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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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PLANT OPERATIONS AND FIRE PROTECTION SUBCOMMITTEE

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WEDNESDAY

JULY 24, 2013

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The Subcommittee met at the Nuclear Regulatory Commission, 2100 Renaissance Boulevard, King of Prussia, Pennsylvania, at 8:15 a.m., Gordon R. Skillman, Chairman, presiding.

COMMITTEE MEMBERS:

GORDON R. SKILLMAN, Chairman

J. SAM ARMIJO, Member

SANJOY BANERJEE, Member

DENNIS C. BLEY, Member

MICHAEL L. CORRADINI, Member

HAROLD B. RAY, Member

JOY REMPE, Member

STEPHEN P. SCHULTZ, Member

JOHN W. STETKAR, Member

NRC STAFF PRESENT:

QUYNH NGUYEN, Designated Federal Official

CAREY BICKETT, R-I/DRP/TSAB

CHRIS CAHILL, R-I/DRS

BILL DEAN, Region I Regional Administrator

MARC S. FERDAS, R-I/DNMS/DB

MEL GRAY, R-I/DRS/PB4

JUSTIN HEINLY, R-I/DRP/PB6/TMRO

RAY LORSON, R-I/DNMS

RAY McKINLEY, R-I/DRS/PSB2

AMAR PATEL, R-I/DRP/PB6/OCRO

RAYMOND POWELL, R-I/DRP/TSAB

DARRELL J. ROBERTS, R-I/DRP

JOHN ROGGE, R-I/DRS/EB3

JAMES TRAPP, R-I/DRS/EB1

ALSO PRESENT:

http://files.privateerpress.com/highcommand/Wa

*Present via telephone

TABLE OF CONTENTS

P R O C E E D I N G S

8:17 a.m.

MR. DEAN: All right. Well, good morning, everybody. This is a meeting, your meeting, obviously, a public meeting, and I'd like to have you provide any opening remarks before I have some and turn it over to the technical presentations from our staff. So let me hand it off to you first.

CHAIRMAN SKILLMAN: Yes, sir. Good morning. This meeting will now come to order. This is a meeting of the Plant Operations and Fire Protection Subcommittee. I am Dick Skillman, Chairman of the Subcommittee. ACRS members in attendance are Stephen Schultz; Sanjoy Banerjee; Dennis Bley; Harold Ray; Sam Armijo, the Chairman of the ACRS; John Stetkar; Joy Rempe; and Mike Corradini. The Official is Quynh Nguyen today.

As described in the Atomic Energy Act of 1954, as amended, the ACRS has statutory responsibilities to review and advise the Commission with regard to the licensing and operation of production and utilization facilities and related safety issues, the adequacy of proposed reactor safety standards, technical and policy issues

related to the licensing of evolutionary and passive plant designs and other matters referred to it by the Commission.

The purpose of this briefing is for the staff to discuss items of mutual interest, namely regional inspection and operational activities. The Subcommittee will gather information, analyze relevant issues and facts, and formulate a proposed position and action, as appropriate, for deliberation by the full Committee, if needed.

The rules for participation in today's meeting were announced as part of the notice of this meeting previously published in the Federal Register on June 21, 2013. The meeting will be open to public attendance, with the exception of portions that may be closed to protect information that is proprietary, pursuant to 5 USC 522(b)(c)(4). We have received no written comments or requests for time to make oral statements from members of today's meeting, from members of the public for today's meeting.

A transcript of the meeting is being kept and will be made available, as stated in the Federal Register notice. Therefore, we request that participants in this meeting use the microphones

located throughout the meeting room when addressing the Subcommittee. Participants should first identify themselves and speak with sufficient clarity and volume so they can be readily heard.

A telephone bridgeline has been established for this meeting. To preclude interruption of this meeting, please mute your individual telephones and lines during presentations and Committee presentations. I ask that you please silence all cell phones.

I would like to go around the room and ask the members to introduce themselves, please. Dr. Schultz?

MEMBER SCHULTZ: I'm Steve Schultz of the ACRS.

MEMBER BANERJEE: Hi. I'm Sanjoy Banerjee, also a member of the ACRS. Is this on?

CHAIRMAN SKILLMAN: I think there's a little switch to turn it on.

MEMBER BANERJEE: Yes. My colleagues say that I'm not very good at anything other than thermal hydraulics, so that's what I chair.

MEMBER BLEY: Hi. I'm Dennis Bley. I'm a member of the ACRS. I do electrical things and risk assessment operation.

MEMBER RAY: I'm Harold Ray, a member of the ACRS.

CHAIRMAN SKILLMAN: Dick Skillman, Chairman of the Subcommittee.

MEMBER ARMIJO: Sam Armijo. I'm Chairman of the ACRS. My background is in nuclear fuels, plant materials, and other things that I'm sure this region deals with.

MEMBER STETKAR: I'm John Stetkar. I'm a member of the ACRS. My areas of expertise are PRA and plant operations.

MEMBER REMPE: I'm Joy Rempe. I'm also a member of the ACRS. I also have a day job with Idaho National Laboratory where I'm a group leader in in-pile instrumentation development for the Advanced Test Reactor.

MEMBER CORRADINI: Mike Corradini. I'm a member. I'm at UW-Madison.

CHAIRMAN SKILLMAN: We will now proceed with the meeting, and I call on Mr. Bill Dean, Regional Administrator of NRC Region I, to make introductory remarks. I would like to offer this for Mr. Dean. Bill Dean became Regional Administrator for the Region I office of the NRC in October 2010. Region I is headquartered in King of

Prussia, Pennsylvania, where Dean oversees regulatory activities in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

Mr. Dean was an officer in the United States Navy's Nuclear Power Program. At this point, I turn the meeting over to Mr. Dean.

MR. DEAN: Thank you, Mr. Skillman. I appreciate the opportunity to host the Advisory Committee on Reactor Safeguards, in particular the Subcommittee on Plant Operations and Fire Protection. I understand you all had a good visit at Peach Bottom yesterday, so, hopefully, you got everything you needed. And we certainly appreciate Exelon's efforts to support the group there, a large group of people, and I think they did a great job.

Before we actually get into the technical presentations and some of my opening remarks, I do want to cover some, I guess, housekeeping items. First of all, for those of you who are not familiar with this building, there's multiple evacuation routes if we do have a fire or some other need to evacuate the building. You can see all the doors out here will lead you to exits.

There's exits out that hallway, and there's exits out that hallway into the main lobby. And so if there is an event, please follow those routes.

We do have security on the floor. This is a public meeting. One of the unique aspects of this building is that we actually occupy all of the second and third floors but only part of the first floor, so we don't have control over the whole building. And so if there are members of the public -- as a matter of fact, let me just ask are there any members of the public here? One? Do you want to introduce yourself, sir?

AUDIENCE MEMBER: No.

MR. DEAN: No? Okay. So we have one member of the public here and, of course, we have people on the phone. So we do have security here present, if need be.

Obviously, the meeting is being transcribed for the public record. And the teleconference, you know, we're using the microphones, but, to be honest with you, this building is only a little bit over a year old and we built a lot of good infrastructure into the building. Actually, the microphone system that we have in the ceiling is actually very good at picking

up voices. And, in fact, those of you in the audience, it can pick up your voices. So I would ask those of you in the audience to, you know, if you have to talk or whatever, maybe you can go out in the hallway because it will affect those people that are on the teleconference in terms of listening. So, really, the use of the microphones really is more for people in the room to be able to hear because the acoustics aren't that great, as opposed to people on the teleconference.

So if we do have to muster, the building is an L-shaped. We are on the long end of the "L" and the short end of the "L" is over there, and the parking lot is behind us. And you can see in the sort of cloud-shaped areas, those would be the areas that you would muster to if we do have to have an evacuation. So if you go out that direction, you go in that part of the parking lot. If you go out this way, you'd go in the other corner of the parking lot there. But, hopefully, this is not the day that we have an unannounced drill scheduled.

All right. Next slide. Thanks.

This is the agenda for this morning. I just wanted to take an opportunity to review that for those of you in the audience. We have several

technical presentations by my highly competent and knowledgeable technical staff. Carey Bickett and Ray Powell will be talking about fleet overview and reactor oversight process and performance. Jim Trapp, a branch chief in our Division of Reactor Safety, will talk about Seabrook, specific issues associated with the alkali-silica reaction, which is probably the most, I think, significant technical issue that we're dealing with here in Region I at this point in time.

Then we'll talk about our experiences with flooding and seismic hazard inspections, and we'll have our senior resident and resident from Three Mile Island where we had a finding of significance due to our oversight of the licensee's efforts and their flood evaluations talking about that.

Region I had the unique experience of interacting with Peach Bottom and the Office of Research in both the SOARCA study and the spent fuel pool study, which I know you're familiar with. And Chris Cahill, one of our senior reactor analysts, will talk to you about our experiences there. John Rogge, who's our branch chief responsible for fire protection and electrical, will talk to you about

some specific fire protection-related issues we've had here in Region I over the past year or so, including operator manual actions at Indian Point and NF PA 805 implementation.

After break, we'll talk to you about regional response to natural events. We've had several over the past couple of years, most recently Winter Storm Nemo and Hurricane Sandy last year. And Ray McKinley will help lead that discussion. He's one of our event response coordinators. And then the senior resident and resident from Oyster Creek, Jeff Kulp and Amar Patel, will talk to you about their experiences at Oyster Creek where we had a declared event as a result of Hurricane Sandy.

And then the final presentation will be by Marc Ferdas, a branch chief in our DNMS organization, who will talk to you about some unique materials-related issues dealing with reactor plants Crystal River and the Indian Point wet transfer, spent fuel wet transfer activities at Indian Point. So that's what we have set up in terms of technical presentations for the Committee today.

So in terms of our mission here in Region I, we inspect, assess, and oversee the safety performance of 26 operating nuclear reactors; 16

independent spent fuel storage installations; 4 nuclear reactors that are currently in safe store; and over 900 material licensees, one master material licensee, the U.S. Navy, and nine complex decommissioning sites, to ensure adequate protection of public health and safety and the environment.

In Region I, we operate in a fairly unique environment compared to our peers in the other three regions, given the very interested political and public interest in many of the facilities and what's going on in the nuclear world in Region I. And that certainly challenges us on a daily basis in terms of assuring that we have adequate communications and information available to the public and available to our staff to be able to deal with the members of the public and the political and state and local stakeholders that we deal with. So that does provide a daily challenge for us, and it does give us a unique operating environment.

(Teleconference dialing.)

So maybe we'll wait for that -- okay, okay, good. We want you to feel at home. So my assumption is either we lost the connection and have to redial.

Okay. So let me continue on. Region I, we have about 233 staff. About 135 are actual inspector qualifications, and, of those inspectors, almost one-third of our inspectors are actually the resident site, senior resident inspectors at the sites.

Just a little bit of data relative to the last calendar year, which is how we do the reactor oversight process, by calendar year. So it was reactor oversight process year 13, calendar year `12. A hundred and sixteen thousand-plus hours of inspection and related activities associated with our oversight and inspection of nuclear facilities. That included five supplemental inspections and one reactive inspection, which actually isn't too bad when compared to some of our peers. I think you all know that Region II and Region IV have had some really significant challenges with Brown's Ferry and Fort Calhoun, in particular, of course, all the activities at San Onofre. And, of course, Harold, I'm sure very close to you in terms of what's going on out there at SONGS.

CHAIRMAN SKILLMAN: Bill, I would like to ask a question here.

MR. DEAN: Yes.

CHAIRMAN SKILLMAN: Your baseline inspections, 116,000 hours. How would that amount of hours compare with the other regions?

MR. DEAN: It would be probably, probably a little bit less than Region II and Region IV, given some of the significant inspection activities they've had there. We have actually provided some of our inspection assets to both Region II and Region IV to support, for example, the 95003 inspection at Brown's Ferry and a lot of the inspections that are being done at Fort Calhoun, you know, as they recover from their flooding event and all their significant -- so I would say that's probably a little bit less than those two regions because of the special inspections. Probably equivalent to Region III.

CHAIRMAN SKILLMAN: Thank you.

MR. DEAN: Yes, okay. One thing that's not in here that was unique for Region I last year was that, for the first time in quite some time, there was an extended strike action at a nuclear power plant. Pilgrim Nuclear Power Plant had a fairly lengthy strike outage, and so we had augmented coverage at Pilgrim Nuclear Station for what? Three or four weeks, was it, Daryl, at

Pilgrim? Yes. So that was a pretty unique activity for us, and if you're interested in that we can certainly get some of the people that were involved in that to talk to you about how that occurred.

And then a nuclear materials program, 320 inspections and 580 licensing actions in fiscal year `12, also oversight of the Navy Master Materials License. And then there's 16 agreement states that exist in Region I, and I'll get to a slide there in just a minute on our materials program.

In terms of the reactor sites, 26 operating reactors in Region I evenly split between BWRs and PWRs. We have all the PWR vendors represented to some degree in Region I and then a collection of both Mark I and Mark II containment BWRs.

I will note that we have three of the four oldest reactors in the United States in Region I. We have, five of our sites have entered their period of extended operation, so we do have, perhaps relative to some of the other regions, an aging fleet in Region I, and that certainly gives us, potentially, some challenges in terms of new emerging events and activities that aging plants

might go through.

I already mentioned the 980 materials licensees, and those are located in four states and three territories. Delaware, Connecticut, Vermont, and West Virginia, then the District of Columbia, Virgin Islands, and Puerto Rico are the areas that we have actual oversight of. All the rest are in agreement states.

The 16 independent spent fuel storage installations, 10 of them are inside protected areas. You saw one of them yesterday at Peach Bottom. Three are outside a protected area but inside the owner-controlled area. And then three stand alone: Connecticut, Yankee oriented ISFSIs.

Four nuclear reactors in safe store, and then a total of nine complex material sites and research reactors that are undergoing decommission.

MEMBER CORRADINI: Just out of curiosity, what are the research reactors or research test reactors?

MR. DEAN: Let's see. Marc Ferdas? Use a mike, Marc? Yes. Marc Ferdas is the branch chief of our decommissioning branch.

MR. FERDAS: We have our University of Buffalo, WPI, and I think there's two. We finished

one last year as a carryover.

MEMBER CORRADINI: Thank you.

MR. DEAN: Thanks, Marc. And then the next slide. Just in terms of geographic, all of our plants were fairly compact, which is actually pretty good in terms of being able to get to all of our sites fairly easily from the regional office, you know, not some of the challenges that maybe some of our other regional brethren face.

And then the next slide actually shows you the materials program. We actually have both the southeast part of the United States, as well as the northeast and mid-Atlantic regions. And so that was something that several years ago, as part of, you know, developing where best to have our assets.

The Region I took over Region II's materials program. They have responsibility for all the fuel cycle facilities in the United States. So that was done a few years ago. Yes, Steve?

MEMBER SCHULTZ: So, Bill, then could you compare your activity level associated with reactor inspections and your nuclear materials program? This looks like a pretty hefty focus related to the agreement states.

MR. DEAN: It is. It is a pretty hefty focus in terms of agreement states. And to be honest with you, some of our biggest challenges actually occur in Puerto Rico. A lot of challenges in dealing with materials licensees in Puerto Rico. But given the fact that we only have four states and the District of Columbia, you know, in terms of the eastern part of the United States under our purview, you know, working with the agreement states and the Office of FISME in terms of the agreement state oversight program, I think that works pretty well. We have really good relationships with most of the states in terms of dealing with issues. Pennsylvania, for example, you know, a great relationship with them, and they're a fairly active state.

So I think our agreement state program is fairly healthy. We do have some, you know, periodically with state budgets and things like that, some challenges there. We did have the state of Georgia just recently go on probation, the first agreement state to be put in probation, and so, obviously, some challenges there in terms of overseeing and working with them to help them improve and re-establish their program, you know, to

where it needs to be. But for the most part, I think the agreement state programs have done pretty well.

MEMBER SCHULTZ: Thank you.

MR. DEAN: Yes, thank you. And then the last thing I want to talk about before I turn it over to my staff is just some unique plant transitions that are impacting Region I sites. Crystal River, effective August 1st, we'll actually have oversight responsibility for Crystal River as a decommissioning site, so that's actually been a pretty unique activity over the last four or five months that Marc Ferdas, who just spoke, will have responsibility for. And so that will give us an opportunity to travel down to Florida more than we typically do.

Indian Point, Unit 2, this September will reach the end of their initial license period and begin entering their period of extended operations without a renewed license, the only plant in the country that will have had to employ the provisions of timely renewal from the license renewal rule. We have worked with the licensee to essentially have them make commitments to implement those activities that they would have implemented if

they had had a renewed license so, basically, all the aging management programs and so on. And so I think that's a very positive outcome that they will, in effect, put in place all the things that they would have had to have done if we had given them a renewed license.

And, of course, that's tied up in two things. One is the very extensive number of contentions that were filed at Indian Point for the license renewal process, and those have not yet been completed and probably are at least a year away; and, of course, the waste confidence issue and the order that the Commission provided the staff to not issue any renewed licenses until the waste confidence rule and policy is revamped.

And so we believe Indian Point will be the only plant in the country that will get into that situation. But we feel fairly confident that, given the fact that they will be committing to put in place all those programs, that they will have, in effect, all the things that we would expect a plant to have in a period of extended operation.

MEMBER RAY: Bill, is there any particular time limit on how long they'll continue that way?

MR. DEAN: There is not, and I'm not a lawyer and I don't play one on TV. But, you know, the lawyers, as we were talking about how to deal with Indian Point, you know, the Office of General Counsel was very concerned about anything that might undermine that aspect of the license renewal rule, which was the timely renewal provisions. But, you know, how long could it be? You know, it's indeterminate. I mean, we have research reactors, I think --

MEMBER CORRADINI: I was just going to say, research reactors, Wisconsin went for ten years.

MR. DEAN: Right, right.

MEMBER CORRADINI: In a timely renewal.

MR. DEAN: Yes, so there is no time limit, but we think that, hopefully, between dealing with the contentions and completing that process and the waste confidence, looking at the end of next year. Hopefully, it won't be, it won't be too long.

MEMBER BANERJEE: What is this contention process you said would take about a year?

MR. DEAN: The question for those of you in the audience is about the contentions at Indian

Point. There were, I think, I forget the exact number, 15 to 17 contentions filed related to the license renewal application from Indian Point, and each of those has to be dispositioned by the licensing board that is formed to deal with those contentions.

And so they've had hearings in the vicinity of Indian Point. They're planning more hearings to review the contentions. But, you know, my understanding is that it will probably take at least a year for them to get through all those contentions, resolve each of them, and make their rulings and whether there needs to be anything done relative to the license, any other commitments, or things that the licensee has to do.

And, of course, we also have challenges in the state of New York with the water quality certificate and issues associated with the state providing that water quality certificate. They have initially denied that. That's under appeal. And so there's that question there in terms of issuing a renewed license if the state does not issue or denies the water quality certificate. So there's some challenges up there in terms of the whole process.

And then the last thing is Oyster Creek. Oyster Creek had received a renewed license. But in agreement with the state of New Jersey, they agreed to shut down the facility in 2019. So, basically, that would be ten years into their period of 20 years of extended operation. And that was done to, basically, avoid having to build cooling towers, which is what the state was going to require of them, and so they've reached that negotiated settlement.

And so they'll be shutting down in 2019, so that will provide us with some unique challenges in terms of oversight of Oyster Creek over the next four or five years as they begin to move into decommissioning phase and so making sure that they are continuing to invest in the plant and operate the plant safely. We may end up putting in some unique oversight activities to look at Oyster Creek.

So that was it in terms of opening remarks. Sam?

MEMBER ARMIJO: In the case of Oyster Creek, a number of commitments were made for operation or prior to operation in the period of extended operation. Now, besides reducing the time period from 20 years down to 10 years, is there

anything that is not going to be done that was committed to be done to maintain the plant the way it should be?

MR. DEAN: There's nothing that the licensee has indicated that they would not that they've committed to do. I will say that they are probably looking carefully at things that would require a significant investment of capital, you know. If they had to, for example, replace their condenser, you know, that may be something that they would look at in terms of is that an investment that we would want to make?

But, really, it's large capital investment activities. It's not the commitments in terms of programs and processes that they committed to as part of their renewed license. All of those programs and processes are in place.

Okay. If there's no other further questions from the Committee -- yes, sir, Harold?

MEMBER RAY: Well, you mentioned some things that were unique in the set of plants that you are responsible for. One you didn't mention that I think you share with Region II is probably more plants that are subject to market revenues for their viability, and there's been some talk or some

comment by owners about having to reduce staff in order to maintain earnings in a challenging market environment. Does that, do you have any comment about how that may be affecting your activities?

MR. DEAN: We had a little bit of exposure to that with Vermont Yankee. Vermont Yankee was going through other issues with the state of Vermont relative to the Certificate of Public Good. And, you know, as we were looking to, we had not yet issued the renewed license, and, you know, there were concerns there about what would happen from a legal perspective.

And so we actually implemented an aspect of the reactor oversight process where we did, basically, a quarterly assessment of Vermont Yankee and looked at things like staffing levels. We looked at things like capital investment where they continue to invest in the plant. Was there a departure of qualified operators at a high rate from the plant? So looking at those sort of things for a plant that was potentially in financial difficulties, you know, trying to get a sense of whether those were showing some impact at the plant.

Currently, Entergy has made some announcements about some restructuring and

downsizing. And so it's obviously something that we would closely look at in terms of plant performance. In my discussions with Entergy management, many of the aspects of their restructuring or reorganization really are not oriented around plant activities but really more of a corporate infrastructure and oversight of these plants.

So, obviously, it's something that we would have to keep an eye on, but I think our reactor oversight process gives us the tools that we need to be able to continue to inspect and provide oversight of these facilities. But that is, that is a forthcoming challenge, and I'm sure all of you have read trade press about, you know, rumors about certain plants potentially, you know, ceasing operations just because they're not financially viable, and that's certainly something that could, indeed, exist in the landscape in all the regions.

