAK: Well, yes.

MR. GILLESPIE: They can do an expert --

MS. KOZAK: But they --

MR. SATORIUS: If I could just, this is a great example we think in the Region of being a metric prescribed by the Commission of having prompt resolution of issues, and prompt is defined as 90 days. And so, we went through a lot of gyrations here and I think at the end of the day, we come up with a reasonable approach to get the licensee to react and change the patterns that they had developed. So, we really look at this as a success story and my hat is off to the our risk -- it was risk informed decision.

MR. SIEBER: I agree, it was well done.

MR. ARMIJO: Armijo. I think it was fine job done. But if the licensee hires new VT inspectors --

MR. HOLMBERG: The report number 2007-

009. And there is some discussions in there where we found deficiencies in their training program. So, I don't know about firing anybody but I do know about strengthening their training program.

MR. ARMIJO: The training program -- always the answer.

MS. KOZAK: I'll be around if anybody has any other questions about SRA's. I heard a few earlier but I'll let Stu just give his presentation.

MR. SIEBER: Thank you and well done.

MR. SHELDON: I have something completely different. I'm Stuart Sheldon, S-t-u-a-r-t S-h-e-l-d-o-n. I'm a senior engineer in the Division of Reactor Safety here. I am also the Region III digital -- focal point for inspection activities that we have here. And I was a member on the special inspection for the Perry Scram due to digital feed water control system failure. So, I've been asked to give you about a five-minute overview of those topics all together.

So, I'll talk about -- it's all up to you. So, I'll talk about the Scram, what happened there, the controller 2 issues we have with Perry's reactor core isolation cooling system that caused them difficulty in reacting to the Scram, and then a

little summary of other experience within our Region with digital I&C systems.

This is an event in November of last year where Perry Scrammed due to loss of feed water. The additional feed water control system is a dual redundant Foxboro field bus system. The cause of the failure was a failure of two redundant power supplies in the system. It caused a level 8 signal to be sent to the reactor feed pumps that was not a real signal, it was just a sensed signal.

MR. SHACK: What's a level 8?

MR. SHELDON: Level 8 is high level in the reactor, so it tripped the reactor feed pumps.

It's a power supply failure. So, you take away power to any system, it's going to cause trouble. So, that in itself is not really a digital issue but there are a couple of aspects because it is a digital system that make it a little bit different. One interesting thing is the same component failed in both of these power supplies, and they failed in such a way that they could produce voltage as long as they run loaded but they cannot carry the load.

And the investigation that followed up came to a conclusion that one had failed earlier but

it was still --

MR. SIEBER: Not detected.

MR. SHELDON: Yes, we could not detect it because it had the lights on saying it had the proper voltage while the other power supplies carried the load. One of the other issues was that the operators were following essentially erroneous information. Let me go and show you how this is set up.

There are two control processors which provide the operator interface. Those are in the main control room. They have dual redundant power. They're connected by a field bus link, essentially an ethernet type link, to racks in the back of the control room where the I/O modules, input/output processors communicate with the field and send control signals to the field.

At the bottom right-hand, the two power supplies on the input/output modules are what failed. So, essentially it disconnected the control system from the field equipment. And this caused a little bit of confusion in the control room. This is the type of screen they saw. And what these tan fields show is that those numbers cannot be relied

on.

So, the operators had a system, a screen of buttons they would push and it would do things, but the numbers didn't mean anything. So, they tried for an amount of time to get the motor feed pump running. They got indication that it was dead headed. And sometime during this evolution, there was enough power in the I/O system to actually make some things happen out in the field and they got some, you know, the feed pump running and then it was unreliable and caused erratic --

MR. ABDEL-KHALIK: I'm sorry, but just to ask a clarification question. Does this connection between the controller and the field sensors essentially, does that mean that all the indicated values in the control room are just zeroed out?

MR. SHELDON: Mostly. Well, now, this is just on this display. All of their other --

MR. ABDEL-KHALIK: -- instrumentation.

MR. SHELDON: Right, they have all their other instrumentation on the control boards, but this is their feed water control system. It's non-safety so it's not their safety systems. But this is how they go about controlling their feed pumps.

So, that's one of the aspects that you get with this kind of a digital system is there are some different possibilities.

The recovery from the Scram was complicated by --

MR. BROWN: Before you get to the recovery, what was that crazy statement you made? This is the kind of thing that can happen with digital systems? This was not a digital system issue. It's a power supply to analog output module effectively more than that. I know what they look like but based on what the output modules have to do, they have to control real things that make the water heater increase, decrease, whatever it is to make the water go into the reactor.

MR. SHELDON: Sure.

MR. BROWN: Those are typically in control systems analog power devices, not microchips, not software, et cetera. So, when you take away the power, first, I perfectly understand what you're talking about, but I'm a little bit worried about the connection of a digital problem to the failure --

MR. SHELDON: What I'm trying to say is

that it's a complex system --

MR. BROWN: Oh, yes, yes, yes. But I would draw a line, there's a wall between the analog part which was the failure --

MR. SHELDON: Correct.

MR. BROWN: And the digital part which was doing the signal processing of what was going on some place else and telling the output module what to do. I'm very sensitive to this since it's what I did for 35 years, okay. And people always, just because it has digital on the control box, the final output of almost all feedback control systems, and I'd be surprised if this was an exception, is an analog power set of devices. You've got the power supplies to those separate power devices tied together, those auxiliary power supplies, that's what it looks like on your diagram.

MR. SHELDON: Yes, that's correct.

MR. BROWN: Okay, which is another problem, by the way. You should never do that. You should have had two independent sets of paired power supplies that did not bounce off each other. I've had one experience with those already where we almost oversped a steam turbine to 149 percent overspeed just because of this same type of

situation. One power supply had control but it kept noticing the frequency varying and so the -- they pulled the wrong power supply in terms of the trouble. As you left the bad one in there, the noise got in, so the control system part of it, the computation part, it disabled the overspeed trip and told the machine to speed up at the same time. That's what the noise did.

People think this stuff doesn't happen. That's an analog system that did this. So, if you want independence, there's only one way to get independence. And that's to separate everything total. You can't tell the piece, I don't know what -- I'm just very sensitive about this. And because I don't want people think, this was not a software system problem. This is strictly old time analog redundant power supply issue.

MR. SHELDON: Thank you.

MR. BROWN: Anyway, the implication --

MR. SIEBER: Yes, that's plain.

MR. SATORIUS: Message received.

MR. BROWN: Thank you very much. And a bad design on top of that. They should have never done it this way.

MR. SIEBER: Thank you.

MR. SHELDON: The recovery was complicated because the reactor core isolation cooling system initiated the trips and they could not get it to operate in automatic mode the closed loop control. The cause of this is that the analog controller --

MR. BROWN: Can I go backwards one more time? I'm sorry. Maybe these inspectors read all redundant power supplies -- should have some type of a periodic check which pulls one of them out -- load that the other one actually picks up. You don't want to do it when you're running -- that's not a good idea. But you've got to verify, otherwise just like you said, nobody knew this because of the nature of the lights that were on and all that other kind of stuff. So, anyway, just throw that back in in terms of your, since you're going back and looked at it, is it really tested in that manner periodically. If it's not, then you would never find this type of stuff.

And that's not an untestable type of situation. It's not untestable. It is testable to people who think about it. Other than that, I'm sorry. No, I'm not sorry.

MR. SIEBER: Go ahead.

MR. SHELDON: This was an analog controller that had been in tuned in 2006 by -- technician with what we considered inadequate guidance. And it was set up so that the system was essentially on the hairy edge of stability. When it was in the test mode, the systems tested starting from the condensate storage tank back to the condensate storage tank. So, when it came time to eject into the vessel, that's a different set of dynamics involved and that put it over the edge of stability. It was unstable in that situation and tripped on low suction pressure. They got very quick oscillations in the trip.

MR. SIEBER: Which were the settings on the controller was the cause of the instability?

MR. SHELDON: Did you say which of the setting?

MR. SIEBER: Yes, which was the setting?

MR. SHELDON: They have a very high rate setting.

MR. SIEBER: Okay, thank you.

MR. SHELDON: It's a high derivative. And since they passed its periodic testing from the condensate storage tank and that did not trigger this during the surveillance testing --

MR. BROWN: But they were testing it against its own -- I mean, from one pump, from its tank back to its own tank?