MEMBER RAY: Yes. I think the concern probably isn't so much, from our standpoint, a prospect of having to make a decision to shut down as it is a decision to continue to try and hang in there with reduced resources. So I was interested in your awareness, basically, following that.

MR. DEAN: Yes. We're aware, and,

obviously, we're not seeing anything at this point relative to -- obviously, there's requirements for things, like operators. Technical specifications require a certain amount of staffing. Emergency response staffing, there's activities going on as a result of post-Fukushima looking at, you know, what's needed for emergency response and the staff that needs to be at the site, particularly multi-unit sites now. And so those are certainly things that we are looking at in the prism of post-Fukushima activities. But at this point in time we have not seen anything that has affected any of our sites in terms of staffing or performance.

Okay. Yes, sir?

MEMBER SCHULTZ: Bill, just tying the last two questions together, the focus that you had at Vermont Yankee associated with staffing and performance both, it seems as if that type of focus ought to be paid for Oyster Creek as they go through the next six years focusing on where they are with regard to overall capability in their staffing program and how they maintain that.

MR. DEAN: Yes. Steve, you're exactly right. And, in fact, we're coming up to, you know, twice a year we have an assessment process, and

we're coming up in a couple of weeks to our mid-cycle assessment. And this has actually been something that we've been discussing over the last year or two as we've done our semi-annual assessments is, you know, when is the right time to put in something that provides that additional oversight, like we did at Vermont Yankee and Oyster Creek. And I think the time is coming up pretty soon to put in some special activities.

MEMBER SCHULTZ: Yes, that's good because what would be very good to have available now would be that would demonstrate how you would carry that through and demonstrate their continuing capability.

MR. DEAN: Yes. One of the things that Oyster Creek did was provide some, you know, golden handcuffs on key members of the staff. And my understanding is that, in the next year or two, some of those expire, and so that really will be an interesting time to see what happens as, you know, people may be looking for other opportunities elsewhere.

CHAIRMAN SKILLMAN: I would like to join this discussion from this perspective. My experience is that, as the utilities become more and

more concerned about finances, many times the first programs that go are the ones that surround and support the maintenance role, whether it's 8910, DQ, hydrogen line break. And, unfortunately, by the time the utility recognizes there are problems, they have more red systems in A1 for 5065 than they anticipated they would have. And by that time, the infrastructure has begun to fall apart.

And so I join Harold and Steve in their concern. If the leading indicator is an announcement that finances have become tight or there might be compromise in finances, there should probably be a thick magnifying glass right now on what is being done to protect, particularly, the critical systems. And I have ever confidence that the people operating the plants are well aware of this issue, but it doesn't take many errors or slips or failures to perform to push systems into A1 and get into system health red, which is where we don't want these, particularly the older plants because they may have fragility that is not fully understood. So I join Harold and Steve in expressing this concern.

MR. DEAN: Thanks. Thanks, Dick. And I think, as a matter of fact, our next presentation, I

think Ray Powell and Carey Bickett are going to talk to you a little bit about what's going on with the ROP enhancement process, and that's something that, you know, personal input that I've given to the individuals who are managing that evolution is along those lines: with an aging fleet, do we have the right inspection program now, in terms of looking at things like aging management programs and so on?

You know, we go through a pretty intensive inspection activity to get to the point that a plant gets their license renewed. But what have we embedded into our ongoing programs for overseeing those, you know, passive components and things like that that perhaps weren't areas of focus in the existing reactor oversight process? And so, hopefully, Ray and Carey will have a chance to touch on that.

And that might be a good time to, perhaps, segue to Carey Bickett and Ray Powell. Thank you.

MR. GRAY: Just mike etiquette. I'm Mel Gray. I met you gentlemen and ladies yesterday. Those mikes, the closer you are we can really hear you and hear you out here, as well. Also, there's like a three-second time delay when you hit on, so I

thought I'd just share that.

CHAIRMAN SKILLMAN: Thank you.

MS. BICKETT: Can you hear me? Is my mike working? All right. Good morning. My name is Carey Bickett. I'm a Senior Project Engineer in the Division of Reactor Projects. And we're going to give a quick fleet overview, excuse me, quick fleet overview and reactor oversight process performance.

The agenda for this discussion. We're going to do a quick action matrix summary, talk about substantive cross-cutting issues from the 2012 end-of-cycles. Bill did mention our mid-cycles are coming up in August, so this information is a little bit dated. And the third item is the reactor oversight process improvement initiatives.

Next slide, please. Bill had a similar slide. I wanted to put it up again just to kind of give you an overview of what fleets are in Region I. As you can see, Entergy and Exelon are the biggest fleets in the region, and a lot of these fleets also cross other regions, too.

This is the action matrix summary. As I said, it's of June 7th of this year. Beaver Valley 1 and 2 in the regulatory response column. FitzPatrick, Nine Mile Point 1, Susquehanna 2, and

Three Mile Island are also in the regulatory response column. All our other plants are currently in the licensee response column.

The Beaver Valley 95001 supplemental inspection was completed in June of 2013, and the follow-up assessment will be issued with the mid-cycle letter. The Nine Mile Point supplemental inspection is currently scheduled for October. And to date, we haven't received information from other sites indicating that they're ready for their supplemental inspections.

CHAIRMAN SKILLMAN: Carey?

MS. BICKETT: Yes.

CHAIRMAN SKILLMAN: If I can, I would like to offer this question. Many of these items surfaced because of plant performance issues, the plant doesn't behave the way it was intended to behave or expected to behave, or the finding is a finding from an item that is relatively obscure. The real question is are you seeing a pattern of either inattention by personnel, new people that really don't understand what the functional performance requirements are of the device that caused whatever it was that put the plant on the action column? Is this an underlying people issue,

or is this an underlying plant hardware issue, or is it a combination that you can speak to, please?

MS. BICKETT: That's a great question. I don't know that I have the details on all these findings. Do you have more information?

MR. POWELL: If I can -- I don't have a microphone. Can everybody hear me? I respectfully think it's a combination of both. We've seen examples where it is, in fact, a hardware issue. We've seen other examples where processes and procedures over time aren't necessarily maintained the way they should be.

And your comment on the experience level is very interesting. I was at a public meeting with industry just last Wednesday, and, as they tend to do, they brought up the maturity of the industry and the NRC panelists, of which I was one, kind of pushed back with the plant may have been here four years, but, if your engineering staff has been here on the average of two or three years, it isn't as mature. And we really encouraged them to keep their focus on those areas because I think sometimes there's a confidence on maturity that may not be there.

CHAIRMAN SKILLMAN: Raymond, when you

communicated, in some cases, did you find that the process or the procedures have not been kept up-to-date? Are these failures in configuration control and configuration management by the plant leadership? Do I need to speak again?

MR. POWELL: Yes, please.

CHAIRMAN SKILLMAN: What I'm really wondering is is there something missing in configuration control? As I hear you speak, I'm saying why haven't the dots connected? Is the plant not understanding, leadership or the people not understanding how the parts fit if you say it's partly hardware but it's really procedures processes? The paper is old. It doesn't represent, perhaps, the present configuration. Are we missing something? And my underlying concern is is there something lying ahead that's more serious? That's really what I'm thinking about.

MR. ROBERTS: Good morning. We met yesterday. Thanks for coming to the region. To address the specific items up here, which are our five plants that have moved to the right-hand side of the action matrix, many of those are, I would say that most of those are equipment-related issues. There's a longstanding design issue with the Three

Mile Island flooding problem. I wouldn't say that any of these are reflective of configuration control problems. In most cases, they were equipment issues that you could attribute to maybe some aging, maybe some just equipment degradation. One was storm related. One of the scrams associated with Nine Mile Point was scram related or storm related. FitzPatrick has had longstanding issues with their condenser, which they're going to have to fix with a design or a major modification or major maintenance evolution down the road.

So a lot of these specific cases -- and Beaver Valley, of course, is security-related issues. So I wouldn't lump any of these to configuration control, per se, these particular issues. So I don't think that there is a concern about missing something in that regard.

CHAIRMAN SKILLMAN: Thank you.

MS. BICKETT: All right. Next slide, please. At the 2012 end-of-cycle assessment, we only had one plant with any substantive cross-cutting issues, and that was Susquehanna. At that assessment meeting, we closed the H.2(c) procedure adequacy substantive cross-cutting issue, and we maintained the P.1(c) problem evaluation substantive

cross-cutting issue. Based on that, they didn't meet the exit criteria by the 2012 end-of-cycle assessment.

Next slide, please.

MR. POWELL: Mr. Skillman, I share your ability with these things, so I'm just going to hold this, if it's okay. As we were putting the agenda today together, I was asked to talk to the last few bullets on this slide. And while I was thinking about how to approach that, I realized that if I didn't include the first three bullets, I'm really not going to do our process justice.

The bottom two reflect one-time special efforts that were undertaken to review the effectiveness of the ROP and look for enhancements or improvements. But to just talk to that might lead to the impression that the process does not undergo continuous evaluation and review and, in fact, it does. We are in the 14th year of the ROP, which we call ROP 14, and the process has undergone constant review, and it's adjusted based on lessons learned and operating experience.

The top bullet talks to our feedback form process, which is a very strong program. Our program office does a good job of administering

that. Any staff member can identify an issue. It can range from a technical error in a procedure to a, hey, I think we should be looking at aging management, for example, in this procedure. So any topic is fair game for feedback forms.

Just go give you an idea of the quantity, my branch alone has submitted almost 40 this year. So it is actively used by the inspection staff, and the program office, like I said, does a good job. You usually get a notification the same day that your form has been received. You're contacted by the procedure owner or manual owner usually within a week or so. And if it's a minor change, they might wait for a biennial update, which is fine. But if it's more significant, it's reviewed and referred to one of the various working groups, and the working groups will evaluate the issue and will then change, as appropriate.

The second bullet talks to our annual review. This is a formal self-assessment that is reported on to the Commission each year. There are quantitative and qualitative metrics, and we assess the program against each annually. There's a bullet there that talks to a biennial internal survey. I really should have a third bullet which talks to a

biennial external survey. We kind of alternate years on the surveys as we try to get feedback on the program from as many people as possible as we're evaluating operator performance, aging management, etcetera.

Yes, sir?

CHAIRMAN SKILLMAN: I'm going to remind everybody to please identify themselves before they speak. Dr. Bley?

MEMBER BLEY: Now I forgot what I was going to ask. Who does the external surveys? Another region or headquarters or somebody even further --

MR. POWELL: The Division of Inspection and Support, Regional Inspection Support out of the headquarters office does the internal and external surveys.

I broke the rules, so I'm sorry. My name is Ray Powell. I'm the branch chief of the Technical Support and Assessment Branch here in Region I.

CHAIRMAN SKILLMAN: Thank you.

MR. POWELL: The third bullet. Typically, we would do it by annual review, which is an internal process. My counterparts in the other

regions, the program office, and the procedure owners, it's usually about a two-day VTC where we go through procedure by procedure looking at are the number of hours allocated to this procedure appropriate, are there procedures where we're just not finding anything? And sometimes that's okay. We're not finding anything because the licensees know we're looking, and that's a good thing. But other times, you really wonder whether we might get more bang for our buck looking at other things. And we do that every other year.

However, this would have been the year we're doing it, but that was tabled this year in lieu of the former, which is the enhancement project which Mr. Dean mentioned earlier. And I have a separate slide on that, so I'll talk to that in just a moment.

The last item is an independent assessment, a one-time effort that was directed by the Commission. Brian McDermott out of headquarters is leading that. The team is composed of people no longer associated with the ROP but who previously had experience. All of them, I believe, were inspectors or branch chiefs at one time. I've been told that we should see a report from Mr. McDermott

around Labor Day. I don't know that for certain.

The impact of the independent assessment was we had already begun the enhancement project, but, knowing that we're going to be getting this input -- next slide, please -- what we did was we kind of tabled part of the enhancement project for the time being. The independent assessment is not building into the baseline inspection program as much as the ROP enhancement team is, so we continue with that effort. As I said, I was at a meeting last week to get external stakeholder feedback. There were representatives from industry, the NEI, the Union of Concerned Scientists. It was a pretty good meeting with a lot of information exchange.

As noted on the chart, the assessment of the communication time are on hold for now. We will resume that.

As part of the enhancement project, the data collection has to end at some point, and there's a Federal Register notice out seeking input from anybody who would like to comment on anything. That notice closes this Friday, so, at that point, we will probably move forward with developing recommendations, and we can make changes as a result of that effort, which doesn't mean to say if

somebody has input two months down the road it won't be considered. If you go back to the previous slide, we are always seeking input, either formally or informally, through a number of mechanisms.

The last slide is -- I borrowed this from my friends at headquarters. It's the stated purpose of the enhancement program. We're looking to eliminate any redundant areas, looking at inefficiencies. But equally as important is what are we not looking at, what are we not inspecting, given the current environment, that we should be? Aging management is certainly the core front of our thoughts. There's a number of other topics and issues, also.

We'll take any questions. That's all that I have.

CHAIRMAN SKILLMAN: Members, any questions for Raymond?

MEMBER REMPE: Okay. Last Monday, we had a meeting --

CHAIRMAN SKILLMAN: Could you identify yourself?

MEMBER REMPE: Oh, I'm Joy Rempe. I am a member of ACRS. Anyway, on Monday, we had a meeting at headquarters to talk about what would be

needed with the new designs for the reactor oversight process, and there was quite a bit of discussion amongst the members and the staff. And I guess I was wondering if, one, you had any ideas of how you will deal with this; and, two, did they ask for your inputs? I didn't hear them discuss if they had discussed this with some of the regional members.

MR. POWELL: Ideas? Not immediately, but it has been discussed and it is, certainly, on the table for the group effort. It was mentioned several times at last week's public meeting, so we are considering that. I don't have an immediate solution, but it will get addressed.

MEMBER ARMIJO: Yes. Sam Armijo. I'd like to get back to the Oyster Creek issue. As you know, Oyster Creek, when we reviewed that for EPU, there were a number of materials degradation issues that were concerned, particularly containment. And a number of commitments were made to the NRC or to assure that the plant would operate safely during the EPU. Apparently, between the state of New Jersey and the licensee, they reached an agreement to operate the plant for only 10 of those 20 years, and I just am concerned that some of those

commitments that were made may be put aside or deferred or reduced in scope in some way that the NRC isn't a party to, you know.

So my question is has the NRC reviewed the agreement between the state and the licensee, particularly those, to be sure that none of the commitments that were made regarding the safety of the plant during the period of extended operation, that none of those commitments were reduced to such an extent that it would really not actually be a fulfillment of those commitments when we look at what was committed? Is there a document that says, okay, they were going to do so many containment inspections, they were going to do this level of repair or maintenance, but they're not going to do that anymore if it's only going to operate for 10 years instead of 20? Do we have that kind of level of detail?

MR. ROBERTS: We do conduct inspections during outages to look at those specific commitments you're referring to. There are dry well related, dry well shell inspections that the licensee committed to that we look at. Our ISI branch led by Jim Trapp currently looks at that periodically. We haven't received any documentation or letters from

Exelon indicating that they plan to cut back or reduce any of those commitments, and so our expectation is that when we verify this when we do these inspections that they are completing those commitments, as was promised.

So, you know, we are looking into that or we look at that as part of our baseline inspection program. And we have the same expectation that you would.

MR. POWELL: I guess I'd just close with we did mention Oyster Creek a couple of times and that there are other plants. Prior to some of the recent events, such as Kewaunee, through our feedback form process we had initiated action at the program office to start looking at how the inspection profile should change. I guess we're going to benefit from Kewaunee kind of getting the trump on us. I know it's certainly an active topic, and I would look for inspection program changes as a result.

And if there's nothing else, I'd like to introduce --

MEMBER SCHULTZ: Excuse me. Steve Schultz. One question for your presentation related to the internal reviews associated with the

inspection program reviews. My question is you talk about the things that are done within the region and that focus. Is there interregional comparisons of the self-evaluation programs that are done?

MR. POWELL: Yes. Bullets, all three of them on the first slide I spoke to are all interregional. They're coordinated by the program office. There's the TSAP, the Technical Score and Assessment Branch equivalent, in each region. It's a good collegial working group, and we evaluate across the regions.

CHAIRMAN SKILLMAN: Let me ask this. Dick Skillman. Is there an inspection module chapter in draft or in final that attempts to distinguish between a plant, such as Oyster Creek, that may be choosing to serve halfway through it's PEO perhaps or capital upgrade cost reasons or, for the utilities, it's just too expensive to run versus a Kewaunee scenario where the decision has been made to cease operation with a very healthy plant, but the economics in the region caused the utility to choose to not continue? I see those as two related but very different scenarios, and I'm wondering if you have an inspection module chapter that tries to see those differences and inspect?

It kind of gets to Sam's question. If you're going to go halfway through the PEO, and you've made decisions and commitments that are required to enter the PEO and you haven't done it and you don't intend to do it now because you're not going to get the full benefit because you're not going to operate the full 20 years, it seems that that's a different lens through which to inspect. So my question is is there a IMC chapter on development that really looks at that?

MR. POWELL: I can tell you with certainty that that feedback has been provided to the program office. I cannot tell you the status of the manual chapter or any inspection procedure, however. We do have a manual chapter of 351 that does talk to plants and extended shutdowns for non-plant performance reasons, and I think that will be some of the framework that's used to develop the programs you're referring to.

CHAIRMAN SKILLMAN: Thank you.

MR. ROBERTS: I'd like to add, though, that, while there isn't a specific manual -- I'm Darrell Roberts. I'm sorry.

CHAIRMAN SKILLMAN: We can hear you.

MR. ROBERTS: While there isn't a manual

chapter currently in existence, one of the things that we do do is there are certain specific parameters that we look at during our normal baseline inspection program. In fact, the exercises that Bill indicated at Vermont Yankee a year or two ago when there was a lot of question and uncertainty about their future, and there were specific parameters we looked at, you know: maintenance backlog, are PMs being deferred, you know, are there capital projects that are being canceled or delayed or are things being switched around in outages, staffing issues?

So while there isn't a specific manual chapter, at least currently, you know, in recognition of that, the region took on a more focused assessment, if you will, at Vermont Yankee. And we intend to do the same thing with Oyster Creek or any other plant that has a question mark surrounding its future performance.

Now, if the licensee tells us it's too expensive to run a plant, then that presents a different issue, and we would be asking a lot more questions, I would believe, than we currently are. So we haven't got that indication yet from any of our licensees.

CHAIRMAN SKILLMAN: Thank you.

MR. ROBERTS: Yes.

MR. POWELL: Thank you for your time.

MR. TRAPP: I think I'm next up to -- can you hear me? Is the mike working? Closer? Are we good? Okay. My name is Jim Trapp, and I'm the Branch Chief for the Engineering Branch 3, and we do material ISI and we do some license renewal. And I'm here to talk to you today about a fascinating subject for the region. It's ASR.

And I'll share with you I've only been assigned to this project for a year. And a year ago, when I was assigned to the project, they said, you know, Seabrook, in the last 25 - 30 years, the concrete at Seabrook, they have some micro-cracking that's grown all the way to a millimeter in size. And I said, boy, this is going to be, this is going to be one exciting project to go up there and watch micro-cracking of ASR into Seabrook.

And I will tell you I've been in the business for a long time, 25 years with the NRC, and this is probably the most fascinating subject and project that I've had the opportunity, you know, to be involved with. So, hopefully, I'll convey over the next 20 minutes or so some of the real high

points of that project.

And I will share with you I'm a nuclear engineer by profession. We put together a task force, and it was an NRC-wide task force. We had people from NRO, license renewal, research. I mean, the whole agency is kind of focused on this issue, and we had a whole bunch of folks that know a lot about concrete. Chris Strondry is one of the fellows sitting over in the corner there. He's had a lifetime of experience with concrete. He was part of our organization, as with George Thomas, Bill Cook -- I could go on and on -- Angie Burford. All these folks supported this effort.

So with that said, I'm going to run through a few things. I'm going to run through what ASR is, what it's all about. I'm going to talk to you a little bit about our response, the NRC response to the issue, and talk to you, and this will probably be the most fascinating part is future activities. And there's a lot of future activities left to be done over the next couple of years.

Indications of ASR. ASR, as has been identified, localized areas of Seabrook concrete structures. And what ASR really is, what causes it is it's reactive aggregate. So it's the silica in

the aggregate that was used at Seabrook that is the culprit that's causing ASR. If you look nationwide, we haven't identified any ASR in any other plants in the United States yet, and there is a couple of plants overseas. There's one in Canada, and there's one in Belgium that they believe they have some ASR. So Tihange-2 in Belgium and Gentily-2 in Canada have both experienced some reported ASR. Gentily is closed recently for economic reasons, not because of ASR reasons.

So at Seabrook, there's 131 locations identified that have some sort of ASR, and that's throughout all the structures at the plant. Twenty-six of those locations have what we call combined crack index, and I'm going to pass a couple of things around.

But the first thing, because we've got to be on common terminology here, is combined crack index, basically, what it is is they have a person that every six months or every thirty months, depending on how severe the ASR is, they go in, and I'm going to send a picture around here, but they basically measure the width of the cracks, both in the vertical direction and the horizontal direction along lines.

And you'll see ABCs on this picture I'm going to send around, and someone actually goes in and measures the width of every crack that's crossing a horizontal or vertical line, and they add all those up and then they come up with what we call the combined crack index. It's combined because it's vertical and horizontal. And you'll see the number of crack index are recorded with units of millimeters per meter. So if you combine all the cracks up, you're measuring the number of millimeters of crack per meter of circumference or of the grid here.

So I'll pass this around. It will give you a good idea of what that's all about.

MEMBER ARMIJO: A quick question.

MR. TRAPP: Sure.

MEMBER ARMIJO: These measurements are made on surface cracks.

MR. TRAPP: Exactly.

MEMBER ARMIJO: And is there a general agreement that they're representative of what's going on internal to the concrete, as, internally, you don't have exactly the same environment? I'd just like to have an idea that they're representative of the wall structure.

MR. TRAPP: And some of that -- and we'll work through that when we get through the presentation. But some of that is still to be determined, I would say. You know, there's a theory, there's a lot of theories out there, and some of these theories are going to be put to rest when the testing, and the University of Texas has an extensive two-year project to do a lot of testing of ASR on large concrete beams.

You know, specifically, your question is what we're seeing at CCI is the surface concrete strain, right? So it's the strain that's caused by the ASR expansion in the wall. It's straining the rebar. Most of the walls that we're dealing with at Seabrook, other than containment, basically have a rebar on the interior of the wall, rebar on the exterior of the wall. There's about two to three inches of cover concrete, and what we believe is the ASR is actually spanning throughout the wall and it's causing the rebar to bow and that's manifesting itself with strain on the surface. And so the CCI index is really measuring just sort of strain caused by that expansion.

MEMBER BANERJEE: What's the scale?

MR. TRAPP: What you're looking at there

is a 30 inches by 20 inches. And that's the grid that they use when they do the CCI index. But, of course, since the units are millimeters per meter, it could be reflective of any part of the wall. I will tell you that what you're seeing there, that little 30 by 20, is what you'll see if you're at Seabrook. So it's very localized. It's not throughout the entire wall in most of the areas.

ASRs are a chemical reaction to concrete that occurs over time in the presence of water, alkali cement, and silica. You'll see some theories out there that it's the ground water that's causing ASR at Seabrook. You know, there's areas at Seabrook that aren't seeing ground water. They're above grade. Humidity can cause ASR. It doesn't take a lot of moisture to cause ASR to occur.

So, you know, certainly any external structures, if you look at the concrete structure around the CST, you know, that has a lot of ASR that's very visible, and that's just the rain water. There's a thought that cycles of getting wet and then drying is really conducive to promoting ASR, but I would say a lot of this is still in the theory stage, you know, and a lot of this theory is what I think we're going to learn when we go and complete

the project that NextEra is working on at the University of Texas.

And then, finally, the SR forms a gel. The gel is expansive and causes micro-cracks that affect concrete material properties.

One of the interesting things is the gel is probably not linear. There's a lot of gaps, a lot of concrete, and so the theory is that the gaps would fill up with the ASR gel first and then you'd see some sort of acceleration. So what we're seeing at Seabrook, you know, 25 to 30-year-old structures, you know, it might be not linear. You know, we might be seeing more expansion.

And, in fact, they are, you know, on a six-month basis, the worst locations, 26 worst locations, they are measuring those on a six-month basis. We've got two sets of measurements in. You know, it does look like ASR is causing some expansion based on those measurements. There's 72 areas that the CCI index is 0.5, so it's half as much as the 26 areas, and they're measuring those on a 30-month frequency. And, you know, I think when more data comes in, we'll have some good information on the rate of expansion.

One of the problems is, you know, they

do them in June and they do them in December, and so there's some thermal effects. And those thermal effects on the crack widths aren't really well understood yet.

MEMBER CORRADINI: So maybe you said it but I missed it. So what is it in terms of -- so you said there's three compliments. There's the presence of the silica, the presence of moisture, and the presence of the alkali cement, so it must be something to do with the alkalinity of the cement versus a plant somewhere else. So has that even gotten to the point that you have some sort of what I'll call equivalent pH measurement that if your --

MR. TRAPP: Sure.

MEMBER CORRADINI: -- if your number is 8 or 9, you're okay. But now you get to 10 or 11, and, goodness gracious, things are going south, or what?

MR. TRAPP: Yes, and that's interesting. The really dominant thing, again, goes back to the silica in the aggregate. Concrete is extremely alkaline. There's tons of alkaline in concrete. In fact, at Seabrook, because the quarries were all closed in the winter, so they backfilled. Instead of backfilling the structures with dirt, they

backfilled the structures with more concrete. So there's enough alkali in the structures at concrete to keep the alkali level extremely high for an extremely long period of time.

So alkali is not a controlling element. Water, like I said, the humidity, almost any water at all, there's a lot of water in cement, is enough to cause the alkali-silica reaction. So the only thing that's really dominating and causing the reaction is the silica.

And then with ASR, you know, depending on transport of the alkali and the silica, you can get changes in rate. For instance, the structures that they fabricated down in Texas this winter, the ASR didn't grow very fast. One reason is because of temperature, and the other thing is humidity. And they actually put them in tents. They have little sprinklers on them, and they're trying to sprinkle the beams periodically to get the drying and the wetting cycles to try to get the ASR to grow faster. We'll get into some of that when we talk about Texas.

But, you know, the key is is the transport of the alkali and the silica, getting those two elements, you know, getting those two

things together. That dominates the rate, but the key is is the silica. It has to be reactive silica.

MEMBER CORRADINI: So two aspects. So, one, the aggregate has got silica mixed all through it anyway, so I guess I'm a little bit -- you told us the scale that we're looking at is what here?

MR. TRAPP: Twenty inches by thirty inches.

MEMBER CORRADINI: Okay.

MR. TRAPP: And that's a picture of the wall. Now, you know, aggregate, it depends on where your quarry is. So some aggregate that you get is fine. Some aggregate you get is very, it's not fine. In fact, the beams they're fabricating, they're pulling some aggregate from a quarry in Maine, which is where Seabrook's aggregate came from, the reactive silica, and they're also getting aggregate that's super highly reactive from New Mexico, and they're mixing those two aggregates together to make the test beams.

MEMBER CORRADINI: So maybe you said this, too. Are we looking -- Sam may have asked it differently. So we're looking at surfaces for sure, but are we looking inside the plant or outside the

plant? I'm interested in weathering. In other words, does temperature change enter into this? So are we mainly looking at stuff on the outside or stuff on the inside where the thermal trend is much less?

MR. TRAPP: We're looking at everything. And everything, because of the silica in the aggregate, and they use the same quarry for all the aggregate, almost every structure has some sort of ASR. If it doesn't, it probably --

MEMBER CORRADINI: In and out?

MR. TRAPP: In and out.

MEMBER CORRADINI: Okay.

MEMBER BANERJEE: So when you say reactive silica, is there a particular impurity that does this, or do people know that, the silica?

MR. TRAPP: The key is, do people know it, it wasn't really well understood, I would say. And the ASTM standards didn't require you to do things like mortar-bar testing and prism testing that would identify the reactive aggregate. So the difference now is that there's tests that you can do. And, basically, you're grinding up your aggregate. You're throwing in a bunch of sodium hydroxide, and then you can measure the expansion of

that aggregate and the reactivity before you'd even put it in the concrete.

MEMBER BANERJEE: But do you know if there's a particular impurity or grain structure? What is it that does this, that makes it happen?

MR. TRAPP: Your probably --

MEMBER BANERJEE: I mean, you grind it up, put in the sodium hydroxide. Do you know why?

MR. TRAPP: I would answer this that the chemists know why, Jim Trapp doesn't know why. So the people who understand the chemistry, and it's a complex chemistry, could put up the equations and tell you exactly why that --

MEMBER BANERJEE: You can actually characterize the silica before it --

MR. TRAPP: Correct.

MEMBER BANERJEE: -- what the chemistry was?

MR. TRAPP: Yes. And there's other mitigators. You could throw a fly ash in your mix, and the fly ash somehow disrupts the chemistry, and that's a fix for not getting ASRs is you put fly ash in the mix. In fact, a professor in Texas, because Texas has a lot of ASR, when he built his foundation he put fly ash in his mix so he wouldn't get ASRs.

It's a simple cheap fix.

MEMBER ARMIJO: Jim, we have a lot of people interested in materials.

MR. TRAPP: Oh.

MEMBER ARMIJO: But, anyway, just for perspective, a number of structures have probably been built, non-nuclear, with silica. Has there been any major degradation or structural failure in like, say, an other type of structure? How bad can it get?

MR. TRAPP: And I'll throw this out there because I've thrown it out before, but I haven't thrown it out in public yet. Since, you know, they started building concrete structures back in the Roman times, to our understanding, there's never been a structure that has failed due to ASR since Roman times to the present. So there's not a lot of them.

There is things that happen, and people will point to them. There's bridges that have been replaced. There's a large problem with infrastructure in Texas and Virginia and other states where the vents, the parts of the bridge, you know, you'll see some ASR. In fact, I jog along the Schuylkill River at lunchtime, and the bridge down

there I'm pretty sure has a little bit of ASR infecting its bridge vents.

So it's out there. And the other thing is if you don't reinforce with rebar, things like airport runways, you know, because the ASR will occur and then you'll get some fractures and that gets sucked up into the engine. So there's been some replacements of those types of structures.

MEMBER SCHULTZ: Okay. I understand. I would like to hear more about the investigations ongoing associated with the causality of the process. But with regard to your last bullet on concrete material properties and the degradation associated with that, how much testing is being done specifically on the situation at Seabrook to determine that aspect?

MR. TRAPP: And there's a lot, and that's my future activities. I've got a lot of slides that I'm going to run through with what's going on down in Texas and why they're doing it, so I think we can just maybe hold off on that question and, at the end, I'll certainly come back to it if I didn't adequately answer it.

One of the big focuses for the NRC was the operability of those structures. You know, this

is the first time we've seen this, if the structural is operable or not.

And I just want to run through that we've done extensive inspections review. The licensee has actually recalculated for all their ASR-affected structures, and, basically, what they've done is they've taken worst-case material properties for shear, for compressive stress based on industry known testing, not Seabrook specific but industry known testing. They've taken the worst case of that data. They've applied it to their calculations, and they've shown that their capacities are acceptable. And that doesn't mean that, with all the safety factors, that they would meet all the ACI. It means that, you know, the structures aren't going to fail under design loads. So there's still plenty of work to do before they get their complete operability of evaluations.

Next slide. And at this point, I'm going to pass out some samples. There's a lot of NGOs in the area that they'll refer to Seabrook walls and Seabrook concrete as mushy. We've brought you a piece of, allegedly, mushy concrete, and you can pound on it. If you look closely, the aggregate, you'll see small cracks with white gel

coming out of them. You'll need your glasses. That's ASR.

And you can see, actually, the coating. So they took a chunk of the wall and a slice of the wall. This is a chunk of the wall. This is from the RHR core spray balls. And if you look closely, you know, this is actually a chunk of Seabrook and you'll be able to see some ASR.

This is actually, interesting enough, you know, I'll leave you, for your determination, I'll pass this around, as well, but that's referred to as moderate to severe ASR. So this is the real bad one, and it looks much like counter tops, you know, marble counter tops that you spend a lot of money for. It's pretty solid.

And this one is part of the containment enclosure building. Seabrook actually has almost like a double containment. They have an enclosure building around their containment, and this is a slice for petrograph where they actually can go in and measure damage rating indexes. If you hold it up to the light, you're going to be able to see aggregate, some sand, and you can see a little bit of the ASR. This is mild ASR.

We ran through this a little bit through

the Q&A, but, again, this is sort of where you're going to see ASR. And I think the examples that I provided you, you'll get a better look at what it looks like.

Next up, I'd like to run into NRC actions. We've issued an information notice back in 2011. And, again, you know, the purpose of that was for other plants to go out and look to see if they had ASR, and we haven't had any feedback that they have.

We issued a confirmatory action letter to the licensee, NextEra, and we captured 11 commitments in the CAL. And, really, back in 2012, when we issued the CAL, you know, the program for how they were going to address ASR was not well developed, and so the commitments in the CAL were really to set up the process, set up the program, and develop a plan to address this issue.

Most of those commitments or all those commitments have been reviewed by the NRC in two inspections, one that was just completed recently. And the licensee has met all of those commitments.

Ray talked a little bit about the ROP. This took a lot of inspection, well beyond what is allotted for Seabrook, so we went to the EEO and we

got permission for an extra one to two FTE to just monitor Seabrook ASR, and that was granted. We had a task force charter. Again, we had to ensure departmental interoffice support for our charter, and we put together a great team of experts and have done a lot of inspection and oversight.

The interest in the Seabrook area for nuclear power and this issue particularly is extremely high. I probably get emails from NGOs, I'd say, every other day on some question on Seabrook ASR. And so we've held two public meetings, and we have the plans to conduct a third. And they were well attended public meetings. Well over a hundred people came to spend an evening with us talking about ASR.

So we've done some press webinars, and we've put together a pretty extensive public website that has been well received. It's actually linked right off of the main NRC public website. You can click on Seabrook ASR and get everything that's public regarding that, and that's been well received by the public.

MEMBER BANERJEE: Why is there so much interest? Is it because there's a lot of loss of strength or --

MR. TRAPP: No. In fact, there's not a lot of loss of strength, and we'll get in that. But I think there's a perception out there that this might be the Achilles' heel for Seabrook, you know, that you have something that's ongoing that can't be remedied. And there's a perception there's a serious safety issue, you know. Certainly, in their belief, there's a serious safety issue, so there's a need to communicate. We reached a different conclusion based on our review of operability evaluations, and we need to communicate that to the local public. And then I think there's a thought that ASR would be the one thing that Seabrook couldn't recover from.

MEMBER BANERJEE: But there's testing going on of material with ASR?

MR. TRAPP: There's been a lot of testing, and there's going to be some specific testing of Seabrook structures. And I'm going to get there. I'm going to get there.

And I'll run through this pretty quickly. Future activities. We've completed both our CAL inspections and, with management approval, we're going to propose anyway to close the CAL and close the memo. And I want to emphasize, I

can't emphasize this enough. The CAL was to set up the plan, so we're not done with this issue. This issue is probably going to go into I know 2015, maybe 2016. But the level of effort that we've applied to this point is adequate to show operability and that the program in place to resolve the issue is technically sound.

We are going to conduct a third public meeting in the October time frame. And we're going to continue to do a lot of ASR oversight, and this would both be at the University of Texas-Austin, which is Ferguson Structural Engineering Laboratory, and I'll show you some pictures of what's going on down there.

And we're also going to continue to monitor and provide oversight at Seabrook on the ongoing activities to make sure that the, you know, ASR at the site is progressing, as anticipated.

And this will be the fun part. I think this is the part you guys will like. This is the testing at Austin. This is a multi-million dollar project that NextEra is undertaking. And the first question is kind of, well, why are they doing it? There's a lot of ASR studies that have been done on triaxially reinforced concrete beams. So if you

have rebar in all three directions, you know, if all Seabrook structures were rebar on the inside, rebar on the outside, and lots of cross rebar in the triaxial direction, there's probably enough research out there that Seabrook wouldn't have to undertake this project.

I think those type of triaxially reinforced beams, that research has been done. In fact, it's been done at the University of Texas, and I think those structures would be pretty well understood.

And I will throw out sort of an interesting nuance about these structures. As you can sense, when you expand the structure, when you expand the concrete, you're putting stress on the rebar. And one of the things that structural engineers do is they re-stress rebar to make their structures stronger, so some of the things that you find with ASR, you know, at reasonable levels of ASR is these structures, when you do the mean tests, become stronger and not weaker. So it's kind of counterintuitive, you know. Certainly, it's not the end-all. You know, we joke at one time, well, everybody should get some ASR aggregate so they can make their structure stronger, but there certainly will be some level of ASR where that's going to

reverse itself.

And that's really the crux of what they're going to do at Seabrook is they're going to build large-scale beams, and they're going to do large-scale beam testing, and they're going to put enough ASR in these beams, hopefully, to start to show the asymptote and where the ASR starts to affect structural integrity.

So that's the why. And, again, it's important because some of the structures at Seabrook which has the rebar on the inside and rebar on the outside, those structures haven't been tested. So, you know, time will tell whether those structures behave as tracks or reinforced structures.

The testing is scheduled to be completed by 2015. It's being done with similar aggregate to what's used at Seabrook. Again, since they want to induce the ASR in terms of, you know, months versus 25 years, they couldn't use all the same aggregate and all the same concrete that they used at Seabrook, or we would be waiting 25 years for the results. So there is some differences, and that's important to age the beams.

They have extensive oversight down at the University of Texas. They've hired MPR, and

that's sort of their quality assurance folks. It's kind of funny. We were down there doing an inspection, and it's probably the only time in anyone's lifetime that you would see those ten PhD students and maybe five PhD candidates all mixing concrete in a concrete truck. So these folks are getting some hands-on experience, but it was kind of fun to watch.

So they're very highly-qualified folks. You know, this batch of concrete is probably the most precise batch of concrete that's ever been mixed in America with all these folks down there doing it.

And what would be the outcome? The outcome of the project might be, and, again, we're conjecturing a little bit, but, you know, the relationships in the ACI code are really no longer valid. So, you know, the way you would design a structure is you would measure the compressive stress, you would stick it into a square-root formula, and you're going to come out with a shear, and that shear you would put into your calculation.

Well, with ASR, you know, is that calculation still valid? Maybe not. So the test will tell us whether it is and, if not, what's the

correction factor.

And so the ultimate outcome of this would be, likely, a 5059 review, that we're using a new methodology that isn't previously approved by the FSAR. And then there would likely be a license amendment. So, again, we're waiting on the testing, but all this review might not be over until the NRC would approve the methodology. And we're thinking that's all going to be done, kind of done on the back-end.

The three tests that they're doing. Anchor bolt testing. And this, you know, nuclear power plants, to hold up the cable trays and all, there's a lot of Hilti bolts. There's a question out there, well, will there be bolts that have a bunch of ASR around them? Are they just going to pull out of the wall? They've done some testing. They had some, they call them the bone yard beam, so they had some high-stress concrete beams from the transportation industry that they drilled holes in, put these in, pulled out. They had very high levels of ASR, and they didn't experience any degradation in that aspect of the test.

But they are growing additional beams, and they're doing a lot of, they're going to be

doing a lot of testing. They've already, basically, tested the control beams, and they're now trying to grow the ASR. And, again, they had a lot of problems with that this summer. This winter, it really didn't grow as expeditiously as they expected.

And one of the interesting things here is that a lot of people are complaining, well, you're not testing Seabrook concrete. The nuance here is you're developing concrete. You're developing a control. You're testing the control, and then they're going to test, say, three levels of ASR, 2 CCI, 4 CCI, and 6 CCI. And so you're going to compare all of your results back to the control beam.

So the real validity of not being concrete at Seabrook probably isn't all that important because, much like when you design any other structure, you're always relating it back to, you know, back to some sort of control. And I know we've had a lot of discussions with the NGOs in the area, why aren't you just testing concrete at Seabrook?

So that's the test program. That's the first one is to do the Hilti bolts, lap-splices, and

containment. They do cadweld, so all the rebars are cadwelded together, so lap-splices are not an issue.

What the concern is is, basically, in the walls, all the other walls at Seabrook, they just basically lay one rebar next to another rebar, and then they pour concrete around it. And there's really nothing, there's no cadweld, there's really nothing -- the strains between the two rebars are really, are really transferred from the concrete. So there's a thought out there and there's some experience based on small-scale models that, you know, the ASR could then cause that lap-splice to be less strong and that could be a failure mode. So one of the test programs that they'll be doing is they'll be doing, they have a bunch of lap-splices in a large-scale beam, and they'll be doing testing and to see if those lap-splices behave differently with ASR than with non-ASR.

And the third test program that they'll be doing is with shear. Again, that's a real concern with ASR. We tend to know how concrete with ASR behaves from a compressive point of view, but there's still a question out there for Seabrook structures on shear.

So the three test programs really are

the anchor bolt testing, the lap-splice testing, shear testing, and then they're fabricating three additional beams that they'll use for potential remediation. So if any of these beams show significant degradation, the thought is is that they'd be able to put in some sort of lateral reinforcement, drill holes and put in lateral reinforcement, and then they would go back and test those structures to see how they behave with high levels of ASR. So there is a strategy out there for remediation if the results that they have aren't favorable.

Next slide. And so I'm just -- basically, these are some slides and some pictures of what goes on. This is the lap-splice performance. And to put this in perspective, these beams that they're growing and building are about 30 feet in length, 4 feet depth, and 3 feet wide. So these are significant beams.

And, you know, there is a lot of testing of small-scale beams, but it really doesn't, you know, you're not really getting good results if you don't test large beams. And that's been pretty well proven through other test programs.

Next slide. Again, this is a picture.

This is an old beam that they fabricated. This would be, again, a structure for transportation, and they're doing a lap-splice test on that beam. Again, it's sort of a massive facility, and this is down at the University of Texas.

Again, the next slide now is just a depiction of a shear slice. And, you know, you expect the shear slice to give you a diagonal break, and the next slide with a picture will show you that's a typical shear test and result. You can see on the right-hand side that they sheared that. They should be able to get two shears out of each one of the beams that they're fabricating.

And that's kind of ASR in a nutshell. This is a subject that my peers and I talk about for days and hours and weeks at a time. To try to do that in 15 minutes or whatever I had here was a challenge. MEMBER BLEY: Could you clarify for me my old memories and what's going on here? The rules of thumb, I've always heard, is the strength comes from the steel and all concrete has cracks. Now, this is more smaller localized cracking and it does the growth; is that the big difference?

MR. TRAPP: I think the big difference

is the growth. And you're right. You know, you go to containment, and when they do the containment over pressure tests during initial construction, you're sitting there and you watch the cracks grow.

And then I will share with you, when I walk around containment, not being an expert in ASR, it's like, well, why is that not ASR and why is this ASR? And from this untrained eye, I can't really tell you. You will see, and what you will see is some of the gel. You'll see a blackened gel come out of the ASR. But it's really that it's not static, it's dynamic. You know, those cracks in the beginning and any other cracks that are in containment you would expect to stay static, where this is dynamic. And so how is it going to behave for the next, you know, if we're talking license renewal and how is it going to behave for the next 20?

And I think it is reasonable to assume that, at some point, you know, your pre-stressing the rebar isn't going to work to your advantage anymore, and you're going to have some issues. And then that's been demonstrated. You know, lap-splices at very high level of ASR, they're going to

pull apart.