MR. SHELDON: Yes --

MR. STETKAR: But it's a relatively low --

MR. BROWN: No, it's not. You can't test it --

MR. SHELDON: The pressure is controlled by the discharge valve. It didn't raise the pressures. It's not just stable -- But it's very similar to an event that happened at Limerick in April of last year, a very similar cause -- control. Any more questions on that?

I do want to let you know about a few of the other things that have gone here at Region III. One in particular was this LaSalle site area emergency in February of 2006 where LaSalle had indication, they had a trip and had indication that three control rods had misleading indications on the location of three control rods. They could not tell that they had all -- limited emergency action levels, they declared a site area emergency.

This was due to the software design for their rod worth minimizer which is what they use to

verify the location of the control rods. They had done some verifications through the software and it was essentially a poor design -- farther than the last read switch so that there was no indication where they are. But we knew to reset the system, it resets the indication zero and freezes that. And then when they went through the procedures and that's why they reset the Scram, it would essentially go back live and they would get no indications. So, they were going from zero to no indication and -- So, that was essentially the bad design.

We've also had, most plants if not all plants install digital feed water controls here and we have reviewed some of those modifications. There are a handful of findings that have revealed themselves essentially through the trips at the plants when dealing with replacement of the CPU online and when the new CPU, the condensate feed water system reinitialized and closed all the -- in the condensate system. One of the design requirements is that the system be able to handle the power failure but they had not anticipated this requirement specification that they need a replacement CPU.

Exelon's digital electrohydraulic control -- most recently I was out at LaSalle to look at their system. The digital EHC system that they're putting in is a triple redundant system. It's got the field I/O connected by ethernet to the control room processors connected by ethernet to the plant process computer which ultimately was connected to the internet which is I think a bit interesting. But it's a non-safety system.

They did have some issues with tuning of their EHC system. The mathematical model that was used to develop it did not have the proper length of steam pipe. And so, they had a little bit of oscillation when they had to reduce power.

MR. BROWN: -- turbine control?

MR. SHELDON: At Braidwood, that's a turbine control system --

MR. BROWN: And they put it on the internet

MR. SHELDON: Well, it's connected through the firewall. That's one thing I find really amazing. We had backgrounds in digital flight control and the one thing that was burned in my head is separation. You don't put your critical systems, you don't connect it to --

MR. SIEBER: I consider that a key element and should be part of the cyber-security rules that the agency is putting on because there's been quite a few incidents just like that. Technicians like to be able to -- to repair some malfunctions. Once you do that, your system --

MR. SHELDON: In this case, they do go through firewalls, password protection. Those systems downstream are not supposed to be able to change anything inside.

MR. BROWN: But this actually goes out on the internet before it goes back to its control function?

MR. SHELDON: No. No, no.

MR. BROWN: -- status information.

MR. SHELDON: That's the idea. The last thing is talking about safety related upgrades. We don't see much from the safety related arena. These are all non-safety systems. Though we have had a couple of digital upgrades for radiation monitors, individual issuance, things like that that were evaluated under 10-50.59. We had to look at those through our 50.59 procedure.

MR. STETKAR: Let me ask a question now. Stetkar. We are careful to say, you know, the first

three are clearly non-safety related systems.

MR. SHELDON: Right.

MR. STETKAR: But they're pretty, from an operational perspective, they are pretty doggone important systems. So, for example, the design, the testing, any software related to those systems, redundancies, you said triple redundancies, so they satisfy although they're not safety related a lot of the same criteria that I might want to think about for safety related into the systems.

The question, and we've had it in other meetings for the Digital I&C Subcommittee, and that is how is this experience being fed back from the regions on non-safety related digital I&C failures back into the groups that are now very, very concerned about how to evaluate failure modes? What can happen to safety related digital systems? Because our feedback has been, well, there's no experience with safety related systems and you can't rely on information from non-safety related systems and we don't have any information about those failures. But obviously here in Region III you have actual experience. I'm assuming that the other regions do primarily from non-safety related systems, but valid experience.

And I guess I'm asking how is that experience being channeled back into the groups that are indeed tasked with the evaluation of the safety related digital I&C topics? Is there some formal process for doing this?

MR. SHELDON: There is. When the -- reports for findings that we have. We have about a handful, six or seven findings in this region and there are findings in other regions. Every year or so, there's this technical review group that goes through and reviews those sorts of, based on operating experience -- the findings of things and looks at it. And those reviews are done in my group by people with I&C experience or digital experience. They identify trends, issues, issues for resolution, generic issues that may warrant the information there is something going on.

MR. BLEY: Can I follow that up with a question? Bley. My understanding is you wouldn't get an LER unless you got a reactor Scram or took out -- safety system. Is that true? Or could you get an LER without that happening?

MR. SIEBER: You wouldn't get an LER unless it involved your technical specification or some safety --

MR. BLEY: The violation of the tech spec, the Scram or taking out both -- in the safety system, but I could be wrong.

MR. SIEBER: If the drinking water fountain failed, you wouldn't send in an LER.

MR. SHELDON: Most of the feed water problems result in a Scram and that's --

MR. BLEY: You get a Scram, it will be in there.

MR. SIEBER: That's an LER.

MR. SATORIUS: Mark Satorius. Another place that information is fed back -- real time since NRR has a very aggressive operating experience organization which they've put in place within the last couple of years. Those folks are on every region's morning call and they issue a document everyday electronically that I'm on distribution for on many of the SAR. And you will see these types of issues that are tagged. And they're tagged for follow up and they're followed. So, they get this digital I&C type of issues that are non-safety but important to safety.

So, these are in fact documented, identified and followed up on. So, I think that, I lost track, that might have been your question.

MR. STETKAR: What's the channel that the information, is there a formal channel that the information is being funneled from you guys as the eyes and ears?

MR. SATORIUS: That's the one I described is formal --

MR. STETKAR: In NRR?

MR. SATORIUS: Yes. That's what you're looking for, isn't it?

MR. STETKAR: I'm looking for --

MR. SATORIUS: Like getting back to a central clearinghouse for decisions which --

MR. STETKAR: At NRR.

MR. SATORIUS: Yes, it would.

MR. GILLESPIE: -- NRR is not NRO.

MR. SATORIUS: That's right. But I wanted to make sure --

MR. GILLESPIE: -- look at the criteria of the safety system with the new reactor together -- and the committee suggested that you need to figure out what your failure mechanisms are and quit focusing on probabilities on how likely is it going to fail. But you can maybe basically say worry about what the failure mechanisms are first and how they're going to fail. So, that was a research NRO

issue and how does the ops information from NRR get to the people doing safety systems in NRO. And John, these guys might not be --

MR. STETKAR: You're right, it's getting into -- a couple of different directions and it sounds like, from this end, it's being covered very well.

MR. SHELDON: -- opportunities for cross pollination with NRO. I've worked on some of the inspection procedures for the --

MR. SIEBER: We have 25 minutes until we have to leave to catch the airplane -- so maybe we can begin wrapping things up. We can cover some things in the schedule that we haven't but we'd like to finish promptly at 2:30.

MR. ORTH: My name is Steven Orth, last name is O-r-t-h. And I wanted to highlight some of the areas in our tritium issues. I know it's a lot but -- earlier so I'll try to keep it brief and nothing too redundant. I've placed on the table the Lessons Learned Task Force report with the ML number and I gave that to the reporter as well so you have that for the record.

A couple of things I'd like to highlight is earlier today our inspection of the issue when we

began to be notified of the elevated levels, we sent health physicists to the site. We conducted a more comprehensive inspection at the end of 2005 into 2006. One of the areas that we don't have a lot of expertise in this region is, or any region, is really groundwater hydrology. And that's where we went for a technical assistance request and we had hydrology support during this inspection and others of our groundwater contamination issues from the Office of Research as well as what we found here was we are, while we are health physicists and we -- operational health physics -- communicate health impacts and those risks, when it came down to the tritium and other brown earth contamination issues. So, again, we tapped our resources back in the program offices to get that level of expertise.

When we looked at the Braidwood issue and evaluated it, we ran it up with a finding that we processed through our reactor oversight program through the Public Radiation SDP. And that was not so much a leakage or the licensee's failure to respond to the leakage when it occurred historically back in '96, '98 and 2000, we processed that through our Public Radiation Safety SDP, and that came out as a white finding, characterized as a preliminary

white finding, and we did do quite a number of internal peer checks because this was really the first of its kind that went through that SDP. We had each of the regional offices involved, the headquarters program office involved, to make sure that we were processing this finding correctly and that we had peer checks on us to see if we were going through the process both -- and through the SDP.