MEMBER ARMIJO: Sam Armijo. A quick question. The program, as laid out, as you've described it, looks very complete. But how do you accelerate the rate of growth of the gel? You know, try and get 20 years of life in a one-year test? Is one way you can accelerate the kinetics is, typically, by somewhat higher temperatures.

MR. TRAPP: Right.

MEMBER ARMIJO: Is any of that going on as part of the program?

MR. TRAPP: Yes. And it's really, and I just touched on it and, again, I wasn't very thorough. I would like more time to talk to you about this because I love this subject. But the three ways they're accelerating it is that all the beams are put in a hot house, so the temperature they're trying to maintain, and they're thinking about putting heaters in there next winter because they're claiming, you know, a winter in Texas, they said it was the coldest winter in Texas, so that's one of the excuses why the ASR is not growing. And then the other thing is they put the sprinklers in there, so they're trying this heated wet, you know, the dry and wetted cycles. So those are two things

they're doing for the kinetics.

And the other thing they're doing in the fabrication is they're finding aggregate that is known to be super reactive. So they're going, you know, nationwide. This aggregate that they got out of New Mexico is like the most, the worst aggregate for ASR. And so when they fabricate the beams, you know, they're making sure that the aggregate looks a lot like what's coming out of the quarries up in Maine because you don't want the aggregate to influence the outcome of the results.

So what they've shown is, you know, is it's the shape and size of the aggregate more than the aggregate itself that's causing, you know -- using similar aggregate would be acceptable, and they're using the most reactive. And they also throw in a little bit of sodium hydroxide to give you a little boost with the alkaline. So those are the things that they're doing to try to accelerate it.

And, you know, this is kind of a known science. They've grown beams before, and they've been successful.

MEMBER BANERJEE: So you say shape and size. How does that affect the kinetics? The

surface area or what?

MR. TRAPP: Again, you're a little beyond my knowledge base, but I believe that to be the case. You know, if you have very large aggregate, the beam would -- completely different than what's at Seabrook. I guess it's logical that that cracking would be a little bit different and, you know, your performance of your beams would be a little different than, you know, a similar size. And, again, a lot of it is optics, so they're trying to, they're trying to make these beams as close to Seabrook because it's just an engineering and technical reasonable thing to do.

MEMBER BANERJEE: And you say temperatures. There's some evidence that there is sort of a kinetics --

MR. TRAPP: Yes. And, basically, they believe that's because of the transport of the two, the silica and the alkali, that, with higher temperatures, you get better interaction between those two.

MEMBER BANERJEE: The reaction kinetics or the diffusion?

MR. TRAPP: I know I'm on the record, and I think you're beyond me. I think it's the

diffusion, but I'm sure if I say it's the diffusion then somebody will come back and say, no, it's the reaction. But I believe it's the diffusion.

MEMBER ARMIJO: Well, it depends on where the reaction occurs, whether it's at the interface with a -- well, anyway, I won't belabor your point. You're addressing the issue of temperature and the kinetics of the reaction so that you can say that, yes, we've duplicated, what happens in 20 years we've duplicated with experiments in a couple of years.

MR. TRAPP: Right.

MEMBER ARMIJO: So that's a key point.

MR. TRAPP: Right.

MEMBER SCHULTZ: Jim, I appreciate the experimental testing approaches that have been described here, but, still, we'll have the question that has been raised by the public about, well, what about at Seabrook? And I'm wondering whether I'm expecting that the condition that's been described for Seabrook 1 may also be apparent in Unit 2. A lot of concrete was poured there, and I'm wondering if that's been explored and whether there's any testing that might be done on-site on the concrete structures that have been at least partially

constructed at Unit 2 that could answer some of the questions that the public and we both have.

MR. TRAPP: And we get that question at every public meeting and multiple times. The answer to your question is, no, there is no testing going on at Seabrook Unit 2. And there are a couple of reasons for that, maybe some that are technically sound, some that may be less so. One of them is it's just too hard. The other thing that probably at least resonates better with me is, you know, the way that you monitor structures is, like all structures, is you build these beams, you test them, and that's how the ACI code works. That's how the current structures are designed.

The levels of ASR in Unit 2 are low. They're much like what we saw here. So testing those structures probably isn't going to tell you anything. You're going to have to wait, you know, many, many more years to get to the level of ASR that you're probably going to see structural changes, and the only way you're going to do that is to accelerate the ASR and test these beams.

So I think there's a practical element here that you just, you know, I mean, the ACI code says you can go do an in situ test on the wall and

you're good to go. I'm not sure there's any in situ test that the NRC would just back off and say, you know what, we pushed on the wall, it didn't break, and that's good enough, you know, we're done.

And then the other thing is there was a question, you know, the real relation is how do you make sure with the ASR with a CCI on these beams is similar to what you're seeing in the walls at Seabrook? That's the question that our team really has been challenged with. And they are going to take the samples. They're going to slice that. They're going to do damage rating indexes. There's a whole bunch of damage rating indexes, and they're going to have to show explicitly that, hey, our beam looks like our wall at Seabrook. And that's part of the plan.

So I think there will be a high level of confidence that the beam looks like the wall and that the tests are, you know . . .

MEMBER SCHULTZ: That second part of the process that you describe is what I would also like to get to, and that is remembering when Seabrook was designed, when it was constructed. It was an extremely robust design in the first place, and there was substantial, I believe, both design and

construction margin applied to the Seabrook site. And I'm wondering how much of that evaluation is also being done going back into the, again, the design and construction of that facility, in terms of making a determination of an impact on plant life.

MR. TRAPP: Yes, you're exactly correct. I'll give you one example. The lap-splices which are designed for three feet of overlap, at Seabrook they have six feet of overlap. You know, if they wanted to, the extent of saying, you know, we're going to check every rebar splice and make sure they're all six foot, they haven't done that. They said, "You know what? Three foot is our design. We're going with three foot. You know we put in six foot, but, unless it necessary, we'll go back." And you're right. So there's design margin there that they haven't tapped yet.

MEMBER RAY: Jim, this is Harold Ray. Your work is terrific, and it sounds like the licensee's is, as well. I'm wondering how this is, you referred, at one point, to a team. To what extent is the headquarters and the people who normally lead the ACRS looked to for research so that the Agency can capture and carry forward

whatever lessons there are here? Can you speak to that for a minute?

MR. TRAPP: Yes. And, in fact, you know, the team approach to this was perfect, and research is part of our team. I recently reviewed a new way that they're trying to come up with techniques. They're trying to go out for research with techniques to detect ASR in the walls. You know, there's really no good UT or any way you can work something on concrete. So that's part of it.

So research has really been intimately involved. And I would say not only nationally but internationally. There's been a lot of calls with Canada. We had a presentation by the Belgians with Tihange. So they're kind of all over this issue.

CHAIRMAN SKILLMAN: Colleagues, are there any further questions for Jim? Jim, thank you very much. I would like to call a recess of 15 minutes. Thank you.

(Whereupon, the above-entitled matter went off the record at 10:00 a.m. and resumed at 10:15 a.m.)

CHAIRMAN SKILLMAN: Thank you for returning to your seats. The meeting will now come to order, and I turn the meeting over to?

MR. GRAY: Mel Gray.

CHAIRMAN SKILLMAN: Mel Gray. Mel, proceed, please.

MR. GRAY: We want to take a minute here. We had some interest in Oyster Creek and their dry well inspections that they committed to. We have some information, if we could trickle back for a minute on that. I'll introduce Amar Patel. He's the resident inspector at Oyster Creek, so he wanted to impart some information.

MR. PATEL: I'm Amar Patel, resident inspector at Oyster Creek. I just wanted to clarify that the dry well inspections are not only in their aging management program, but it's also in the license commission and the tech specs that we would do a dry well inspection every other one.

CHAIRMAN SKILLMAN: Okay.

MR. CAHILL: Okay. My name is Chris Cahill. I'm a senior reactor analyst here in the region. And by looking at the crowd, it doesn't look like anyone is as interested in flooding as they were in ASR. I don't have any material handouts, so we'll just go from there. So we're going to go over the status of the employment side of it and walk over employment for Region 1.

Okay. So in the region, we did Tab 187 and 188 in response to the Fukushima waters. We were evaluating the licensee's walkdowns for seismic and external flooding.

Flooding here in the region, predominantly, we're mostly coastal here, coastal plants, so the flooding is really driven a lot by the hurricanes. So we don't tend to see the large dam failures like you might see in some of the other plants, although dam failures may contribute a little bit with large precipitation and things like that, like a hurricane.

So we performed the walkdowns at all the sites, and all the walkdowns were completed and documents in the fourth quarter reports around January. So we got those knocked off pretty quick.

There were some issues that were identified. The first one was identified at Millstone. It was identified by the licensee. They identified some unsealed penetration openings. Those are still in the inspection arena now, but they're identified as unresolved items, so we're still evaluating that for regulatory compliance, and inspection activities are still undergoing.

The next two, and this is sort of a teaser for the next presentation by Justin Heinly, were identified at Three Mile Island. Two issues were identified. The first is a violation for missing penetration seals in their intake and screenhouse. And the second one was for significant numbers of missing penetration conduit seals that went from the area pump into the building.

I'd just like to say that this was an extraordinary effort by the residents. They did a great job finding these issues and drive to the ground. And as you understand, Three Mile Island, a nuclear power plant by a local river, flooding risks tend to be pretty significant there.

Also, in response to the TIs, there was a follow-up done, and these were performed to gain a better understanding of the licensee's methods and procedures done for the walkdowns and a system review for walkdown reports. Several factors were used in these audits. The first one was a lack of clarity to have the walkdown those are typically valued after over a review of the walkdown reports looking at some guidance on the review of the walkdown reports. Other issues included plant specific areas of interest identified during review

of the walkdown reports. Some of this was driven by if the licensee relied on actions, for example, sandbagging as a major flood mitigation feature. There was more of an interest of looking at those, the adequacy of issues like that. And also just from feedback from the staff that certain issues probably deserved a second look. So far in the region, we've had audits conducted at Salem unit 1 and 2. As far as our interest in the region, we've been participating or observing these audits because we have a knowledge of the site that can assist the team and also, just with our large stakeholder interest here, we'd like to see it performed as we can so that we can address any issues that come up in a timely manner. Salem Unit 1 and 2 and Hope Creek Unit 1, those studies have been performed. Vermont Yankee has been performed in the flooding arena. In the seismic arena going on this week, there's Beaver Valley and folks are out there this week doing those. These are still in progress. The site activities are done. George Wilson is the lead for this activity and his team that is running this is the same team that is running all the audits so they get a consistent response. And that concludes our writing prepared for this. I'll entertain any

questions if we have those at this time.

CHAIRMAN SKILLMAN: Colleagues, questions? Chris, thank you.

MR. CAHILL: Okay, great. Thank you.

MR. HEINLY: Can everybody hear me okay? All right. My name is Justin Heinly, the resident inspector at Three Mile Island. And the Senior Resident Inspector is also here, Dave Werkheiser. I'm here just to talk a little bit about the TI-187 inspection that we performed at Three Mile Island, both independent, as well as the accompanied walkdowns, and talk about two of the issues that we identified.

The first issue was on the independent walkdown where we identified 13 unsealed penetrations in the motor base plates. And then the second issue was during the accompanied walkdowns in the air intake tunnel where we identified 43 cable conduit seals that were not, that did not have their seals inside them.

At the bottom here, we do have referenced the official material that's been put out in the public domain, if you guys have any further questions and if you want to take a look at it.

So the first issue I'm going to talk

about, and this was during our independent walkdown, the licensee had already walked down this location so we were doing it after they had completed their walkdowns. So at TMI, they take suction off the Susquehanna River, so this is kind of a cross-sectional view of their intake screen and pumphouse. The flood-protected area is up where the green and purple diagrams are. That's both control centers, as well as the pumps themselves. Those are the safety-related connection to the ultimate heat sink for Three Mile Island.

On the right-hand side, we're trying to depict how the normal river water level was going all the way up through what the probable maximum flood was. So at the bottom, you can see the normal water level here going up to their initial actions for entry into their abnormal operating procedure, followed by an unusual event going to an alert at 302 elevation.

Second from the top here is actually the grade elevation, 305. And the highest one up there is actually 313.5, which is the probable maximum flood. This is their design basis flood that's put in their FSAR. Their design basis flood barrier system is actually 313.5, and that's what we were

doing a walkdown of.

So the flood barrier in the intake screen pumphouse is actually all four of these walls right here. So as the river water comes up, the base plate or the floor, rather, of the intake structure is part of the flood boundary for TMI.

So when we took a look at it, that was actually one of our focus areas. And we looked at the motor base plates to ensure that they had all their penetrations that were sealed. And lo and behold, we found 13 holes. This is about a quarter size, and these over here, this is actually the seal leak-off that was used for packing seal, and those actually went directly down. They communicated between the flood barrier area and where the river water would be. So river water actually had come up through those holes into the protected flood area.

So because the licensee had already done their walkdowns and we did it as an independent walkdown, we identified that it was a failure of the licensee to identify and correct, in accordance with Criterion 16, corrective actions. When we did the risk analysis, it came out as a green non-cited violation for that.

Second issue we talked about. This was

actually during our accompanied walkdown, so this is in, this is a cross-sectional view, actually, of TMI's flood barrier system. Again, we depicted on the side there river water levels as they go up through. It should be the same nomenclature as the prior slide.

Just to give you a brief view of all the different buildings, starting on the most right-hand side with the emergency diesel generator building housing the alpha and bravo diesel generators. Moving left is the air media building, which houses that green box there which is the emergency feedwater system. In the background is the reactor building. Next is the auxiliary and the fuel handling building, which houses their safety-related building spray and decay heat system. BW, so it's synonymous with RHR in Westinghouse terms.

And then what is unique to TMI is they have an air intake tunnel which is used as a safety-related supply of air going into their safety-related buildings, such as the aux and fuel handling building. This tunnel is used for design basis mitigation for specific only to TMI.

So when we did our walkdown, we actually did the walkdown inside the tunnel here. And what's

unique about the tunnel is that all of the cable vaults or, excuse me, all of the cables that come from the intake structure go through cable vaults in the yard and then enter into the air intake tunnel and continue on into the aux and fuel handling building. What's circled there is actually what's depicted here which are Crousse-Hinds couplings, which were supposed to be, during construction, filled with sealant material. So when we looked at them, this is what we saw. It looked as though there had been prior degradation on them from some sort of humid environment or wetting. When we took a look at it, the first flag was all the rust and the degradation on it. But the second thing was that there was holes on the bottom of them and there were drain lines there. So when we looked at it, we took a closer look at it and actually shown our flashlight up inside, and that's the area where the sealant material should have been and that the licensee staff was there and said, yes, that's where the material should be. When we shown our flashlight up in, we didn't see anything but cables or, in some cases, open conduits there.

So we provided the safety concern to them that there was reasonable doubt of the seal's

existence. So the licensee took it upon themselves to further investigate and actually bore-scoped it and confirmed that there was no sealant material in there. The extended condition was that there were 43 of these Crousse-Hinds couplings that didn't have their sealant material.

MEMBER RAY: You could visibly see all of them?

MR. HEINLY: So there was -- let me back up here. It's kind of hard to see, but they come in in banks. So one of the banks that we looked at actually had the drain lines open so that we could look inside. Based upon those observations, they, essentially, conservatively took the approach that all Crousse-Hinds couplings that were designed to have sealing in them did not.

So this is actually what we were looking at. This is kind of a design drawing. This is the drain well that we were looking up into and where the sealant material actually should have been. So the cables would have been pulled first, and then they would have put in a sealant material inside of there to prevent any water coming from the yard vaults, yard cable vaults through the conduits and entering into any safety-related structures.

So what we identified is that, back in 2010, the licensee actually did a comprehensive flood barrier system walkdown, and they had looked at these couplings and they didn't, they didn't question the integrity of the seals. And, also, the fact that we pointed it out to them during our inspection, we dispositioned it through the ROP as a Criterion 16 violation for corrective actions for the failure to identify.

The tricky part then became trying to quantify and understand the ingrained plant response, where the water would go, what systems that they had and would not have available during a probable maximum flood. So what you see here is that's myself, as well as headquarters SRA. We had substantial support between the resident staff, the headquarter staff, and our regional folks of being able to quantify and understand all this and what it means when a probable maximum flood would occur because, you know, in a probable maximum flood you would already be shut down based upon tech specs. So there's some unique aspects that needed to be worked through.

MEMBER SCHULTZ: So for clarity, the white finding was based on the fact that this was a

programmatic element in their corrective action program, pre-existing in the corrective action program, and so the completeness of that corrective action was what was questioned?

MR. HEINLY: They did a walkdown of their entire flood barrier system to actually create a design basis document. And during that walkdown, they looked at these. However, they didn't question the integrity of them, so they didn't identify it at that opportunity when they were there looking at them visually, like we did during the TI. So that was part of the basis as to why we identified that it was plant performance and that they should have been able to identify and they had a reasonable opportunity to do so.

MEMBER SCHULTZ: Thank you.

MR. HEINLY: So this is just kind of a summary slide here. The two issues that we identified was river intake. The things I want to point out are the corrective actions, so they permanently sealed the base plate holes in the intake, as well as they provided valves that can be shut off during a design basis flood that would be used during the preparation for that.

And then, in the air intake, they took

immediate comp actions. And then, furthermore, they did a permanent modification to seal the conduits upstream to make the flood barrier system whole.

We did also want to take the opportunity to share this both within our own region and then also throughout the entire NRC through our inspector newsletter. Any questions?

MEMBER ARMIJO: Yes, I have a quick question. In your picture on chart 40, what is that orange, is that a --

MR. HEINLY: On this slide here?

MEMBER ARMIJO: Yes. What is that?

MR. HEINLY: Are you looking at these guys right here?

MEMBER ARMIJO: Yes.

MR. HEINLY: Okay. So, yes, that was an interesting point of this whole scenario was that these are fire seals. They're not qualified for holding back flood water. However, through this investigation, the licensee did substantial testing on these fire seals to prove at least some sort of hold back for water so that, essentially, the water would kind of get stuck here for a certain amount of time, and some of them would blow through, others would be able to maintain the flood water.

MEMBER ARMIJO: My second question is related to vault entrance. You didn't find any problems with sealing in that vault entrance?

MR. HEINLY: So during the design basis flood, the grade on the entire site would be filled with water. So the conservative assumption would be that these vaults were not designed to be watertight. So the conservative assumption would then be that they would completely submerge. However, during normal plant operations, the expectation is that those cable vaults are dry, and we do do inspections on those.

MEMBER ARMIJO: Okay. But you haven't found any evidence that they've ever really had significant amounts of water for any reason in those cable vaults?

MR. HEINLY: Yes. In the past, there's actually been documented violations based upon submergence of cables. That's been addressed. They've taken substantial corrective actions on all of their yard cable vaults, and they do do routine preventive maintenance, as well as inspections, on them. And, to date, I can't, I don't think there's any cable vaults that have any submerged cables for safety-related or license renewal cables that we've

observed.

MEMBER ARMIJO: Okay. Thank you.

CHAIRMAN SKILLMAN: Justin, I have a question. It's on slide 41 regarding information sharing. I'm wondering if Exelon published this information in OE to INPO so that it is very widely shared among all licensees.

MR. HEINLY: Yes. I believe they put out what's called an NER that's used to disposition or, essentially, give the information throughout the industry.

CHAIRMAN SKILLMAN: Thank you. Colleagues, any further questions for Justin? Justin, thank you.

MR. HEINLY: Thank you.

CHAIRMAN SKILLMAN: Chris, I'm going to ask you, please, to move along as fast as you can. We can maybe catch up on time or at least leave time for --

MR. CAHILL: This should go by pretty quick. We participated and assisted in research in both the state of New York and a consequence analysis on the SOARCA and the spent fuel pool scoping study. And for the SOARCA analysis, we participated mainly in the mitigation that was used

or evaluated for the event, and this had to do with implementation of some of the B5B strategies. The most notable one was the lack of store and operation of the RCIC system during the SOARCA earthquake-evaluated events.

So it wasn't a PRA, per se. It was really they were looking at a mitigated versus unmitigated state. We assisted the research staff with evaluating the emergency operating procedures, SAMG guidance, other mitigating features, and doing tabletops and walkdowns, to be able to ensure research that the event was, the strategies were credible to be able to be evaluated with SOARCA for a mitigated condition. So that was the SOARCA.

MEMBER STETKAR: Chris?

MR. CAHILL: Yes, sir.

MEMBER STETKAR: Did you look at any of the other actions that are in that scenario for SOARCA? In particular, they look at shedding DC loads to extend their battery lives way out beyond the designed battery life. Did you look at any of that from a tabletop or confirmatory perspective with the site?

MR. CAHILL: We stepped through that, but the SOARCA procedures were looking for, like,

long-duration station blackouts. So we were either beyond battery depletion for the batteries or they were the failure of internal DC anyway just due to the assumed large event.

MEMBER STETKAR: Okay. I don't want to dwell on it. Thanks.

MR. CAHILL: With respect to the spent fuel pool scoping study, once again, we assisted research with this, and this was mainly with James Zhang of research. And this actually went into development of a human reliability study for some mitigation where the SOARCA analysis was really just is this credible to consider for a consequence analysis, where with the spent fuel scoping study actually assisted research in developing some probability of success in employing some of this equipment.

And with the spent fuel pool, although I used the term FLEX here, we're really looking at the specific B5B equipment that was available on site at the time since they were in the process of rolling out the FLEX. So at the time, we're considering the single pump that was available. But just for clarification, that's what we meant.

So we looked at the feasibility of the

site identifying that there was a leak, diagnosing and responding it, employing the B5B or the FLEX equipment, and either employing a direct injection or a spray, depending on what the rad levels anticipated on the refuel floor might have been. And, once again, we did the tabletop exercise and actual field walkdowns looking at the various water sources that may be used in this event.