Finally, I think Steve mentioned earlier our external outreach in communications. Those started off rather well from the beginning. Of course we had limited information and the public was very emotionally involved in this program. You know, we said it outright, the offsite dose from this was very minimal, 0.2 millirem. But this is material that was released basically into somebody's backyard that shouldn't have gotten there. It was meant to go out to the river to be controlled and monitored. And we really had to internalize that perspective when discussing this with members of the public, being as transparent as we could about what the issues were and what our outcomes were. I think that's where we gained the most success.

Just to mention a couple of additional

lessons learned and changes that we made, one of the items we had, I mentioned we changed our inspection procedure. Our inspection procedure and our SDP for that matter was based on routine effluent releases. We really didn't have an incoming focus on leaks, spills, inadvertent releases. Both of those documents are updated to reflect that.

And we are completing our revisions to our regulatory guides, 1.21 and 4.1, to also have that input into the licensees, the expectations and requirements, basically to show how they can meet the requirements for responding to these leaks. Because I think this is where we get into the difference between, as we mentioned earlier, what's a voluntary initiative and what's a regulatory requirement. And we've tried to communicate to the licensees and to the public, that once the leak is identified, you're outside of voluntary initiative, you're into regulatory requirements. You're into 10 CFR Part 20 in terms of doing the radiological assessment and the identification of the leak during your monitoring, assessing the offsite consequences and reporting those leaks. Reporting those leaks being a requirement to put into the annual report and the lessons learned task force going beyond that

says licensees should developer a closer relationship with their local state offsite official so that it's not a small paragraph in the annual report but something more meaningful and more communicative --

MR. RYAN: Question on that point. When I was with the ACNW, we heard this sort of staff report and the requirement is to report a spill -- if the work is okay, that's fine, you're all right. And the second is 100 millirem per year as best that I can recall. There is no requirement --

MR. ORTH: That's correct.

MR. RYAN: That's wrong -- learn that's the wrong criteria in our -- if you spill something inside a plant, you clean it up. If you spill it outside of it, why shouldn't you do the same?

MR. ORTH: Currently, our guidance or our NRR requirements are to assess the offsite impact and essentially the licensees at their discretion can either mitigate it, and then as in the case of Braidwood is withdrawing the rad activity from the environment, or in some cases, the licensees are just monitoring the releases as it moved offsite into the restricted areas.

MR. RYAN: -- it's reasonable to think

that -- because that is not something that degrades over in that case and then waits decommission. That's how you take a small amount of contaminated soil and turn it into --

MR. SIEBER: Actually, outside the plant boundaries, the state has the responsibility --

MR. RYAN: I'm not talking about outside --

MR. SIEBER: They may fine the licensee. They may require them to mitigate it. It's the state --

MR. RYAN: Yes, I'm not talking about outside the plant now. I'm talking about inside the plant. Just recording it on a log if nobody --

MR. ORTH: And in many cases, the plants do try remediate or mitigate it, but I understand your comment. I'll try to keep this abbreviated so I'll let Tom pick up if there aren't any questions.

MR. SIEBER: Thank you.

MR. KOZAK: My name is Tom Kozak, T-o-m K-o-z-a-k. This is our last subject, we wanted to briefly mention operating experience. That was one of the subjects that you had requested.

We have a pretty robust operating experience program here in Region III. As you know,

one of the recommendations out of the Davis-Besse Lessons Learned Task Force was that we had to really look at our operating experience program agency and really start using that to inform inspectors of current issues and things to be looking at, which we have done. Basically, NRR has the lead for our operating experience program here in NRC. We have a group, an operating experience group, and they screen issues everyday, brief management everyday in the morning on issues that have come up each day.

Each region in turn has an operating experience to contact or two. In Region III, I'm the primary contact or I'm responsible for operating experience in the technical support group in our Division of Reactor Projects. Monte Philips who is sitting over on the side over there, he's the person who is of Ask Monte fame of our knowledge transfer/knowledge management program and we're going to have a space in the corner where you can click on it and he's going to answer all your questions.

Anyway, we're the contacts for operating experience here in Region III. And what we do is each day, well, we're on distribution for essentially anything that comes out of the operating

experience group and headquarters. And what you see on the board here listed are the various operating experience issues that are handled by NRR.

We have what's called the OpE COMMs or operating experience communications. We get about anywhere from two to ten of these a week where they're communicating things that have happened across the nation and even abroad, issues that may have occurred. We get those, Monte and I, Monte primarily, in our own region --

We have distribution groups for these communications. And what we do is we send them out to whom we think these issues will affect and they should go ahead and go follow up with those at their sites. For instance, if there is something to do with steam generators, we'll send them to all PWR resident inspectors, and we'll send it to the ISI inspectors, for instance, in the region. We send it directly to them.

We don't want all of the operating experience communications to go out to everybody because quite frankly then you'd be overloaded and you'd stop looking at them. So, we try to figure out, it's our responsibility to figure out who should hear first-hand about the operating

experience issues and we send it to them.

There is also operating experience briefings. That's where NRR takes a lead and briefs our senior managers on significant issues. The last one was transformers. They do that about quarterly. I'm sure you're aware of those.

Stu mentioned operating experience issues for resolution. Sometimes when there is something that's sufficiently complicated that they need to do additional work and identify if there should be generic communications or inspection, special inspections to be done on them, NRR will do that with whatever issues come up.

Stu also mentioned technical review group outcomes. There's approximately 20, not exactly 20, technical review groups for different types of issues, auxiliary feed wire, digital IFC, just to name a few, MOB's. And NRR has a lead for those technical review groups and there are experts on each one of those technical review groups.

And every two years I believe it is, is that correct, two years? They sit down as a group and go over any issues that came up in that area and determine if they should input that into our baseline inspection program, something to look at an

issue in an area, any type of generic communications, information analysis, what have you. That's what the technical review groups do. So, they're constantly informing the inspection program based on issues that have occurred in their area of expertise.

And in our region, we've taken the initiative every Thursday after our morning daily events briefing, Monte will go over every one of the operating experience communications, procedure changes, any type of issues that have happened abroad, just so people have heard them once. They're not getting them in their in-box everyday but we'll go over them every Thursday morning so that people are aware of what's out there. And then we post it on the website to make sure that people have access to that if they wanted.

The smart sample process, that was another thing that get asked about. Smart samples are simply an additional tool that we have, that we make part of our baseline inspection program. NRR will come up with some generic issue that may be of interest to a plant, and they will say here is what's called a smart sample, one sample that will feed on that's part of our baseline inspection

program that an inspector should do in case, when they're doing a baseline inspection program if it's applicable at their site.

There is no requirement to do a smart sample. However, in Region III, our expectation is and we've communicated this to our inspectors that if the sample is applicable to your site, you will do that smart sample as part of a baseline inspection program. It doesn't require any additional hours as part of the already budgeted baseline inspection program and we expect the inspectors to go ahead and do those smart samples. There has only been five issued so far. We document those, any results for those in our inspection reports. And so, that's essentially what the smart sample process is.

That's it for my prepared -- well, but I wanted to show you very quickly, this is our internal web page. And you can get to this, I know Mr. Shack asked earlier how to navigate on our web page, you can go to our internal NRC web page. Go to Region III and you can get to this web page here which is a Region III page that we maintain in technical support. And we wanted it to be basically a one-stop shopping for inspectors where they could

go for just about anything.

And on this, you can see in the top left toward the middle, we have a story about an unusual event at Byron. We try to update that as events happen. On the left, we have some guidance or reports, things like that. But as you go down, you'll see we have a whole section here on the left-hand side of operating experience.

And this is where we can go to ask for information, the operating experience information gateway which is the NRR's operating experience page. We have all of our postings there. So, inspectors know, and we brief on this every six months at our inspector seminars, where they can go find the operating experience. So, it's readily available to our inspectors. It's right on the web page that we've designed for inspectors.

And that's about all I have to say about operating experience. Does anybody have any questions on that? Okay. I think that that wraps up our presentations. I don't know, Jim, if you'd like to say something?

MR. SIEBER: Thank you very much.

MR. CALDWELL: John, did you have to do anything to close?