MEMBER REMPE: So just to clarify, it wasn't just you interacted with headquarters, it was the licensee and you and headquarters personnel all sitting down at a tabletop exercise, right?

MR. CAHILL: Correct. It was research, NRR, the regions. Since we had done all the B5B inspections previously in the region and we have knowledge of the plants, with the addition of the residents, we could kind of, you know, put some, put our inputs in to make sure that the proper perspective is given.

It was a large effort by the licensee. We had senior reactor operators, field operators walking down the equipment. And with the exception of actually running hoses and spraying the pool, we pretty much went through the whole set up.

And that completes -- yes, sir?

MEMBER SCHULTZ: What you've described here is mainly focused on site activities versus response activities and emergency planning and response, off-site response?

MR. CAHILL: Correct. Our assistance was really dealing with the site, how the site was going to respond with the equipment that they have on hand. CHAIRMAN SKILLMAN: Colleagues, any further questions for Chris? Chris, thank you.

MR. ROGGE: Hi. I'm John Rogge. I am the Branch Chief of the Fire Protection Branch. I supervise eight inspectors conducting fire protection, cyber security type inspections currently. So I'm going to just give you a quick overview where we are, a little bit on the 805 Transition, where we stand with multiple spurious, and a special case of Indian Point.

Region I has plants in various conditions of where they got licensed during the time. We have fifteen plants which are pre-79 so they follow the Appendix R type rules; nine plants post-79 which are our branch technical position plants; and we have six that have decided that they're going to transition into 805.

The 805 plants originally were pretty much a fleet decision, so you're seeing the Nine Mile, Ginna, and Calvert Cliffs moving as a fleet. And Beaver Valley is tied to the FENOC fleet. So the decisions were pretty much made on fleets. During the process of starting reviews, Nine Mile 2 chose to drop out of the program, mainly because they have superior cable separation, and that was pretty much what was driving the decision to go into that space.

Beaver Valley did have to revise their schedule for submittal, mainly because of the discovery of they thought they would have synergy from a single PRA that would give them insights to two units. And their discovery was they really needed two PRAs. The PRAs are essential because they drive the modifications and where you're going to look for lowering risk.

The 805 Transition status. Of course, as those plants are going through the transition phase, we have enforcement discretion. The idea there is it's a voluntary transfer into the 805, and we want to encourage them to go through it in a diligent and robust way. And as they're finding issues, we don't want to penalize them for their

discovery of things that may have been beyond our ability to see using deterministic methods.

CHAIRMAN SKILLMAN: John, if I could back up one slide, please. The decision at Beaver Valley between the two PRAs --

MR. ROGGE: Yes.

CHAIRMAN SKILLMAN: -- is that decision applicable to other plants either in the region or throughout the rest of the fleet? It seems to me that's important because those are really two different units there at Beaver Valley.

MR. ROGGE: Yes. We would have seen it in at Nine Mile 1 or Nine Mile 2, and those are totally unique design plants. Beaver 1 and Beaver 2 are often referred to as one is like a Surry plant and one is like a North Anna plant. So when you're going into the various sub-system level, you even see where the nomenclature is there between the two units: pressures, temperatures. And then there's like an eight or eleven-year difference in when the decision was. So all our Westinghouse BWRs, they did not come out as, say, that plant. Even if you have the benefit of walking in the control room, you can see total differences in what happens at eleven years.

So that scope of work was not as appreciated. Did that answer your question?

CHAIRMAN SKILLMAN: I was really wondering if that, because they are so different and they need different PRAs, has propagated through other applicants who are recognizing `I really have two different machines on my hands.' TMI 1 and TMI 2 are like that.

MR. ROGGE: Right. I haven't heard of that. Now, of course, our pilot on Harrison's single-unit site and also with a three-unit site. And they have transitioned successfully. They have gone through the process of taking it out, and they are going through and putting the mods in.

In our region, Calvert Cliffs is our other two-unit site, and they plan on going through. Then again, they are a fleet. They're following the Nine Mile submittal replacement, so I'm not really clear if they have identified or have that kind of drawn out. I tend to see them as very similar design.

CHAIRMAN SKILLMAN: Thank you, John.

MEMBER STETKAR: John, do you do inspections or walkdowns or anything to confirm some of the information in the RA submittals? I'm

thinking mostly of cable routing. So when you say you think, for example, Calvert Cliffs are the same --

MR. ROGGE: Yes. The --

MEMBER STETKAR: -- do the region inspectors go in and actually ask for confirmation of that?

MR. ROGGE: Our current inspection program is to maintain the current licensee basis once we do the activities that you're talking about. So with Calvert Cliffs, because they made the transition, we're not going in and doing anything yet.

With the Nine Mile 1, which is the earlier submittal, we have done the on-site audit and we had one of our SRAs participate in the on-site audit. But when they actually get to the phase of the transition, then we're going to change our inspections and we'll go in and re-verify what --

MEMBER STETKAR: Okay. But I was trying to follow-up a little bit on what Dick was asking. You know, it's clear that Beaver Valley 1 and 2 are different. It's clear that Nine Mile 1 and 2 are different. What I thought I heard you say is Calvert Cliffs is going to come in with a unit PRA

and say that it applies for both the units, which means that the two units are presumed to be identical.

MR. ROGGE: There will be differences. There always have been, but they're moving together, just like Beaver Valley is moving together. But what I'm trying to say is I don't think they're going to have a discovery where, suddenly, they realize that the scope of work is distinct. I think they're going through it in a totally informed approach.

MEMBER STETKAR: Okay, thank you. Where are we on this?

MR. ROGGE: Okay. I was talking about enforcement discretion and its purpose is to encourage the identification of new and unique things. In order to implement the enforcement discretion, what we're doing are triennial fire protection inspections. We review the licensee's current findings' status and then the disposition in the inspection reports at that time.

It does show that there is merit to this program and that licensees are identifying things they otherwise wouldn't have done without all this engineering rigor and PRA focus. So today we have

dispositioned or transitioned or dispositioned 15 violations. If you'd like a site rundown, it's, basically, six of them at Ginna, one at Nine Mile, three at Beaver Valley, and I think I have it on the other slip. These may not be correct. So somehow I lost my slides with the answers, so that may not total to 15.

Any questions on what some of those might have been? Okay.

Moving on to MSOs. The 805 plants are going to disposition the MSOs as they're doing their 805 Transition. The remaining plants that I talked to before, which are the pre-79s and 79s, took on the project; and, essentially, all completed them. I do note one exception by Indian Point, which I'm going to talk about in a second. But we are looking at those during the fire triennials. To date, we haven't found any issues with programs the licensees have done.

Next slide. Single spurious at Indian Point has a story that I believe you may have been briefed on during the exemption process. I'm not really sure. But as part of a resolution, all plants were required to identify and resolve their non-compliances in a single spurious. It actually

came before the multiple spurious program as the first step. It also had enforcement discretion and encouraged people to go out and identify what their violations were and either correct them or, if they had been prior approved, come in for approval or not approval.

If you're a pre-79 plant, you needed an exemption. And Indian Point is a pre-79 plant, so they were required to not only have approval for their operator manual actions which were being used to compensate for the single spurious but they also had to go through the exemption process because it is against the Appendix R rule.

So as they went through that process, many of the exemptions ended up being denied. And they were denied for reasons mainly being not enough time margin and not enough defense in depth.

During the process, we did conduct a triennial inspection. And in that inspection, we identified that one of their operator manual actions was not feasible to be performed.

As part of the single spurious exemption approval process, they were expecting that those exemptions would be issued and that would also address their multiple spurious operations through

the exemption. That not being the case, they are now using that violation to correct their multiple spurious, so we see the double benefit there.

Any questions?

CHAIRMAN SKILLMAN: Colleagues, any questions for John? John, thank you.

MR. ROGGE: I will retire.

MR. MCKINLEY: Good morning, everybody. I'm Ray McKinley. I'm the Senior Emergency Response Coordinator here for Region I. I want to talk to you a little bit today about the region response to hurricanes.

Over the past couple of years, we've had some extreme challenges with regards to Hurricane Irene that was back in August of 2012; also Hurricane Sandy last year, also known as Superstorm Sandy; Winter Storm Nemo in the winter of 2013; and we've had a number of summer storms that have also been challenges for us. So we'll talk to you primarily here about hurricane response.

So we'll hit on the hurricane response procedure, some of our experiences with Hurricane Sandy, and just get a little bit into the 2013 forecast.

Our hurricane response procedure is

governed by an incident response procedure. We begin monitoring storm activity about 120 hours before projected landfall. And it's a stepwise approach as the storm approaches, and we'll escalate our response appropriately.

One of the biggest things we do is track the storm's progress and keep management informed of what's going on. We're essentially tracking the storm, the track of the storm, the size of the storm, and the intensity of the storm, and that helps inform us as to where we need to deploy additional inspectors and what is the response posture of this agency.

As the storm progresses, about 24 hours before impact, the intensity of our response gets a lot greater. We'll usually make a decision whether or not to go into monitoring mode within about 12 to 24 hours of landfall. And we'll also be aggressively monitoring licensee storm preparations as the storm approaches and as it passes over the facilities. And we'll be looking at power reactors, research and test reactors in coordination with NRR.

And we'll also be looking at materials licensees, and our materials licensees here in

Region I, they go all the way down to Puerto Rico and U.S. Virgin Islands into the southern states and on up into the northeast. So we have a pretty wide range of attention that we give these storms.

One of the other big things that we'll do is coordinate with FEMA and our headquarters with regards to infrastructure impact at the affected facilities. If plants shut down in advance of the storm or if they're shut down by the storm, they need to ensure reasonable assurance to be able to perform their off-site detective actions before they can restart. And we've improved this process over the past few years based on learnings that we've had with Irene and Sandy. What FEMA will do is what's called a preliminary capabilities assessment, and they'll determine whether or not they need to do a disaster-initiated review, which is a more thorough review, depending on the extent of infrastructure damage.

CHAIRMAN SKILLMAN: Ray, before you proceed --

MR. MCKINLEY: Yes, sir.

CHAIRMAN SKILLMAN: -- you say in that slide you coordinate with FEMA. What coordination is there with the dispatcher at PJM?

MR. MCKINLEY: We don't directly interact with PJM, although the facilities do. Their control rooms are in direct coordination. We can monitor the websites to have an idea of what's going on with PJM, and we also do interact with FEMA with regards to critical infrastructure. So we're constantly in discussions with other federal agencies to get a better understanding of impacts to off-site power sources and things of that nature.

MEMBER CORRADINI: So just to clarify so I understand, so when it comes to on-site activities, it's whether they go up or down in power, etcetera, in the preparation, you watch through the owner/operator. And when it comes to off-site, you watch through FEMA. But you don't directly interact -- what I'm trying to get at is I'm trying to understand the coordination when something like this happens and you have a lot of time to prepare and think through it. Is that the normal kind of process?

MR. MCKINLEY: Typically, yes. We'll monitor through the licensees, and they do have direct contact through their power system, operations dispatchers and --

MEMBER CORRADINI: For on-site.

MR. MCKINLEY: For on-site. And transmission networks. So they have those linkages with the licensees, so we can get information through our licensees on grid stability, things of that nature. We can also reach out through our federal counterparts and PJM indirectly, if we had a need to do that. We typically don't reach out directly to --

MEMBER CORRADINI: Because the normal protocol is to work through the owner/operator.

MR. MCKINLEY: That is correct.

MEMBER CORRADINI: Okay. And then one last question. With something like this when there's a lot of time, do you leave it to the on-site inspectors then to go through the technical support center or whatever appropriate location, or do you add staff to the sites in the path of the storm for just in case? I'm curious about it.

MR. MCKINLEY: Yes. I'm going to talk about --

MEMBER CORRADINI: All right.

MR. MCKINLEY: -- Sandy a little bit, and then that may answer some of your questions. So Hurricane Sandy. October 29th, this photo was taken at about 8:00 in the morning or so. And this storm

was just incredible with regards to the time of the year, very late in the season. In fact, hurricane season ends November 1st. And the National Weather Service itself had difficulty classifying this storm. As it approached the northeast, they stopped issuing hurricane warnings and called it a super storm. So some of those things were kind of interesting.

What also is very interesting is the track of this storm. This hard left that you see there, that's kind of your nightmare scenario. That's exactly the impact that you don't want to see. And it's that upper right quadrant of the storm that is a significant concern. The winds are a problem, but storm surge, that upper right quadrant, that's really where the impact occurred. The wave action, the storm runoff, that's where you can get some significant impacts to, you know, personnel, people, and the plants themselves.

CHAIRMAN SKILLMAN: Ray, just a question of clarification. What constitutes landfall? The leading edge of the storm, the eye of the storm, or some intermediate --

MR. MCKINLEY: Yes, it's eyewall passage where they classify landfall, but we look at it in

terms of impact. So, yes, it's a fuzzy line for us as far as -- we lean responding sooner rather than later.

CHAIRMAN SKILLMAN: Yes, yes, okay.

MR. MCKINLEY: But, yes, landfall is defined by eyewall passage.

CHAIRMAN SKILLMAN: Okay.

MR. MCKINLEY: With regards to inspectors, so as we're watching the storm develop, the challenge for us usually in Region I is, when these things hit us in the locations of our plants, we have a broad impact across our entire region. And this storm was clearly going to impact the entire region and not only our plants but this facility, the Region I office itself. So it's always a challenge for us.

So in this case, we deployed back-up inspectors to Calvert Cliffs on up north to Millstone and as far west as Three Mile Island. So in that bubble, we kind of had a pretty good feel that we would be pretty well protected based on what we could see with these wind fields and projected storm impacts.

And that call was pretty good. Most of the plants that we saw impacts at were at those

facilities, and we weren't significantly impacted at other ones, except further up north. You know, we occasionally will have problems up at the Great Lakes with grid system issues.

MEMBER CORRADINI: Why?

MR. MCKINLEY: If you have a significant disruption in grid operations, you can run into low-flow restrictions and, essentially load breach acts.

MEMBER CORRADINI: But is it the connection between the northeast and the MISO that, it's that connection point that --

MR. MCKINLEY: That's correct. Yes, in a broad network, it can become problem. Hurricane Sandy effects. So, specifically, in this region, as we saw the storm approach, at 10:20 in the morning we entered monitoring mode of incident response operations staff at our incident response center.

As the impact of the storm, it became obvious that our regional facility may be significantly impacted in terms of our infrastructure and our ability to respond, we handed off to our back-up region in accordance with our continuity of operations protocol. That's something we do very well as an agency. That handover was very seamless. We were also able to continue to

engage from home using technology to stay involved with our counterparts at our back-up region. And headquarters also had to hand off to their alternate facility to maintain the overall agency situational awareness.

Again, that went very seamlessly. It was very much a strength, as identified in our after-action report. And we were able to staff the center back up by noon the next day and totally re-engage. And this facility was actually very robust. We didn't even lose normal power, so we were very happy with that.

As far as plant impacts, Oyster Creek declared an alert due to intake water level. And the residents will speak a little bit more to the details of that, so I won't get into that.

Salem 1 shut down four of six circulating water pumps tripped due to high intake debris. Also, Nine Mile Point 1 and Indian Point 3 automatically shut down in response to grid disturbances.

A number of plants, we had Millstone reduce power preemptively in anticipation of potential circulating water issues, intake debris. So they backed their power down to avoid running

into problems there. Vermont Yankee had some low-flow restrictions, so, essentially, enough lines were down that they were limited to the amount of power they could push out through other transformer type systems, so they had to reduce power. And at Limerick, due to overall low load demand because so many transmission lines, distribution lines were down, the load was low on the system, so they reduced power, as well.

None of these plants had to initiate disaster-initiated reviews we coordinated with FEMA. Preliminary capabilities assessments were performed and determined that those plants could restart without any significant delays. And that's real important. We want to make sure that we don't negatively incentivize these licensees from doing the right thing. If they reduce power or shut down in advance of these storms, that's a good thing. So we want to allow them to hopefully get back up as expeditious as they can, as long as they meet their off-site requirements.

2013 hurricane forecast. It's going to be another busy season. You can see the average here. I don't think I've seen an average year here in quite some time. You can see last year 19

storms, ten hurricanes, two were major, Category 3 or above.

This year, we're already seeing them out there. As a matter of fact, Tropical Storm Dorian just fired up in the Atlantic. We'll be watching that as it approaches Puerto Rico this weekend and potential southeastern U.S. impact next week. But it's too soon to tell on that. But it will be another busy year.

That's really all I have. Any additional questions? Okay. Thank you.

CHAIRMAN SKILLMAN: Thank you, Ray.

MR. PATEL: Hello. My name is -- can you hear me? Hello. My name is Amar Patel. I'm the resident inspector at Oyster Creek. And during Superstorm Sandy, I was on site for the response. Is that better?

My name is Amar Patel. I'm the resident inspector at Oyster Creek. I was on site during the Superstorm Sandy, and as well as the Senior Resident Jeff Kulp and another operations examiner, Tom Hedigan. And at the time, the plant was shut down for a normal refueling outage, and the reactor vessel head was removed, the spent fuel pool gates were also removed, and the refueling cavity was

flooded.

Decay heat removal was through the shutdown cooling pumps and the fuel pool cooling pumps. And then they were then subsequently cooled reactor building cooling water system, and then that's also cooled by service water.

Now, here's a general time line of events during the Superstorm Sandy. Two major issues occurred: the extended loss of off-site power which lasted approximately 30 hours and a flooding event that challenged the decay heat removal.

Now, there's a picture of the intake structure at Oyster Creek. You'll see it's exposed to elements, again, not like a lot of sites. But you've got your four ESW pumps, emergency service water pumps, and your two service water pumps. And the concrete base there, that's actually six feet, so that will be important for the other operation when I discuss it a little bit later.

On the right-hand side -- no, that's fine. You know what? I can see it better. Here's a cross-sectional view of Oyster Creek, the intake structure, and normal water level is zero feet.

Now, as the water level rose above 4.5 feet, which is their emergency action level

declaration for unusual event, they declared an unusual event and they would declare it at 4.65 feet. Now, as the level rose above 6 feet, which is the alert declaration, they declared the alert, and they declared at 6.25 feet and rising.

Now, at 1218, the highest level during Superstorm Sandy was 7.4 feet. And to note there, the importance piece of the intake during refueling outage is the service water pumps, and the impact to service water pumps is actually at 10.3 feet. In 1962, the highest level reached before Sandy was 4.5 feet.

MEMBER STETKAR: So in Sandy, the ESW pumps kept running is what I'm hearing, but the SW pumps probably did not; is that correct? Because there --

MR. PATEL: Well, the ESW pumps are actually lower than the service water pumps. They didn't need the emergency service water pumps at the time.

MEMBER SCHULTZ: But they were flooded?

MR. PATEL: They were not flooded, but they still had some margin. I could probably, I'm just going to assume and just guess they were about

a foot lower than the service water pumps, so they were not flooded.

MEMBER CORRADINI: But just to clarify John's question, what was running at the time all of this occurring?

MR. PATEL: The service water pumps, the two service water --

MEMBER STETKAR: What cools the reactor, the cooling water that --

MR. PATEL: Service water.

MEMBER STETKAR: Oh, service water. Okay.

MR. PATEL: Yes. The emergency service water pumps at Oyster Creek and the go in there and spray each --

(Simultaneous speaking.)

MEMBER ARMIJO: At 10.3 feet, what happens? Electrical shorting of the pumps or --

MR. PATEL: I can go to the next slide. So there's a picture of the service water pump. So the highest level recorded was 7.4 feet, and at 10.3 feet the impact to the motors -- I'm guessing it'll impact the electrical flow.

MEMBER CORRADINI: So just for, you don't have to go back but you had all these lines

before. So the concrete deck was at six point something, so they were --

MR. PATEL: Six point zero.

MEMBER CORRADINI: So they were about a foot of water sitting on the deck?

MR. PATEL: Yes.

MEMBER CORRADINI: Okay. And is it planned that there's drainage so that, if it sits on the deck and there's a recession, it goes off and down or it has to, you know, would there be standing water after stuff --

MR. PATEL: No, it would naturally drain back down because that's where the intake, the intake --

MEMBER CORRADINI: Okay, all right. Sorry.

MEMBER RAY: Before I feel too comfortable with the 7.4 feet, this was a big storm, so there must have been waves coming in at higher levels than the 7.4 feet.

MR. PATEL: It wasn't really, there wasn't any waves, like at the beach or something like that. At the Barnegat Bay is where they had the suction problems, so it was actually the level was rising. We didn't see any wave action.

MEMBER CORRADINI: Was anybody out there?

MR. PATEL: Yes, operators were out there, and you have your security guards were also out there. The operators actually, where they read the level indicator, they actually had to go out into the intake structure to actually read the level.

MEMBER BANERJEE: I mean, the wave action may not be anything else than wind. But with the water level up there, with the wind you could get wave action.

MEMBER ARMIJO: I'm kind of on the same track. With massive amounts of salt water spraying or splashing against things, that would cause the motors to short out. You didn't see anything like that?

MR. PATEL: No. And just a point, after the storm, their engineering department did do an evaluation of components in the intake structure to determine any impacts based on the storm, based on any salt water interactions, and their evaluation didn't see any effects.

MEMBER SCHULTZ: Let me ask this question. During the storm, what was the condition

of the parking lot and Route 9? This water was coming in Barnegat Inlet into the bay.

MR. PATEL: Yes. The parking lot is actually --

MEMBER SCHULTZ: Say again, please.

MR. PATEL: The parking lot is actually at 23 feet.

MEMBER SCHULTZ: At 23 feet.

MR. PATEL: Yes.

MEMBER SCHULTZ: Okay. So Route 9 was also dry --

MR. PATEL: Yes.

MEMBER SCHULTZ: Okay, thank you.