MR. SIEBER: No.

MR. CALDWELL: Well, I see, did they give the pictures?

SPEAKER: Yes, I'm going to distribute them. Thank you.

MR. CALDWELL: I appreciate you all coming out. And I'm glad you had the tour to one of our sites. The -- are very good questions so it causes us to think. So, I appreciate the questions that you had. I hope that we had the answers to you and then there were a couple we were looking at that we said we'll soon have for you.

SPEAKER: We do have some independent spent fuel storage information if you'd like to talk to Sarah afterwards. She is prepared to answer some of the additional questions that you had.

MR. CALDWELL: But I hope you got the sense, and this is, I've been in this Region like I said about 13 years. I'm very pleased to be part of the Region III organization. We have really good folks here. They are dedicated and focused on the job and the mission. And I hope you got that sense today from the people that talked to you. If you get around to meet more of the folks, you get more of that sense because it is a good place.

So, we appreciate you coming out here. We hope you walk away with that message that there's good people out here and they care about what they're doing. So, I hope you have a good trip back. And obviously if you have any other questions, you can get a hold of us and we'll get you some answers. Thank you very much.

MR. SIEBER: I'd like to say on behalf of the ACRS that I think that our trip out here and particularly to the Regional Headquarters has been an excellent source of information for us and gives us an understanding of actually what goes on out in the field and how the regulations and the work that NRR and NRO do and how it interfaces with licensees. And obviously this is where the rubber hits the road. And so, the licensees are going to be safe and productive and the most influence through NRC has on comes from the region. And we understand that and appreciate that.

So, we appreciate you, all the work you did to prepare for today's meeting, and all the participants from your staff. I've learned a lot even though I've been here a bunch of times, and I'm sure everyone else has, too. So, on behalf of the ACRS, thank you very much.

MR. CALDWELL: Thank you. Also, I would like to thank Tom and I don't know if Gail is in here or not, and then the rest of the staff for their presentation. Maybe we can give them a big hand.

(Applause.)

MR. CALDWELL: All right. Thank you all.

MR. SIEBER: Okay. Thank you.

(Whereupon the meeting was adjourned at 2:25 p.m.)

CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Advisory Committee on Reactor Safeguards

Docket Number: n/a

Location: Lisle, Illinois

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Stuart Karoubas
Official Reporter
Neal R. Gross & Co., Inc.

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ACRS Visit To Region III – July 24, 2008

- James Caldwell – Regional Administrator

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Time	Topics	Time Allotted
8:30 – 8:45	Opening Remarks – J. Caldwell, RA & J. Sieber, ACRS	15 minutes
8:45 – 9:30	Region III Mission, Vision, Organization & Knowledge Management – M. Satorius, DRA	45 minutes
9:30 – 9:45	Break & Group Photo	15 minutes
9:45 – 10: 45	Plant Performance in Region III – C. Pederson, DRP and S. West, DRS • Reactor Oversight Process • Plant Performance Summary • Event Response • Reactor Program Initiatives • Reactor Program Challenges	60 minutes
10:45 – 11:00	Independent Spent Fuel Storage Installations – S. Bakhsh, DNMS	15 minutes
11:00 – 11:15	Break	15 minutes
11:15 – 11:30	Incident Response Center Tour – S. Orth, DRS & D. Smith, DRS	15 minutes
11:30 – 12:15	Lunch	45 minutes
12:15 – 1:45	Reactor Oversight Process Roundtable • Resident Inspector Program – G. Roach, SRI LaSalle • Byron ESW & Use of SDP – R. Skokowski, DRP; M. Holmberg, DRS & L. Kozak, DRS/SRA • Digital I&C and Perry SCRAM – S. Sheldon, DRS •Tritium – S. Orth, DRS •Operating Experience Use in RIII – T. Kozak, DRP	90 minutes
1:45 – 2:00	Wrap-Up, Including questions and Closing Remarks – J. Caldwell, RA & J. Sieber, ACRS	15 minutes

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Region III Mission and Vision

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Region III Organization and Knowledge Management

Mark Satorius

Deputy Regional Administrator

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Region 3

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Region III Organization

REGIONAL ADMINISTRATOR
J. Caldwell
M. Satorius, Deputy

DIVISION OF REACTOR PROJECTS
C. Pederson, Director
G. Shear, Deputy

DIVISION OF REACTOR SAFETY
S. West, Director
A. Boland, Deputy

DIVISION OF NUCLEAR MATERIAL SAFETY
S. Reynolds, Director
J. Madera, Acting Deputy

DIVISION OF RESOURCE MANAGEMENT AND ADMINISTRATION
B. J. Holt, Director
K. Sotiropolous, Deputy

STATE LIASON OFFICER
REGIONAL COUNSEL
ENFORCEMENT & INVESTIGATIONS STAFF

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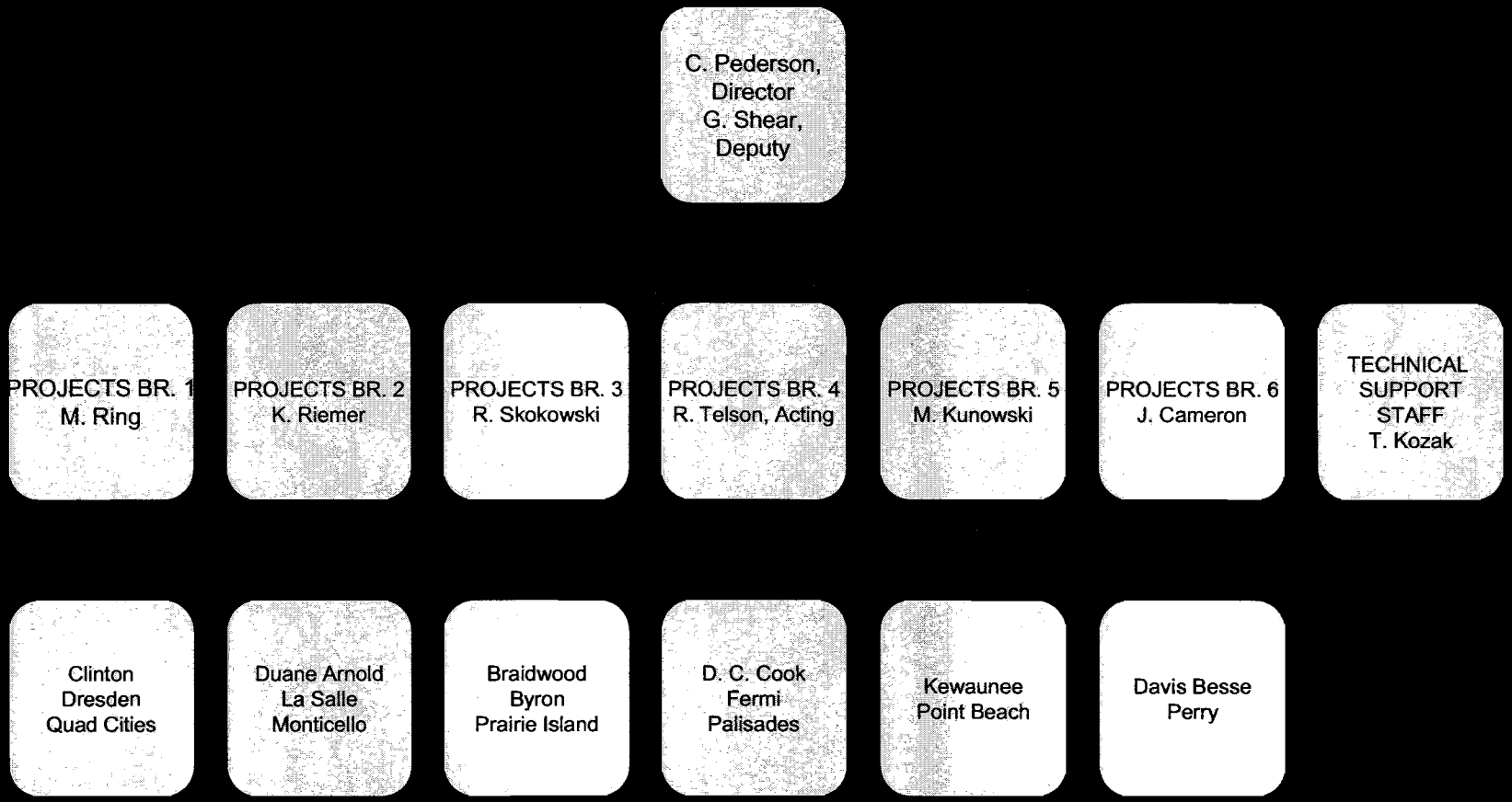
Division of Reactor Projects



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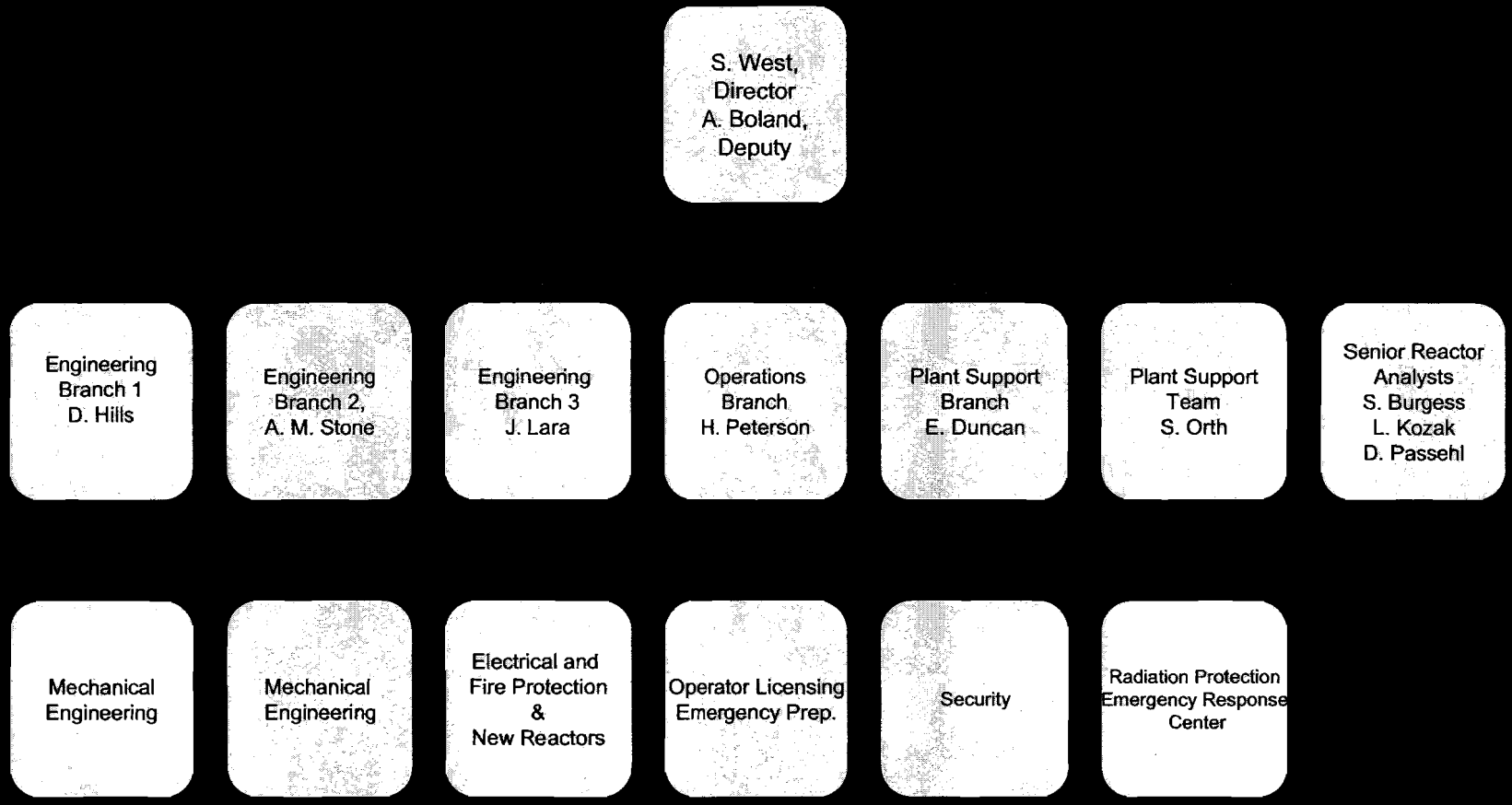
Division of Reactor Safety



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Division of Nuclear Material Safety

S. Reynolds,
Director
J. Madera,
Acting Deputy

Materials
Licensing Branch
P. Pelke

Materials
Inspection Branch,
P. Louden

Decommissioning
Branch
C. Lipa

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Division of Resource Management and Administration

B. J. Holt,
Director
K. Sotiropoulos,
Deputy

Information Resource
Branch
J. Foltz

Human Resources Team,
M. Rubic

Financial Resources
Branch
M. Kerlin

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Knowledge Management/Transfer

- Some infrastructure already in-place
  - NRC Inspector Field Observation Best Practices
  - Engineering Inspector Handbook (Pending)
- Significant material available through various agency processes:
  - IMC 1245/1246 qualification program
  - Agency OPE web page
  - Region III OPE web page
  - Real time training (post 8:15 topical discussions)
- KM Steering Committee

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Region III KM Focus

- Re-structure bi-weekly KM transfer/training for NSPDP, new hires, and other interested staff
- Develop a Region III KM Web Site
- Develop a mechanism to capture training presentations (video/web-cast/slides)
- Capture additional in-house unscheduled training (division/branch level)

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Bi-weekly KM Transfer/Training

NUCLEAR REGULATORY COMMISSION REGION III Presents.....

Knowledge Transfer

Great Opportunities! Knowledge Sharing! Stories and more....

Rolling 20-Week Topics

When	Time	Topic	Facilitator
June 16	1:00	10 CFR 50 Overview	Kunowski
June 23	1:00	Design Control	Lara
July 9	1:00	States Agreement Program	Lynch
July 15	9:30	Ethics/ORA Topics	Heck
July 24	10:00	PRA/Risk Topics	Burgess
July 29	10:00	10 CFR 50.109 Backfit	Stone
August 5	10:00	Materials/Licensing Program	Pelke
August 12	10:00	Differing Professional View	Ring
August 19	10:00	10 CFR 50, Appendix A/B	Dahlbur

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Region III KM Presentation Capture

- Podcast training sessions and other activities in region (e.g. 8:15 A.M. meeting presentations, KM training sessions, etc.) http://www.r3intra.nrc.gov/knowledge_mgmt/Sessions/engineer-design-control/engineer-design-control.html

- Expand materials picture library to include reactor related activities (sites, inspectors in action, equipment, etc.)

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Region III KM Web Site

- Links all the KM pieces together
  - Routine training podcasts
  - 8:15 a.m. morning notes
  - Agency KM resources
  - Picture Library
  - Agency and regional OPE
  - Post 8:15 a.m. meeting podcasts

- "Ask Monte" KM web site search function

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Reactor Performance in Region III

Cindy Pederson – Director, DRP
Steve West – Director, DRS

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Reactor Oversight Process

Reactor Oversight Program Elements

Region III implements the NRC's reactor oversight program by utilizing the following program elements:

Baseline Inspections
- Minimum inspection level received by all facilities
- Conducted by resident and region-based inspectors

Supplemental Inspections
- Based on licensee performance
- Focused inspections of problems and issues
- Conducted by resident and/or region-based inspectors
- Prescribed by the Action Matrix

Temporary Instruction (TI) Inspections
- For generic safety issues; one time inspection

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Reactor Oversight Process (Cont)

Reactor Safety Program Elements (Cont):

Event Follow-Up Inspections
- Special Inspections
- Augmented Inspections
- Incident Investigation Inspections