MR. PATEL: Here's a picture of the normal water level, and there's just a picture of the intake level stick they would read intake levels. And normal water level is around zero feet.

And here's a picture during the storm. Now, the picture is not that clear, but, if you can see the top of the stick, that's where the level rose. And you can see the traveling water screens were actually in the back of the photo to your top right. And the intake level, the intake level stick is on the left-hand side. So I just wanted to show you the perspective of during the storm.

Now, here's a, this is a picture of the initiating event at Oyster Creek during the storm. Due to weather conditions and, specifically, the winds, they caused a wall to collapse in the Oyster Creek switchyard that caused a loss of offsite power. Subsequently to this, the diesel generator started successfully and shut down cooling pumps in the spent fuel pool. The spent fuel cooling pumps were powered from the diesel.

MEMBER SCHULTZ: What's the function of that wall?

MR. PATEL: The function of the wall was, it was actually built in the `80s for fire protection purposes. The separation between the two -- that's all it was.

CHAIRMAN SKILLMAN: It seems like this is an important image because an active fire barrier with phase transformers --

MR. PATEL: Those are both regulators.

CHAIRMAN SKILLMAN: Okay. And so that is a fire barrier for whatever commitment that Oyster Creek made back in this time period, and it raises the question do they understand what is required for the strength of that wall?

MR. PATEL: Just a note that this

switchyard is not actually owned by Oyster Creek. It's actually owned by First Energy and Jersey Central Power and Light. So I'm not sure exactly what the details were when they made this -- they actually built this wall in the `80s, so I believe it was a modification, and I'm not sure exactly what the details were during the modification process of all their, of what they were analyzed for, you know, what they designed their wall to for high winds. I'm really not, I'm not sure.

Now, a special inspection was conducted for this event because one of the deterministic criteria was met due to issues concerning implementation of the emergency preparedness program during an actual event and involving a classification of notification process during the declaration of an alert due to a high level in the intake. A 10 CFR 5047 contains risk-significant planning, standards for maintaining and implementing a standard emergency classification scheme, and for notifying state and local organizations.

Failure to timely classify, declare, and notify state and local officials would adversely impact the risk-significant planning standards. Now, for these reasons, the region decided to

conduct a special inspection.

Now, the special inspection team concluded that the licensee's performance was acceptable and the action levels, emergency action level declarations were timely. The results of the special inspection team are documented in the inspection report listed on this slide.

So that's all I have prepared.

CHAIRMAN SKILLMAN: I'd like to go back to that image of that wall. Is that the only one at Oyster Creek, or are there others that might be between components that could also lead to a loss of off-site power? Extended condition is what I'm really asking about.

MEMBER CORRADINI: Just a clarification, Dick. I want to make sure this is not at Oyster Creek, this is at the switchyard owned by another --

CHAIRMAN SKILLMAN: Hold that thought. It's easy to say, gee whiz, it's the plant's problem. But the plant is dependent upon the switchyard that's 200 yards away, and it's owned by Joe Blow Electrical Services and that switchyard can affect the plant.

MEMBER CORRADINI: I don't disagree. I just want to make sure --

CHAIRMAN SKILLMAN: I'm not sure we have the freedom to not reach out and touch somebody. I'm wondering if there's something else we've got to talk about.

MR. PATEL: Right. Now, they did subsequently remove this wall, so they did do a modification to actually remove this wall. So going forward, this event would not occur due to high winds because there's no wall.

MEMBER RAY: What about the event for which it was put there in the first place?

MEMBER STETKAR: If I'm going to have a voltage regulator blow up, it's going to take out everything.

MR. PATEL: Right. But I didn't look at the modification to remove the wall, so I don't know exactly what, you know, the reasons.

MEMBER CORRADINI: So most of my colleagues know this, but I don't. So where does the regulatory authority of NRC end for something like this? That is --

MEMBER RAY: Before you get there.

MEMBER CORRADINI: That's what I thought. That's what I thought.

MEMBER RAY: Absolutely, positively.

MEMBER ARMIJO: I have a question. I don't know anything about switchyards. So it seems to me that this is a very local event that caused such a loss of off-site power. There's no redundancy or some other way with just local damage here would keep supplying power to the plant? I mean --

MR. PATEL: A lot of New Jersey from the shore actually lost power, so it wasn't just localized to Oyster Creek. It was from I think Atlantic City all the way up to --

MEMBER ARMIJO: Okay. So there were other --

MR. PATEL: It was pretty much the whole east coast of New Jersey --

MEMBER ARMIJO: Okay.

MR. PATEL: -- you know, lost power.

MEMBER ARMIJO: Got it.

MR. POWELL: Do we still have an open question on regulatory authority?

MEMBER RAY: No.

MR. POWELL: Okay.

MEMBER BANERJEE: Was he correct?

CHAIRMAN SKILLMAN: Colleagues, any other questions for Amar? Amar, thank you.

MR. PATEL: Thank you.

MR. FERDAS: Okay. Are we going to continue or --

CHAIRMAN SKILLMAN: No, please continue.

MR. FERDAS: Okay. Thank you.

MEMBER BLEY: I don't want to upset your applecart before you start, but, somewhere in your discussion, could you tell us a little bit about Georgia ending up on probation? That seems very unusual to me.

MR. FERDAS: Well, I can get someone that can talk to that. Do you want to do that now, or would you want to --

MEMBER BLEY: Either way.

MR. FERDAS: Okay. I'm going to hand it over to my boss.

MEMBER BLEY: Okay.

MR. LORSON: Hi. My name is Ray Lorson. I'm the Director for the Division of Nuclear Materials Safety. We have a program called an agreement state program where we relinquish regulatory authority to agreement states if they are adequate and their programs are compatible with the NRC's programs.

Georgia became an agreement state

approximately 50 years ago and has been operating their program successfully since that period of time. We have a requirement to periodically assess the adequacy of the state programs. We use a process that's called the IMPEP process, and we conduct these reviews about every four or five years at agreement states to confirm that the programs remain adequate and compatible with the NRC's program.

We conducted an IMPEP review last fall and, as a result of that review, identified some areas where the state's program required attention and, specifically, in the area such as event response or responses to allegations. Some of their inspection frequencies were a little less frequent than what the NRC would require.

As a result of that process, we follow up the team's assessment with something called a management review board, and that's a publically-available meeting that's shared by the Deputy Executive Director for Materials, Mike Webber. At the conclusion of that meeting, there was a recommendation, and the then review board agreed with the staff recommendation to place the program on probation.

What that means is that there is oversight by the NRC of the same program. It basically requires the state to develop a formal written improvement plan that gets submitted to the NRC for review and approval. And right now, at this point, the state is implementing the performance improvement plan and actually making progress.

There was actually no specific individual or release of material that was associated with their state program performance. It was really programmatic concerns associated with the implementation of the program.

The process of probation is something that has to be approved by the Commission. And the Commission just completed their vote and there was consensus on the issue that basically endorses that recommendation and places them on probation. It's a little different than something called heightened oversight where we place an increased state of focus from NRC that does not require Commission approval.

The big differentiator between oversight as opposed to probation is that probation is a much more public process. It involves more in the way of formal communications, including a letter from the

chairman or the governor of Georgia.

MEMBER BLEY: Is this kind of a normal process, or is this unique?

MR. LORSON: The IMPEP process is a normal process we do on agreements, so all the 38 agreement states across the country. Placing a state on probation, this is the first time we've ever actually implemented that part of the IMPEP process, so this is a first-time use of that tool. And the goal is to use the goal to help focus senior state management on the necessary actions to improve the program so we have confidence in the long-term viability of the program. MEMBER BLEY: Thanks for the briefing. I haven't known much about this before.

MR. LORSON: Okay. Thank you.

MR. FERDAS: Okay. My name is Marc Ferdas. In our Division of Nuclear Materials Safety, I'm the Branch Chief responsible for our decommissioning branch. The question that probably initially comes up is how does materials and reactors come, how do I come to sit in this chair when it's a meeting on reactors? But our materials program does encompass some of the reactor programs, specifically reactor decommissioning and the

independent spent fuel storage installation program.

I just wanted correct one thing that I said earlier when the question came up on the research and test reactors. The third one is the NS Savannah. I was thinking universities in my head, and a boat did not come to mind on that one. But it's an odd one where it's characterized.

CHAIRMAN SKILLMAN: Let's correct the boat. It's 35,000 real tons of real ship.

MR. FERDAS: Yes, it's a ship. It's a ship.

MEMBER SCHULTZ: You had to say that, didn't you?

MR. FERDAS: It's a ship with a kitchen. Today, I plan to talk about two areas that my group has responsibility for. First is the decommissioning of Crystal River 3, and second is the Indian Point inter-unit wet fuel transfer operations that they have begun last year and will continue through the life of their plant.

Decommissioning of Crystal River 3. Basically, in February of this year, Duke Energy announced that they were not going to restart Crystal River Unit 3 after several years of looking for possible repair plans and methods for the issue

that they experienced with cracking of their containment vessel or delamination, which I think that's been talked at at great length so I won't get into that.

Subsequent to that public announcement, they sent the NRC a letter certifying the fuel has been permanently removed from the vessel and that they were no longer authorized to operate the reactor. At that point, both the inspection process and the licensing process shifts from an operating plant to a shut-down plant for decommissioning.

They have announced that they do plan to enter safe store, and what safe store basically is is maintaining the plant and the fuel in a stable condition until decommissioning or dismantlement takes place. During that time, they are responsible to maintain a variety of programs, such as security, emergency preparedness, environmental monitoring. They do do maintenance on the facilities during that time, as I said, to keep it in a stable condition. And the whole idea of entering safe store is to allow radioactive decay to naturally occur, thus reducing the cost, as well as the radiation exposure to workers for dismantling the plant.

We do have an oversight program for

that. We use Inspection Manual Chapter 2561 that lays out our oversight responsibilities. In that chapter, it basically walks you through the life of a decommissioning plant. Right now, Crystal River is in the transitioning to safe store. You have an operating plant, and you need to transition to where they're going to maintain it for long-term storage. And that involves, in the near-term, they'll be looking to deactivate systems, drain systems, process water that still remains within the plant, look to reduce some of their regulatory requirements through licensing and tech spec changes with that.

In addition, what makes this kind of a unique item for us is Crystal River 3 is in Region II. We're in Region I here. However, working with Region II, in conjunction, we felt that it would better serve for the decommissioning oversight process to transfer here mainly for one reason: that we have the resources and the staff that can do the decommissioning work.

And the reason for that is back in about the mid 2000s there was a consolidation of the materials programs where Region II licensees came to Region I, and we took the staff with that. So at this point, Region II really does not have staff

qualified to perform the inspections under 2561, and we still maintain that capability.

So as I said, we're in the process of doing that transfer. There has been an agreement come August 1st where Region I will take over full oversight responsibility with one caveat: we are going to delay the transfer or incident response functions until after this hurricane season, you know, to December 1st to allow us a little more time to get our infrastructure in place in terms of what we need in our IRC communication protocol, etcetera. So we'll be doing that.

And in the near future we plan on sending a letter to the licensee announcing our inspection program, what we plan to do in terms of future inspections. I can't really get into that at this point.

Just for awareness, headquarters is, we are working with headquarters. They have established a working group to look at enhancing our inspection manual chapter and procedures. As you know, decommissioning of reactors has not occurred for some period of time. There are two in progress, Humboldt Bay and Zion. But, basically, with all the regions getting together, we identified, you know,

lessons learned from those. We have our own lessons learned from the Yankee plants, and we need to just beef up our infrastructure just for clarity for what we should look at. So that's a big undertaking.

However, I will say what we have in place now is adequate. We can do the inspections and adequate oversight, but there's always room for improvement in making those documents life-long documents for when I'm not here a long time from now, for knowledge transfer, you know, there's a good pedigree for inspection process because there's going to be more sites decommissioned.

MEMBER STETKAR: Marc, are you running the, since you're going to take over Crystal River 3, are you running Zion out of this region?

MR. FERDAS: No, Region III does have that capability to maintain it. It's really when our materials program emerged, that Region II and Region I aspect, where we kept that.

MEMBER STETKAR: Okay.

MR. FERDAS: And Region IV does their own decommissioning. Any questions? Okay. I've got three minutes, and I will note that my boss took two of my minutes to get us back on target.

Next is Indian Point. You know, this

is, truly, I would say, a unique method that Entergy used to manage their spent fuel at the site. Back in summer of 2012, under a Part 50 license, they received approval to utilize this method. And, basically, what it entails is, you know, it's a wet transfer, so it's in a cask filled with water with multi-connections where they transfer 12 spent fuel assemblies from Unit 3 and ship it over to Unit 2 into the pool, and then it's processed as a normal dry cask storage out to their storage pad. And the reason for that is they had both physical, I would say both physical and financial limitations to their ability to upgrade the crane in Unit 3 based on configurations, instrumentation in the plant, how the plant is structured. For Unit 2, it was a great undertaking to upgrade to a single failure-approved, 100-ton, approximately 100-ton crane. I know they had to drill into bedrock in order to get, you know, adequate connections and footings and that. So there was good reasons for this plan.

Entergy did work with HOLTEC to design the system. To date, there's been -- and I'll have some pictures in the next slides to show kind of working through the process. But, to date, they've completed 16 of these inter-unit wet fuel transfers.

That's approximately 192 assemblies. From there, 96 of those Unit 3 spent fuel assemblies have been transported to their spent fuel, to the pad.

Oversight of this was also unique. We did not have any inspection guidance in place at the time. We, with help from headquarters, reactors, program offices, and spent fuel offices, developed a new inspection procedure to cover this. Basically, it really leveraged the knowledge that we had from dry cask storage. In the end, it's almost very similar to dry cask storage operations.

I'll point out some of the unique aspects. I would say, as I said, it's a Part 50 license. Typically, a dry cask is under Part 72 process. The shielded transfer for canister is placed directly into the Unit 3 spent fuel pool and the Unit 2 spent fuel pool. Normally, it would be placed in a high-track system in this pool. That wasn't done because of contamination concerns. You're going to be seeing this. They're going to be taking this out of Unit 3 over a roadway, internal-to-plant roadway, so you didn't want to have contamination on your high-track and potentially spreading it throughout the facility.

During transport, as I said, it's filled

with water and has a bolted lid connection. Most dry cask storage are weld lid shut canisters. Once the fuel is in there, you know, the idea is you're not going to be going back in to get it.

And then the other thing, too, is the components used, the STC, the high-track, are going to be used multiple times over the life of the plant. It's basically a vessel. Once it gets over to Unit 2, it comes back again to Unit 3 to add another set of fuel to it. And there's various preventive maintenance activities, inspections, that they have to do along the way to ensure that it's still maintaining it's safety function and margins.

Go to the next slide. The pictures here that I have is, basically, the first picture in the upper left-hand corner is an STC getting ready to go into the Unit 3 spent fuel pool. As I said, at that time, it's loaded with 12 fuel assemblies, very similar to a dry cask storage and normal operations for a plant if you do fuel handling.

MEMBER ARMIJO: Now, this STC has the bolted --

MR. FERDAS: Yes, what happens is it goes in without lid, okay, and they put the lid on under water. It's not bolted at that point, but

it's lifted out with the lid on. And then what's not shown in the middle picture would be it's taken out, and then, the high-track process with the STC inside of it, they'll bolt it up. They'll do the bolting of the lid, and they do various pressure tests. There's a 24-hour hold where they do a pressurized test. The reason for that is to look for any mis-loads of the fuel. However, there's robust measures on the front to make sure they've taken the right fuel for that canister.

What's also not shown is then the high-track lid would be installed, and that's also bolted down and then pressure tested, as well. And then you get to the next picture is this is the high-track with the STC outside of the Unit 3 building. What happens, if you can see those orange pads underneath, that's an air pad system where they have ladders underneath with a tugger and they move the STC outside the building at that point. So it's a very orchestrated of the individuals working the pneumatics to slide that out of the Unit 3 building.

MEMBER CORRADINI: Like a big piece of furniture.

MR. FERDAS: Yes. The next picture is,

once it's outside the building, the vertical cask transporter, otherwise known as the VCT, picks up the high-track and then it's transported over to the other unit, all within the protected area over a pad that has been designed for that weight of, you know, the over 40 times now with the VCT there.

Then, after that, it's transported into the Unit 2 spent fuel pool. And here you have the STC being lifted out of the high-track and being placed into the Unit 3 spent fuel pool.

MEMBER ARMIJO: Now, it's being put back into -- now, it's still bolted up?

MR. FERDAS: It becomes -- it's unbolted. It's unbolted with the lid on, and then they'll lift, then they remove the lid once it's in the spent fuel pool at that point.

MEMBER ARMIJO: Okay. And then the fuel stays there until it goes off to --

MR. FERDAS: Yes. Based on the amendment, they have a special section in the Unit 2 fuel pool where the Unit 3 fuel needs to remain. But like I said, they've already taken some of that Unit 3 fuel out to the pad with a normal cask --

MEMBER ARMIJO: Is this --

MEMBER BANERJEE: That cask is filled

with water?

MR. FERDAS: The small one is filled with water and bolted, yet. They leave a small, if I recall, maybe an 18-inch gap there for some steam expansion. But you'll get equilibrium eventually. It's not going to heat up and boil with no safety relief function, but it does leave a little steam gap for that.

MEMBER ARMIJO: Is this going to be the standard process then for this plant to --

MR. FERDAS: Yes, it is.

MEMBER ARMIJO: Okay.

MR. FERDAS: Yes. They looked at various methods, and this is the method that will be used for the life of the plant.

MEMBER ARMIJO: Will there be, is this approved for transfer of, let's say, leaking fuel or damaged --

MR. FERDAS: No, no. It only has the intact fuel.

MEMBER ARMIJO: Okay. So that would be a special case?

MR. FERDAS: Yes, that would be a special case. Yes. Just like any other dry cask, leaking fuel you can't put in. You'd have to

canister it, etcetera. They would need a different type of configuration to do that with their baskets.

CHAIRMAN SKILLMAN: Marc, does the licensee have only one transfer inter-cask --

MR. FERDAS: My understanding is yes, yes, it does.

CHAIRMAN SKILLMAN: Okay. So once that is lowered into the pool, those assemblies are removed and then that cask is cleaned --

MR. FERDAS: And then the process is in reverse.

CHAIRMAN SKILLMAN: Got you. Thank you. Colleagues, any further questions for Marc? Marc, thank you.

MR. FERDAS: Thank you.

MEMBER RAY: While the next -- well, before we conclude, let me add to what I said to you guys a little bit ago. Design criteria part two for off-site power to the plant, it allows the signals to reach the yard, and it imposes no design requirements on either the circuits or the switchyard. Access to the switchyard and control of the switchyard is a different matter, in terms of individual plant operators. When it comes to design

of the switchyard for external events, that's not part of our criteria.

If, for any reason, off-site power is considered unreliable, including the switchyard vulnerability, then additional on-site emergency power may be required.

CHAIRMAN SKILLMAN: Thank you. I would like to ask whether or not there are any public comments, comments from the public, please. Phone line? Is there anybody on the phone line, please?

MR. JANATI: Yes, no comment.

CHAIRMAN SKILLMAN: Would you please identify yourself?

MR. JANATI: Yes, it's Richard Janati.

CHAIRMAN SKILLMAN: Oh, Rich, thank you. Anybody else on the phone line, please? Hearing none, Bill, Bill Dean, please.

MR. DEAN: Thank you, Dick. First of all, let me thank the Committee for taking the time to come up here over the last couple of days. I think that some of our staff have been in here observing the proceedings. We invited a lot of them to come so they have a chance to understand what our brethren in headquarters have to go through often with the Committee in terms of the depth of

questioning and interest that you have in many matters and the service that this committee provides the Agency in terms of its continuing probing and intellectual curiosity and so on. I think it really strengthens this agency in the technical decision that we make. So I think it was great for our staff to be able to observe you all in action, and thanks for coming out here to do that.

The only thing that I really wanted to mention in terms of closing remarks, first of all, is that we do have a couple of things I wanted to share with you in terms of areas of focus going forward for the region. Obviously, maintaining our focus on plant safety through our inspection and oversight processes, both on the reactors side and the materials side, is paramount. I mean, that's our bread and butter here in the regions.

But we're also going to be challenged over the next couple of years in terms of, and you got a little bit of a taste of it from Justin Heinly's presentation about what he found in looking at flooding actions. But post-Fukushima related activities, we're going to see more and more action on the region plate as things move from the processes going on at headquarters to actual

implementation. And so we see that as a challenge and a focus area for us for the next couple of years.

Obviously, I mentioned at the outset, our unique environment that we have with all of our external stakeholders in making sure that we appropriately communicate with and listen to our external stakeholders and process that information appropriately.

And then, obviously, in the environment that we find ourselves in in a federal family with sequestration and other budgetary considerations is being able to sustain both the recruitment and the retention of highly-qualified staff to be able to conduct the inspections that we need to. So those are some of the high-level focus areas for us that we have in the region. And I don't know if that opens the door for any questions from you all.

MEMBER STETKAR: Yes, Bill, the last bullet there, given the situation and the expected projection over the next year or two or so, have you seen negative effects on your staffing? Have you experienced an erosion of staff here?

MR. DEAN: No. In fact, the big challenge that we have, I think, in Region I

relative to staff retention is the fact that our proximity to headquarters and the value that many at the headquarters office has placed on people with regional experience is that I think we see a little bit more of an exodus of some of our highly-qualified staff in the positions in headquarters.

I, myself, started in a region, and I was in Region II when I started, and I saw an opportunity at headquarters. And then, after four or five years in the region, I moved to headquarters. And so, you know, for those that don't see a future for them, you know, as quickly maybe as they would like sometimes, headquarters provides a little bit more opportunity.