Allegation Review and Follow-Up

Enforcement/Significance Determination Process

Plant Performance Assessment
- Performance Indicators
- Inspection Findings

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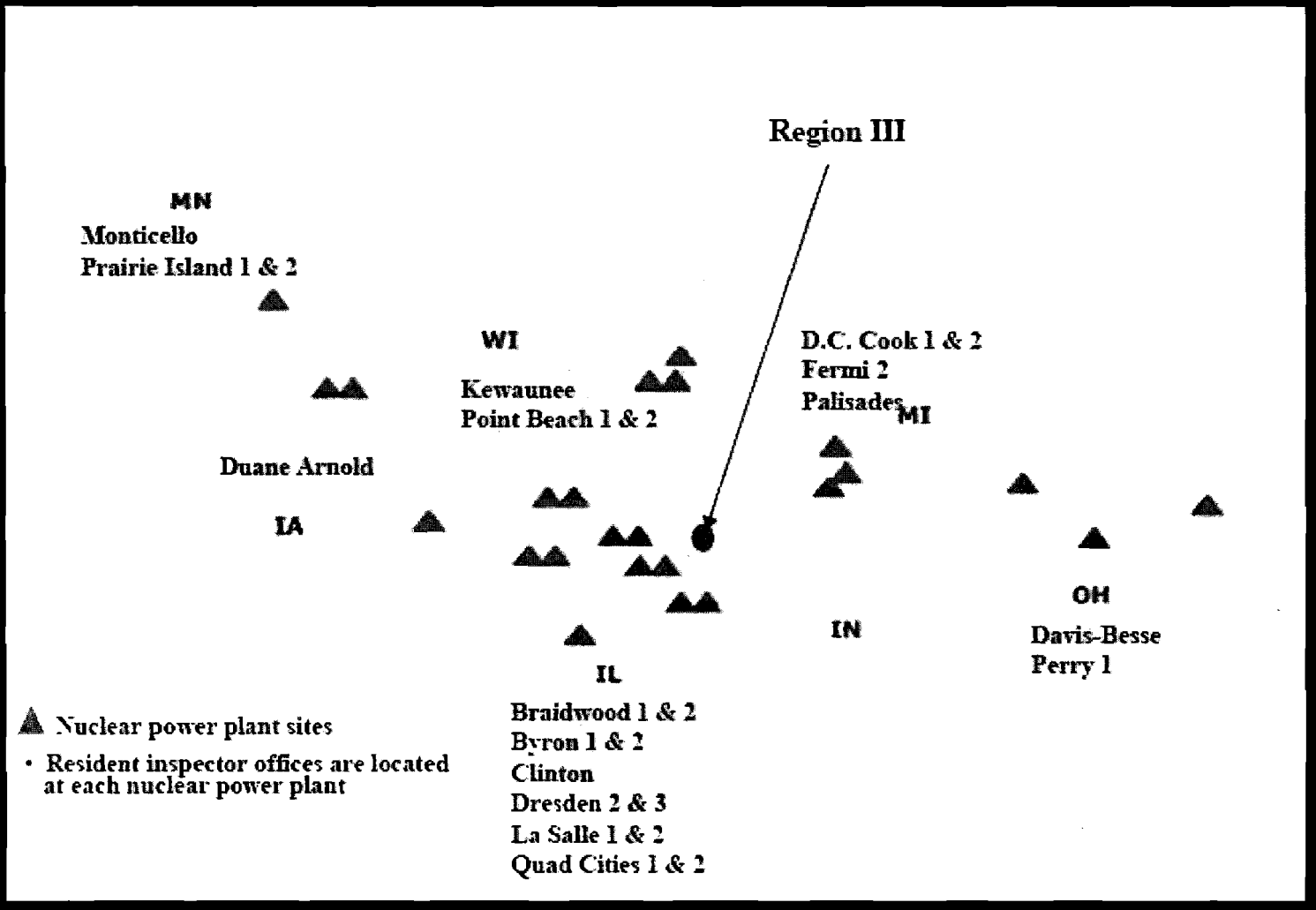
Reactor Safety

Where We Regulate



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Current Region III Action Matrix Results (through end of 1st Qtr 2008)

- All Facilities in Licensee Response Column of Action Matrix (Column I) except the following, which are in Column II (Regulatory Response):
  - Byron Unit 1 (ESW White Finding)
  - Byron Unit 2 (ESW White Finding)
  - Perry (White Scrams PI)

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Region III

Units in Respective Columns

	EOC 2006	MC 2007	EOC 2007
Column I	13	16	21
Column II	8	5	2
Column III	0	3	1
Column IV	3	0	0

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Comparison of Action Matrix Summaries as of 1st Qtr 2008

Region	Region I	Region II	Reg. III	Reg. IV
Col. I	100%	81%	87%	60%
Col. II	0%	13%	13%	20%
Col. III	0%	6%	0%	15%
Col. IV	0%	0%	0%	5%

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Sites With Current Cross-Cutting Issues

- Fermi – Human Performance – procedure inadequacies and failure to follow procedures
- Kewaunee – Human Performance – failure to follow procedures and failure to provide procedures
- Kewaunee – Problem Identification & Resolution – inadequate problem evaluation
- Palisades – Human Performance – failure to use proper error-prevention techniques
- Perry – Human Performance – inadequate work control and planning
- Point Beach – Human Performance – not having complete or up-to-date documentation and work packages
- Point Beach – Problem Identification & Resolution – inappropriate or untimely corrective actions
- Quad Cities – Human Performance - inadequate documentation

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Event Response

Key Roles and Responsibilities

- Respond with a prepared emergency response organization.
- Participate within the guidelines of the National Response Framework (NRF).
- Monitor the licensee's activities to ensure proper mitigative actions are taken and perform independent assessments.
- Interface effectively with all external stakeholders.
- Offer assistance, within the context of State/federal protocol, to licensees and States.

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Event Response

- Monitoring Mode
  - Point Beach – Loss of Offsite Power (1/08)
  - Byron – Loss of Offsite Power (03/08)
  - Point Beach – Suspected Credible Bomb Threat Toward Plant (04/08)
  - Duane Arnold – Loss of Communications due to Flooding (06/08)
  - Fermi 2 – Loss of 75% of Annunciators (06/08)
- Special Inspection Teams
  - Point Beach – TDAFP High Bearing Temperatures (06/07)
  - Fermi – Potential Tampering with ERV Exhaust Piping (10/07)
  - Byron - Degradation of ESW Piping common to both units (12/07)
  - Perry – RCIC Controller Power Supply Failures (12/07)
  - Point Beach – Transformer Cable Failures (01/08)

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Reactor Program Initiatives

- Heavy Loads
- Fire Protection
- Materials Issues
- Security
- Tritium

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Reactor Program Challenges

- Staffing
  - Attracting and Retaining Qualified Staff
  - Budget for feeder positions
- Communications

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Region III Independent Spent Fuel Storage Installation Inspection Program

Sarah Bakhsh, Reactor Engineer

Division of Nuclear Materials Safety

Decommissioning Branch

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Purpose

Determine that activities are accomplished safely in accordance with the commitments and requirements contained in the Safety Analysis Report, NRC's Safety Evaluation Report, Certificate of Compliance for the dry cask storage system design being used under a general license or the license and technical specifications for an ISFSI operated under a specific license, the licensee's Quality Assurance program, and 10 CFR Part 72.

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ISFSI Inspection Phases

Phase 1 - Design, fabrication, and construction

Phase 2 - Preoperational testing, including dry runs

Phase 3 - Spent fuel loading operations

Phase 4 - Storage monitoring of the loaded ISFSI

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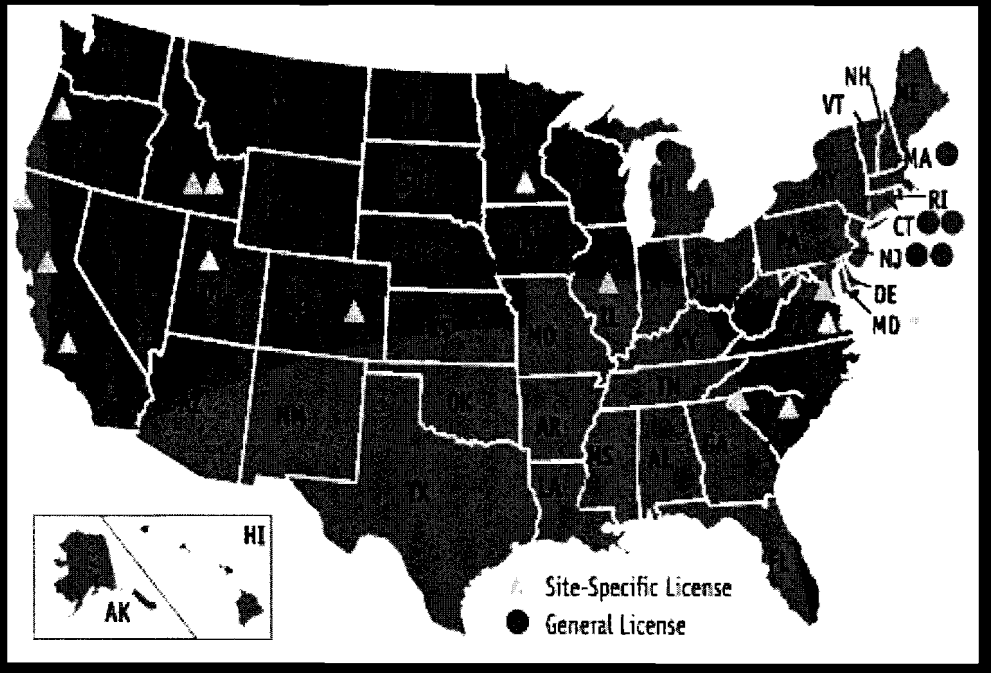
Region III ISFSI Sites