That's declined a bit over the last couple of years, not because of sequestration but because of the Agency's focus on salaries and benefits and the fact that we're fairly high, government-wide, in terms of what the salary and benefits structure is for this agency. And so there's been a concerted effort to reduce that. And you're seeing, you know, downsizing, obviously, with not as many new reactors coming to the floor. You know, we had this tremendous growth over a certain period of time, anticipating many new reactors, and

that has sort of downsized, you know, in light of natural gas prices and things like that. So we're actually doing some natural downsizing as an agency because of that, and I think you all have been more with the third building down there and, you know, maybe we really didn't need that third building after all. I'm glad I'm up here. I've got my building here. I got that done before we came under those constraints but --

MEMBER STETKAR: Keep the meeting room open. We may be up here.

MR. DEAN: Yes, okay. I know this is not quite the same as the setup you have down in headquarters.

MEMBER STETKAR: You haven't seen a drain out to the industry, an increasing drain?

MR. DEAN: Not to the industry. In fact, to be honest with you, the industry that's impacted us the most the last year is we lost several of our people to Google.

MEMBER STETKAR: Is that right?

MR. DEAN: Yes, several people have left, some of our qualified inspectors have left to go work for Google. So that's been the biggest drain on us.

MEMBER SCHULTZ: As you describe it, the path to regional toward headquarters, is there not enough emphasis at headquarters for regional experience to send those from headquarters to the regions? I think it's invaluable.

MR. DEAN: Yes. No, thank you for that. As a matter of fact, we just went through our process for selecting the next individuals to be in our SES candidate-development program. And mobility to the regions was a consideration in the selection process, and so headquarters does value the regional experience and that's why, you know, we see a number of our people, you know, going the other direction sometimes. It's a bit of a challenge, but, to be honest with you, we've actually, over the last year to two, have hired a number of people from headquarters who wanted to come out and get the regional experience.

And so I think it's a two-way street. But, you know, for us, we've had a lot of losses of a lot of our qualified staff to headquarters.

MEMBER REMPE: So as you try to implement Fukushima actions, do you anticipate you'll have a budget for the staff required? Are there any juggling and over-stressed, or do you have any feel

for that?

MR. DEAN: You know, if past is prologue, I think there certainly is a great sensitivity on the part of headquarters to not overburden the regions. I actually sit on the Agency's JLV steering committee. And as they were preparing to do these flooding and seismic audits, they were actually making a concerted decision not to incorporate regional participation in those. And I pushed for regional participation on those audits because of the value, and I think you heard it from some of our inspectors today, the value that they would provide to those teams, and it was the right decision.

But we want to be engaged, we want to be involved. And, you know, within the budgeting of regional resources, there's some flexibility there. Part of the regional allocation of resources is devoted towards temporary instructions, which are maybe a one-time inspection activity. And so there's certain resources that we built into our allocation to allow us to do those sort of things. And, really, it's the matter of being able to find the right people that are not involved in other

activities.

I mentioned at the outset about our support to Region II and Region IV for 95003 inspections and the Fort Calhoun 0350 process. Again, that's something that's built into the overall budget for the oversight program is that we anticipate a couple of those inspections on an annual basis. And so those resources are kind of divvied up amongst the regions, you know, not in any specific way, but it's sort of a cushion that is built into the program to allow for emergent type events.

So I don't sense that there's going to be a lot of challenges at this point. But it will take some juggling.

CHAIRMAN SKILLMAN: Colleagues, any other questions or comments?

MEMBER SCHULTZ: I wanted to bring up one topic again associated with ensuring continued plant safety, and that's the Oyster Creek shutdown schedule and the oversight that ought to be required associated with that because we need to recognize that, both the region and headquarters, that this is a first-of-a-kind activity. Yes, plants have shut down previously, but they've really been termed what

you would consider immediate shutdown over a regulatory concern or a financial concern. The plant does not go through a six-year process of shutdown, as Oyster Creek will, and I think that additional attention to the oversight process ought to be both determined, developed, and implemented appropriately because this is not the first time this is going to happen and we need to prepare for it properly.

I understand things like golden handcuffs may sound as if it's going to take care of the problem, but we all know that, in terms of operation of a safe nuclear facility, everyone contributes to that within the staff. Hundreds and hundreds of people need to be focused on a safety-conscious work environment to assure plant safety. So we need to develop activities of oversight that assure that.

MR. DEAN: Yes, you're actually right, Steve. And I think, you know, we certainly have heard that message. I know it's something that we've been looking at. I think, earlier, there was some discussion about development of an appropriate inspection module at headquarters for plants because, you're right, Oyster Creek may not be the

only plant.

And one of the things that I wanted to mention with respect to Oyster Creek that sort of defines some of the unique environment that we operate in is that the state of New Jersey has a very strong engagement with respect to Oyster Creek. As a matter of fact, they have a special oversight committee chaired by the director of the Department of Environmental Protection in New Jersey, Bob Martin, that, sometime in the next couple of months, will issue a report based on their findings over the last year or so in terms of what should oversight at Oyster Creek look like. They certainly recognize the NRC's preeminent role in terms of public health and safety, but they certainly have interest and equity in the safe operation of that plant, too. And so New Jersey has taken a very active role in assuring that we do, you know, as you say, provide appropriate oversight in the final years of Oyster Creek operation. So I appreciate that.

And I'm sorry, Dick. If there's no more questions, I do want to thank Mel Gray and his team for all that they've done over the last couple of months, actually, this process working with Quynh, to coordinate your guys' visit to Peach Bottom, as

well as the visit and the agenda here. They did, I think, a great job in trying to pull this all together. And, hopefully, we were able to provide you the support that you needed.

And I also want to thank all of my staff. They did such a great job in terms of preparing for and providing you all presentations today. I think they did a great job overall.

CHAIRMAN SKILLMAN: Thank you. Let me finish on this note. I want to thank the region, everybody who has contributed to this very productive piece of time for your preparation but, more importantly, for your professionalism and holding high the standard of nuclear safety up in Region I. Thank you for that.

I particularly want to recognize the inspectors. That is a tough job, and you really are the first line. So thank you for the work that you do to keep the thick magnifying glass on the plants to keep all of us safe.

And I want to thank Quynh, who has really done the bulk of the work, to let us come here and to be at Peach Bottom yesterday. It's been very smooth and very effective. So, Quynh, thank you. And, Bill, thank you very much. We are

adjourned.

(Whereupon, the foregoing matter was concluded at 11:50 a.m.)

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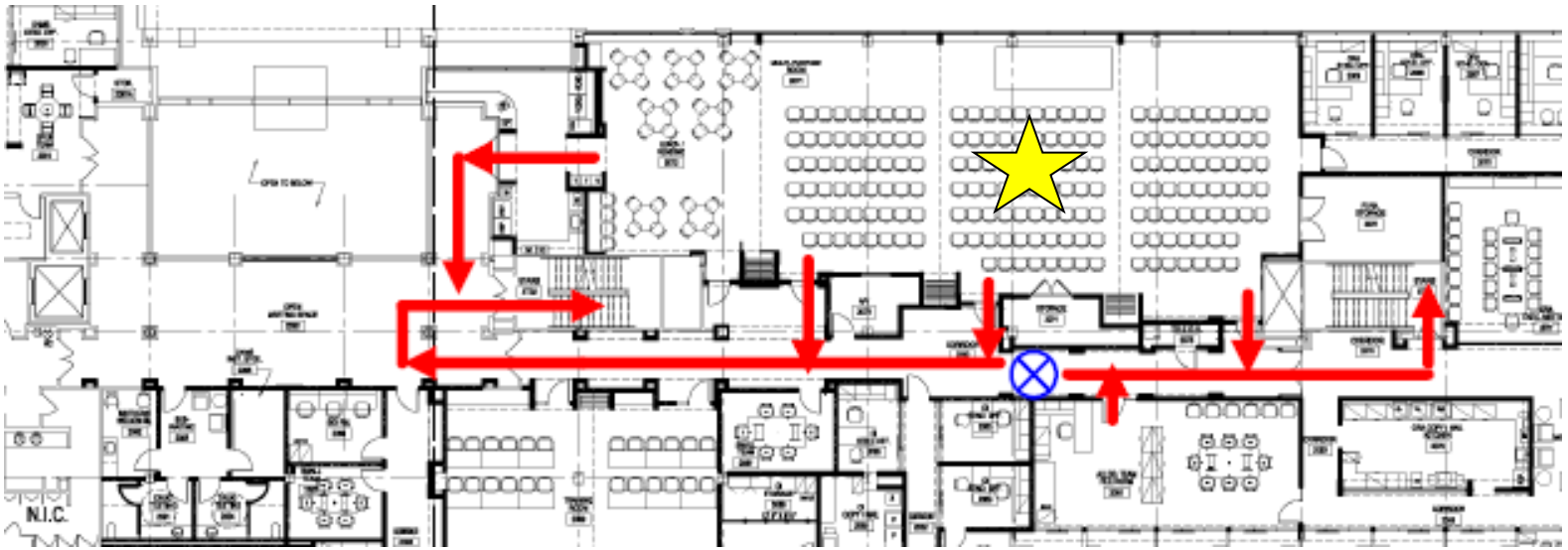
Welcome and Overview of Region I

July 24, 2013

Bill Dean
Regional Administrator
Region I

Introduction:

- Safety (exit routes in red in event of an alarm)
- Security
- Meeting is being transcribed for public record (Category 1)
- Teleconference attendance



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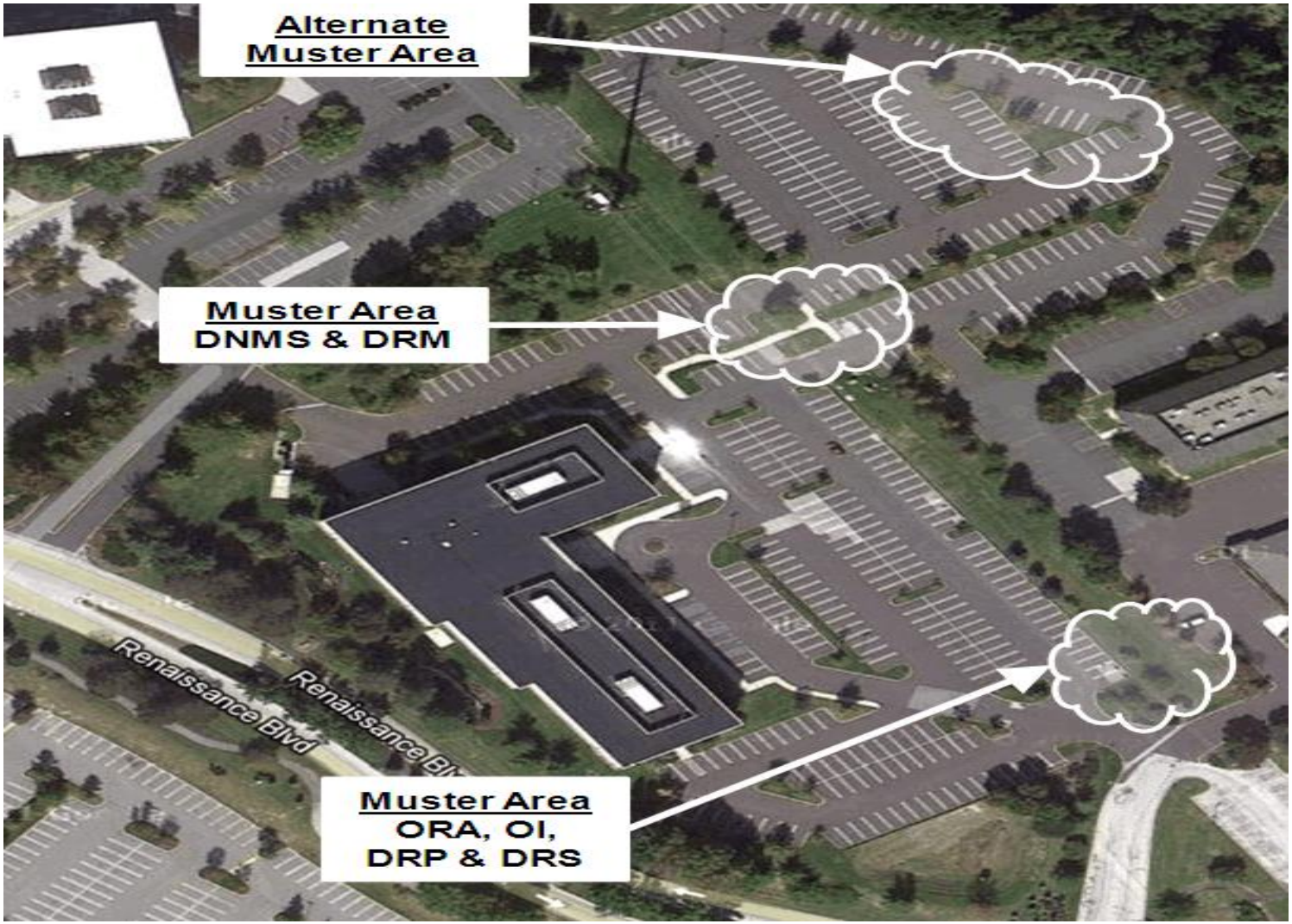
Muster areas during building evacuation



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Overview of Region I

- **Mission –** Inspect, assess and oversee the safety performance of 26 operating nuclear reactors, 16 ISFSIs, 4 nuclear reactors in SAFSTOR, over 900 material licensees, 1 Master Material License, and 9 complex decommissioning sites to ensure adequate protection of the public health and safety and the environment.
- **Who we are** –
  - 233 total staff in Region I (135 Qualified Inspectors)
- **What we do –**
  - Reactor Inspections (CY2012 - ROP 13)
    - Baseline Inspections - 116,000 hrs. of inspection and related activities
    - 5 Supplemental (3 – 95001 & 2 – 95002) and 1 Reactive Inspection
    - Responded to 7 declared events (6 UE's and 1 Alert)
  - Nuclear Materials Program
    - 320 Inspections and 580 Licensing Actions (FY2012)
    - Navy Master Material License (MML)
    - Oversight for Agreement States

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Region I Data
Number and Type of Licensees

- **16 Nuclear Reactor Sites (CT, MD, MA, NH, NJ, NY, PA, VT)**
  - 26 operating reactors
    - 13 PWRs (9 WH, 3 CE, 1 B&W)
    - 13 BWR (8 Mark-I and 5 Mark-2)
- **980 materials licensees** (DC, DE, CT, PR, VI, VT, WV) & Navy MML
- **16 ISFSIs**
  - 10 Inside Protected Area (PA)
  - 3 Outside PA (within OCA)
  - 3 Stand-alone
- **4 Nuclear Reactors in SAFSTOR**
- **Complex Decommissioning Activities**
  - 6 complex material sites
  - 3 Research / Test Reactors

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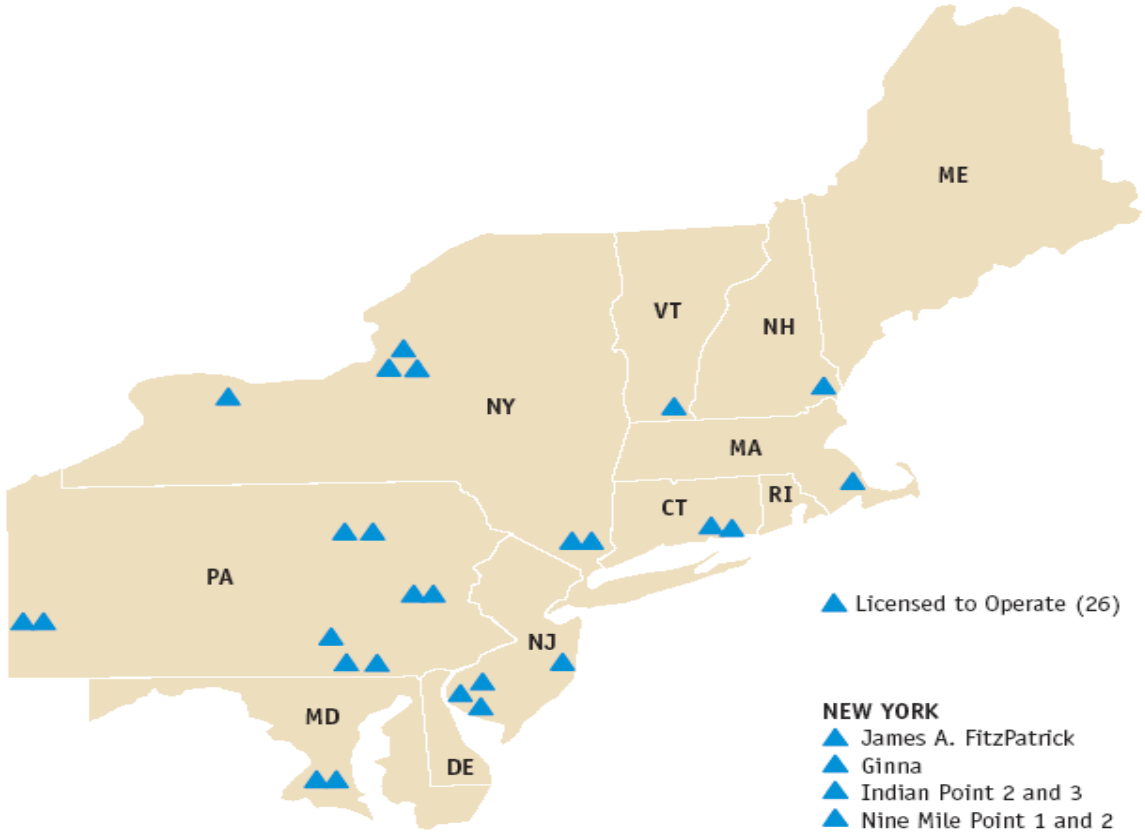
Reactor Safety
Where we regulate



▲ Licensed to Operate (26)

NEW YORK
- ▲ James A. FitzPatrick
- ▲ Ginna
- ▲ Indian Point 2 and 3
- ▲ Nine Mile Point 1 and 2

PENNSYLVANIA
- ▲ Beaver Valley 1 and 2
- ▲ Limerick 1 and 2
- ▲ Peach Bottom 2 and 3
- ▲ Susquehanna 1 and 2
- ▲ Three Mile Island 1

VERMONT
- ▲ Vermont Yankee

CONNECTICUT
- ▲ Millstone 2 and 3

MARYLAND
- ▲ Calvert Cliffs 1 and 2

MASSACHUSETTS
- ▲ Pilgrim 1

NEW HAMPSHIRE
- ▲ Seabrook 1

NEW JERSEY
- ▲ Hope Creek 1
- ▲ Oyster Creek
- ▲ Salem 1 and 2

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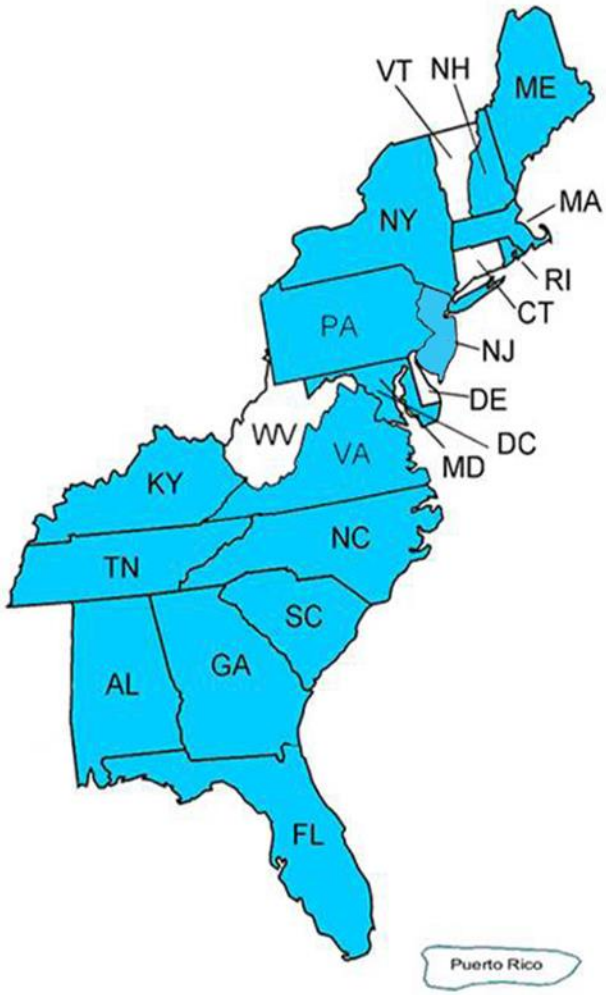
Materials Safety
Where we regulate



Agreement State

Non-Agreement State

* Materials Licenses are located throughout the North/South Eastern States, Puerto Rico and the Virgin Islands

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Unique Plant Transitions Impacting Region I Sites

- Crystal River – new decommissioning site
- Indian Point – timely renewal process
- Oyster Creek – Shutdown agreement with the State of New Jersey

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Fleet Overview and Reactor Oversight Process Performance Summary