Construction (1)
- Byron
- Kewaunee
- LaSalle

Pre-Op Testing (2)
- Monticello
- Kewaunee

Operating (3&4)
- Big Rock Point
- Davis Besse
- Dresden
- Duane Arnold
- GE Morris
- Palisades
- Point Breach
- Prarie Island
- Quad Cities

Future Sites
- Braidwood
- DC Cook
- LACBWR
- Zion
- Fermi
- Perry



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Pad Construction (1)

- Subsoil Backfill and Compaction
- Rebar Placement
- Concrete Testing and Placement
- QA / QC Oversight

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Pre-Operational Testing (2)

- Cask / Heavy Load Lifts
- Verification of Fuel Selection and Characterization
- Canister Sealing Operations
- Vacuum Drying and Gas Backfilling
- Placing the cask or canister in the ISFSI
- Training Reports

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Spent Fuel Loading and Unloading (3)

- Observe All Demonstrated Activities
- Fuel Selection and Characterization
- Review Loading Package

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Storage Monitoring (4)

- Environmental Reports
- Crane Preventive Maintenance
- Condition Reports
- 10 CFR 72.48 Revisions
- Surveillance Reports
- Procedure Changes

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Reactor Oversight Process Roundtable Discussion

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ROP Round Table Discussion

- Resident Inspector Program
- Byron Essential Service Water Finding & Application of SDP Process
- Perry SCRAM/Digital I&C
- Tritium
- Operating Experience Use In Region III

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Resident Inspector Program

- Serve as the Eyes and Ears of the Agency
- Implement Baseline Inspection Program
- Daily Corrective Action Document Reviews
- Byron Essential Service Water Issue

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Daily Schedule

- 0615 – 0645 Review logs, issue reports
- 0645 – 0730 Tour Main Control Room
- 0730 – 0800 NRC Conference Call
- 0800 – 0830 Admin review, preparation
- 0830 – 0900 Plan of the Day meeting
- 0900 – 1130 Inspection activities
- 1130 – 1215 Lunch
- 1215 – 1300 In depth plant issues review
- 1300 – 1500 Inspection activities

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Inspection Activities

Adverse Weather	Licensed Operator Requalification	Post Maintenance Testing	Problem Identification & Resolution
Fire Protection	Maintenance Effectiveness	Refueling Outage Activities	Event Response
Equipment Alignment	Maintenance Risk and Emergent Work	Surveillance Testing	Performance Indicator Verification
Flood Protection	Operability Evaluations	Permanent and Temporary Plant Modifications	Security

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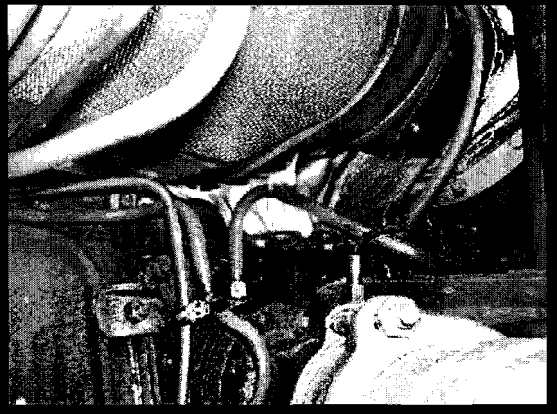
Eyes and Ears of the NRC



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Byron Essential Service Water Pipe Failure

- Issue Initially Identified Via Corrective Action Document Review
- Infrequently Accessed Area
- Severe Corrosion of Pipe Wall
- Thru-Wall Leak and Dual Unit Shutdown
- NRC Special Inspection Initiated

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Byron Special Inspection Results

- One Finding with Two Violations related to the ESW Pipe Corrosion
- Missed Opportunities; To Prevent, For Early Identification and To Take Timely Corrective Actions for Pipe Corrosion
- Final SDP Evaluation of White
- Proposed Change to ROP Regarding Inspection of Normally Inaccessible Areas

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As-Found Condition of Risers

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OC ESW Riser Leak

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SDP Evaluation of ESW Finding

- Pipe rupture resulting in loss of ESW is the dominant risk concern
- Degraded riser piping represented an increased pipe rupture frequency
- SDP phase 2 processes not applicable
- No RASP manual guidance for SDP phase 3 analysis

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SDP Evaluation - Appendix M

- Planning SERP proposed use of IMC 0609 Appendix M to determine significance
- Risk insights used in qualitative assessment
- Frequency of rupture judged to be low but non-negligible
- CCDP for loss of ESW event is high (1.8E-2)
- Qualitative judgment considered extent of degradation, exposure time, and potential plant safety impact

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Perry SCRAM / Digital I&C

- Perry SCRAM on 11/28/07 due to Digital Feedwater Control System (DFWCS) failure
- Perry Reactor Core Isolation Cooling (RCIC) controller "tuning" issues
- Other RIII experience with digital systems

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Perry SCRAM due to failure of DFWCS

- Dual redundant power supplies failed in Input/Output portion of the system
  - Tripped feed pumps
  - Same failed component in both supplies
  - Provided erroneous information to operators

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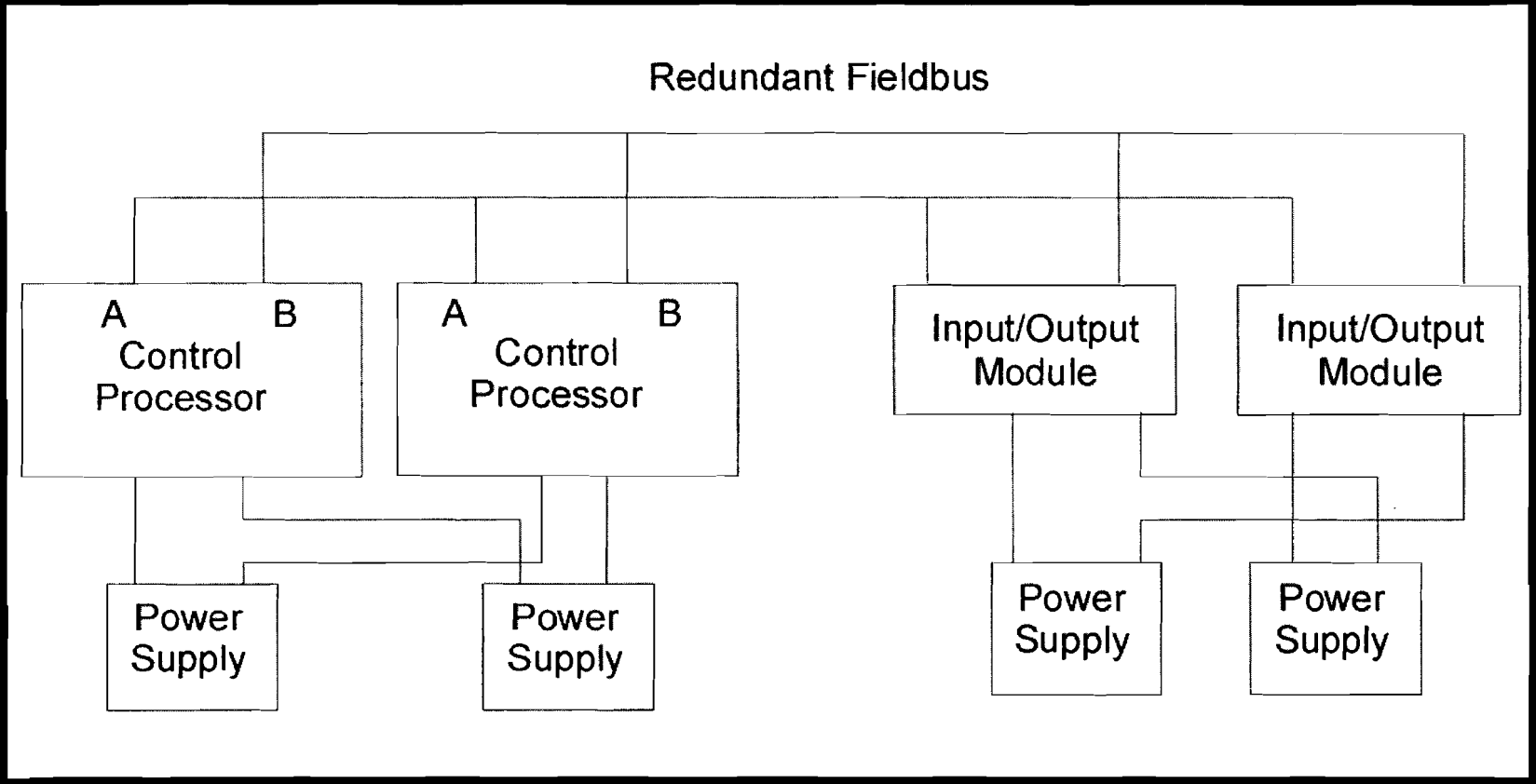
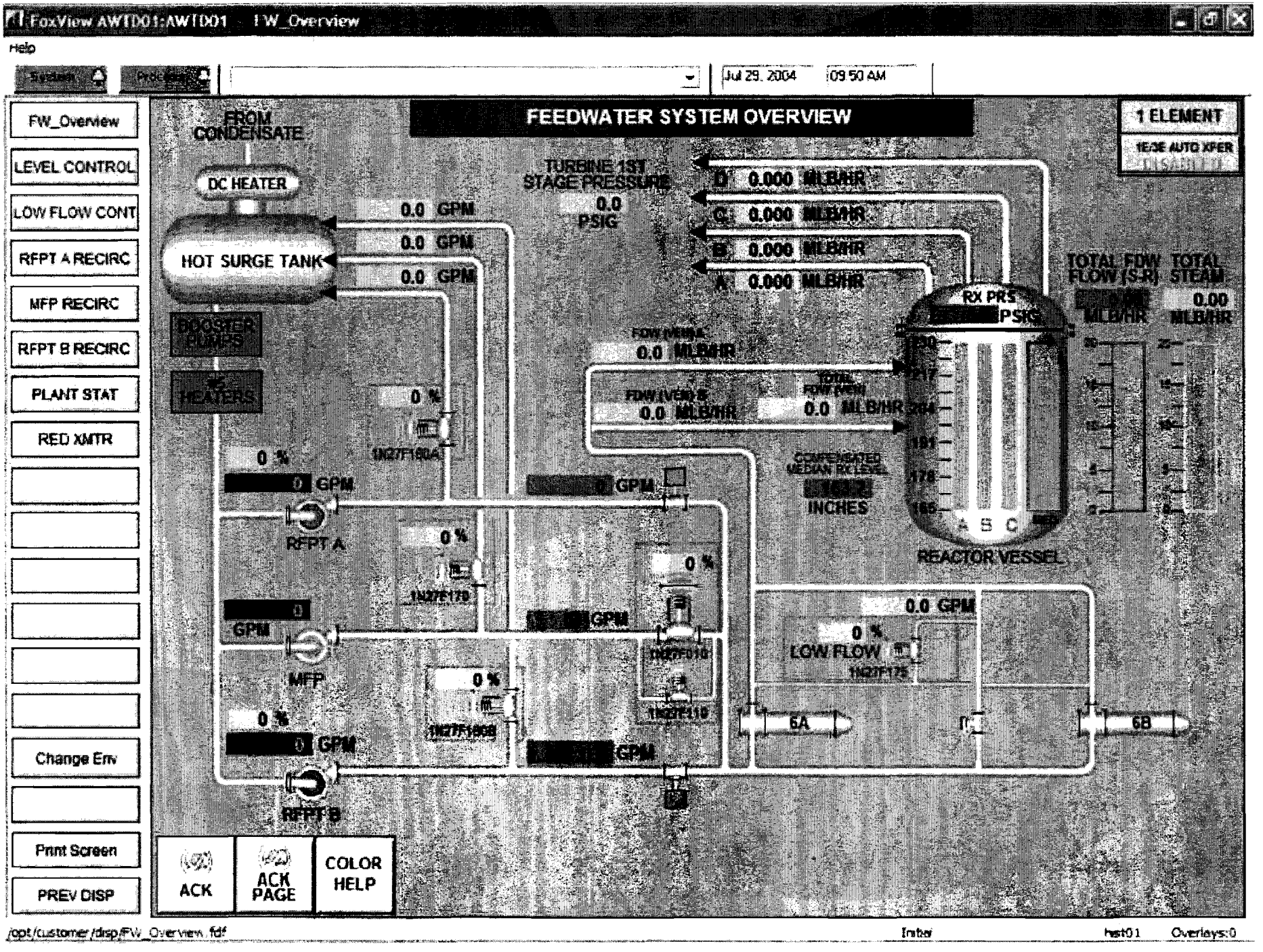
DFWCS

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RFPT A RECIRC
MFP RECIRC
RFPT B RECIRC
PLANT STAT
RED XMTR
Change Env
Print Screen
PREV DISP
FEEDWATER SYSTEM OVERVIEW
1 ELEMENT
FROM CONDENSATE
DC HEATER
HOT SURGE TANK
BOOSTER PUMPS
HEATERS
TURBINE 1ST STAGE PRESSURE
0.0 PSIG
0.000 MLB/HR
0.000 MLB/HR
0.000 MLB/HR
0.000 MLB/HR
RX PRS
PSIG
TOTAL FDW FLOW
TOTAL STEAM
0.00 MLB/HR
0.00 MLB/HR
FDW (MEAS)
0.0 MLB/HR
FDW (VERIF)
0.0 MLB/HR
TOTAL FDW (MEAS)
0.0 MLB/HR
COMPENSATED MEDIAN RC LEVEL
INCHES
REACTOR VESSEL
0.0 GPM
0 %
LOW FLOW
RFPT A
MFP
RFPT B
6A
6B
ACK
ACK PAGE
COLOR HELP
/opt/customer/disp/FW_Overview.fdf
[nav]
host01
Overlays:0

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SCRAM recovery complicated by RCIC failures

- RCIC incorrectly tuned in January 2006 using inadequate guidance.
  - Oscillations cause the controller to trip upon initiation
  - Operators were able to achieve flow in manual mode
- Periodic testing did not account for the differences in closed loop dynamics
- Similar to Limerick Unit 2 event, on 4/24/07

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Other RIII experience with digital systems

- LaSalle Site Area Emergency (2/20/06)
  - Rod Worth Minimizer (non-safety) gave confusing indication on rod position
- Digital feedwater control upgrades
- Exelon digital EHC upgrades
- Simple safety related upgrades
  - Evaluated under 10 CFR 50.59

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Region III Tritium Issues

- Braidwood Historical Leaks
  - Migration of Tritium
  - Region III Response and Inspection
  - Findings and ROP Assessment
  - External Communications and Outreach

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Region III Tritium Issues

- Agency Response and Initiatives
  - Generic Communications
  - Lessons Learned Task Force
  - Revision to Inspection Procedure
  - Revision to Regulatory Guides

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Region III Tritium Issues

- Licensee Response to Radioactive Leaks/Spills
  - Source Identification and Mitigation
  - Onsite and Offsite Monitoring
  - Assessment of Offsite Consequences
  - Communication with External Stakeholders

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Use of Operating Experience

- Communications to Inspectors
- Use of Smart Samples

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Communications to Inspectors

- OpE COMMs
- OpE Briefings
- OpE Issues for Resolution
- Technical Review Group Outcomes
- Review of Latest OpE Every Thursday

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OpE Smart Sample Process

- Additional tool for baseline ROP
- Minimal additional effort required
- Five OpE Smart Samples issued
- RIII Expectation is to use during baseline efforts
- Can Be accessed via OpE Gateway Website
- Recent OpESS - 2008-01 – Negative Trend & Recurring Events Involving Emergency Diesel Generators
- Document OpESS in the inspection report