July 24, 2013

Carey Bickett / Raymond Powell
Division of Reactor Projects
Region I

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Agenda

1. Action Matrix Summary

2. Substantive Cross Cutting Issues

3. Reactor Oversight Process Improvement Initiatives

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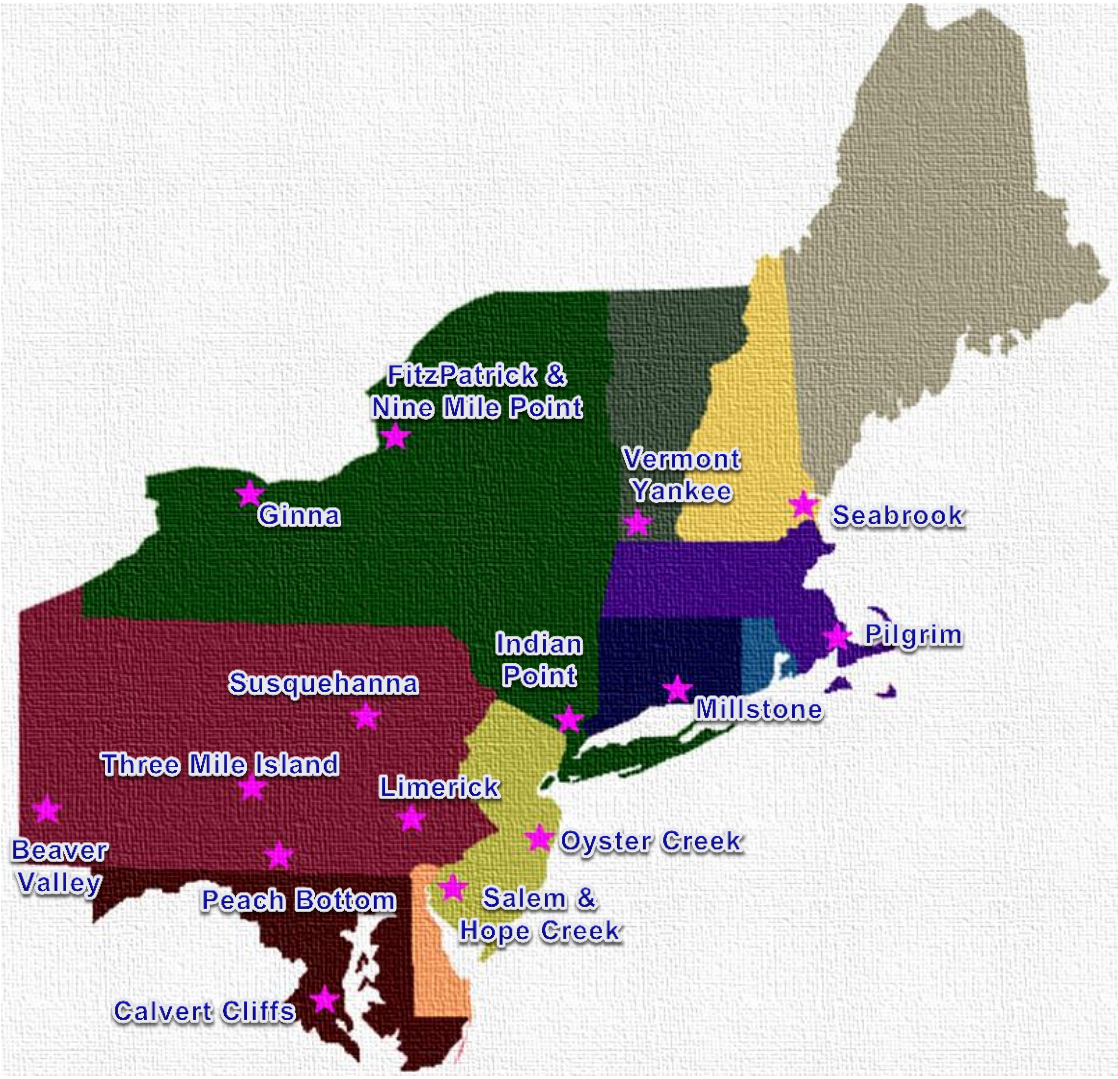
Region I Plants



Constellation: Calvert Cliffs, Ginna, Nine Mile Point

Dominion: Millstone

Entergy: FitzPatrick, Indian Point, Pilgrim, Vermont Yankee

Exelon: Limerick, Oyster Creek, Peach Bottom, Three Mile Island

FENOC: Beaver Valley

NextEra: Seabrook

PPL: Susquehanna

PSEG: Salem, Hope Creek

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Action Matrix Summary

as of 6/7/2013

Plant	Starting Quarter	Action Matrix Column and Input
Beaver Valley 1 & 2	3Q2012	Regulatory Response: One or more greater than green findings in the security cornerstone
FitzPatrick	4Q2012	Regulatory Response: White 'Unplanned Power Changes' performance indicator
Nine Mile Point 1	4Q2012	Regulatory Response: White 'Unplanned Scrams' performance indicator
Susquehanna 2	4Q2012	Regulatory Response: White 'Unplanned Scrams with Complications' performance indicator
Three Mile Island	4Q2012	Regulatory Response: White finding (external flood barrier deficiency)

All other Region I plants are in the Licensee Response Column.

Substantive Cross-Cutting Issues

as of the 2012 End-of-Cycle Assessment

Susquehanna

- Closed: H.2(c) – Procedure Adequacy (*opened at 2011 End-of-Cycle Assessment*)
- Maintained: P.1(c) – Problem Evaluation (*opened at the 2011 Mid-Cycle Assessment*)
  - Exit criteria not met. There was not a notable reduction in findings with this aspect and corrective action plans associated with monitoring progress were not effectively implemented.

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Components of the Reactor Oversight Process Internal Assessment

Ongoing Feedback (IMC 0801)

- Individuals (inspector, inspection procedure owner, subject matter expert) via feedback process
- Collectives (working groups, subject matter experts) via interface meetings

Annual Review (IMC 0307)

- Reactor Oversight Process self-assessment
- Biennial internal survey

Biennial Review (IMC 0307B)

- Reactor Oversight Process realignment

FY 2013 Enhancement Project

- In lieu of Reactor Oversight Process realignment

FY 2013 Independent Assessment (SECY 12-0081)

- Will inform the Reactor Oversight Process Enhancement Project

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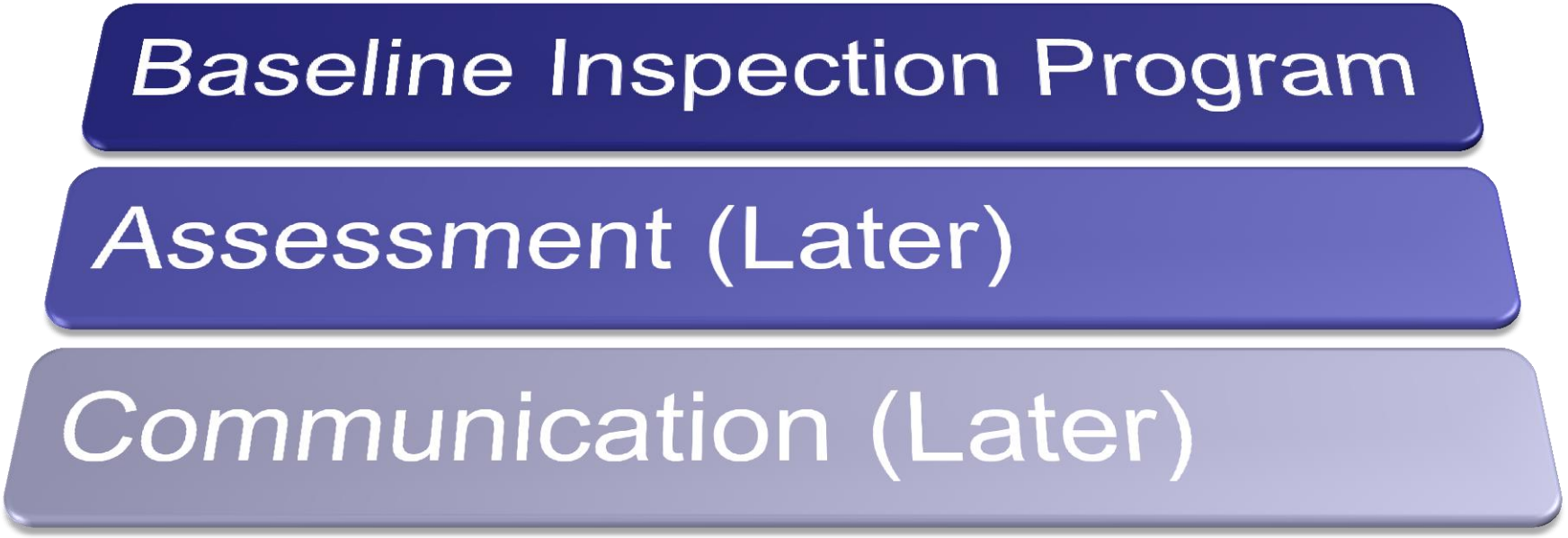
Components of the ROP Enhancement Project



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Project Goal

Enhance the baseline inspection program

- Incorporate needed inspection areas for the current environment
- Eliminate redundant inspection areas
- Ensure efficient and effective use of agency resources
- Incorporate flexibility where appropriate

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Deviations from the ROP
Seabrook Concrete Alkali-Silica Reaction (ASR) Condition

July 24, 2013

James Trapp, Branch Chief
Division of Reactor Safety
Region I

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Agenda

1. Issue
2. NRC Response
3. Future Activities

Indications of ASR

- Alkali-Silica Reaction (ASR) has been identified in localized areas of Seabrook concrete structures
- ASR is a chemical reaction in concrete, which occurs over time in the presence of water, between the alkaline cement and reactive silica found in some aggregates.
- ASR forms a gel that expands causing micro-cracks that effect concrete material properties

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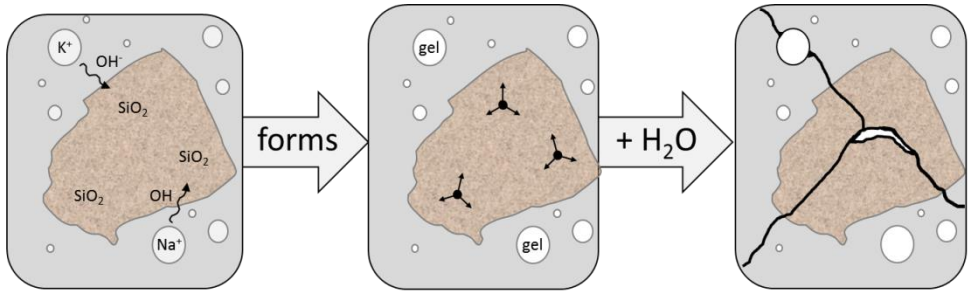
Issue

Process:

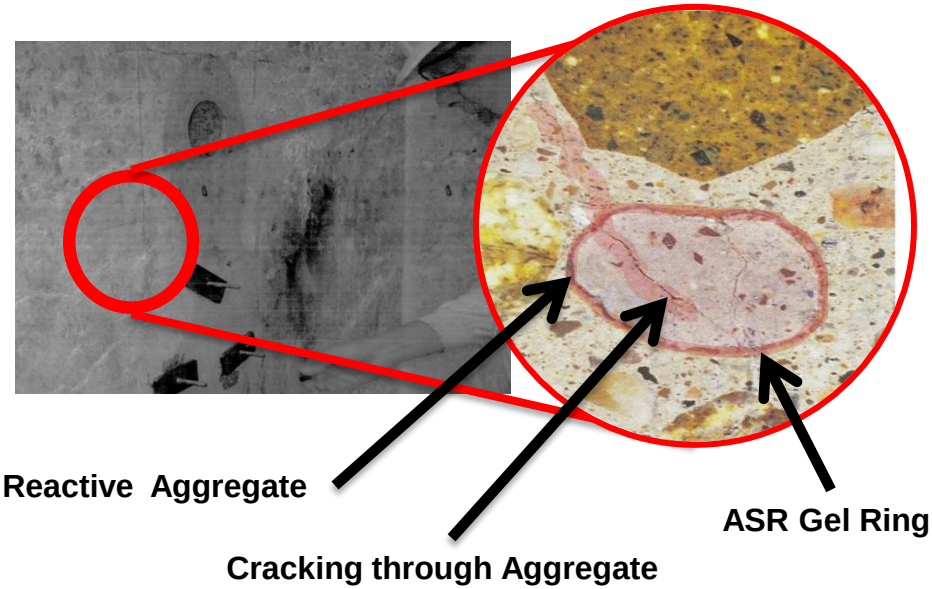


alkali (in cement) reacts with silica (in aggregate) and water

silica gel forms

cracking occurs as gel expands

Appearance:



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NRC Actions

- Information Notice (IN 2011-20)
- Confirmatory Action Letter (CAL 1-2012-002)
  - Including two follow-up inspection reports
- ROP Deviation Memo
- Task Force and Charter
- Two Public Meetings
- Webinar with Press
- Public ASR Website

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Future Activities

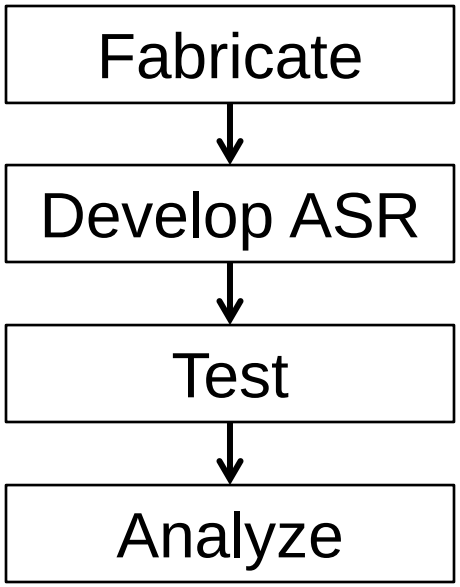
- Issue the second CAL Follow-up Inspection Report
- CAL and Deviation Memo Closure Letters
- Conduct Public Meeting
- Continued monitoring of ASR activities at Seabrook Station via PI&R Samples
- Oversight of ASR Test Program at University of Texas at Austin

Testing at UT-Austin

Purpose: To determine the effects of ASR on reinforced concrete performance using samples representative of the Seabrook structures.

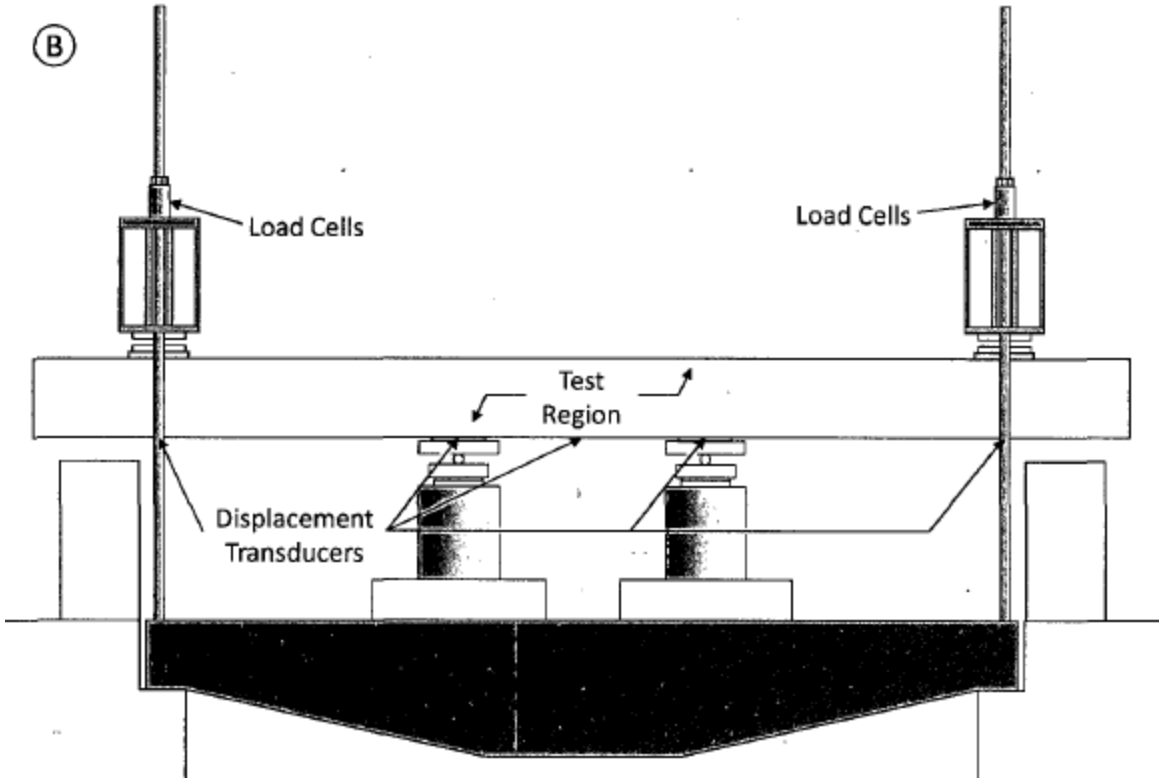
Test Programs:

1) Anchor Bolts
2) Lap-splice
3) Shear



Future Activities

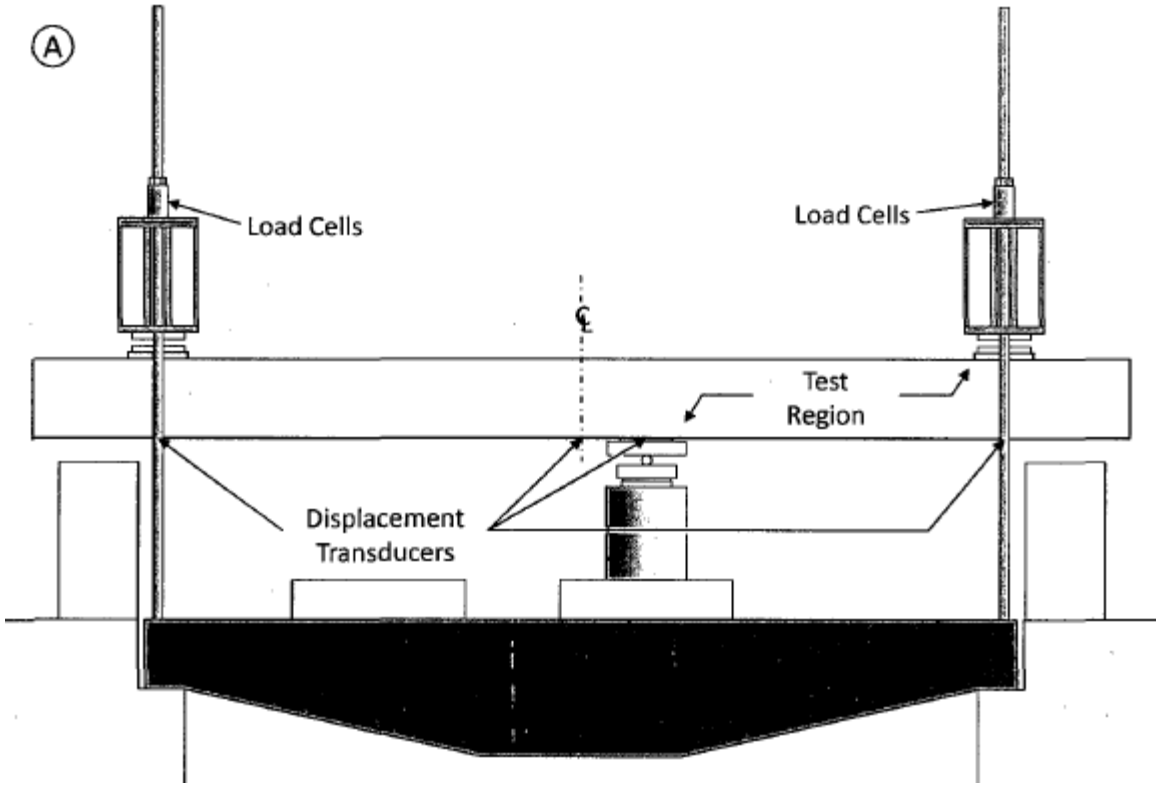
Test: Lap-splice Performance



Test: Lap-splice Performance

Future Activities

Test: Shear Performance



Test: Shear Performance

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Status of Follow-up Flood and Seismic Walkdown Audits of Region I Plants

July 24, 2013

Chris Cahill, PE
Senior Reactor Analyst
Division of Reactor Safety
Region 1

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TI 187 and 188 Objectives

- Verify licensee's seismic and external flood protection walkdown activities.

- These walkdowns were performed at all sites in response to a Request for Information as part of the lessons learned from the Fukushima accident.

- All RI inspections were completed and documented in the fourth quarter 2012 reports.

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Inspections

- NRC issues from the reports include:
  - Millstone Unit 2 – Unresolved Item associated with unsealed penetrations in the Unit 2 turbine and auxiliary buildings.
  - Three Mile Island – Green Non Cited Violation for the failure to identify and correct unsealed penetrations through the Intake Screen and Pump House.
  - Three Mile Island – White corrective action violation for Exelon's failure to identify and correct that electrical cable conduits were not flood sealed in the air intake tunnel as designed.

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Follow-up Audits

- Performed to gain a better understanding of the licensee's methods and procedures in conducting the walkdowns and to assist in the review of the walkdown reports.

- Factors in choosing the sites to audit were:
  - Lack of clarity as to how the walkdown was consistent with the guidance based on the review of the walkdown report.
  - Plant specific areas of interest identified during review of the walkdown report.
  - Feedback and information gained during performance of regional inspections (e.g., Temporary Instruction *2515/187).*

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Selected RI Audits Sites

- Flood protection audits:
  - Salem 1&2 and Hope Creek (on-site June 25-27)
  - Millstone (Week of July 15)
  - Vermont Yankee (Week of July 15)
  - Oyster Creek (Week of July 22)

- Seismic audits:
  - Beaver Valley (Week of July 22)
  - Seabrook (Week of July 29)

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Three Mile Island - 1
TI-187 Inspection Results

July 24, 2013

Justin Heinly / David Werkheiser
TMI Resident Inspectors
Division of Reactor Projects
Region 1

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Inspection Scope / Results

- In August 2012, TMI resident inspectors conducted post-Fukushima flooding walkdowns. The inspectors' sample included the conduct of both independent and accompanied walkdowns.

- During an independent walkdown of the Intake Screen and Pump House (River Intake), the inspectors identified 13+ unsealed penetrations on motor baseplates.

- During an accompanied walkdown with the licensee of the Air Intake Tunnel (Air Intake), the inspectors identified the lack of seals in 43 cable conduits.

- The issues, and associated violations, are documented in NRC inspection reports:

  - ✓ 05-289/2012005 (February 11, 2013), ML13042A277
  - ✓ 05-289/2012005 (April 4, 2013), M13094A219
  - ✓ 05-289/2013009 (April 30, 2013), M13120A040

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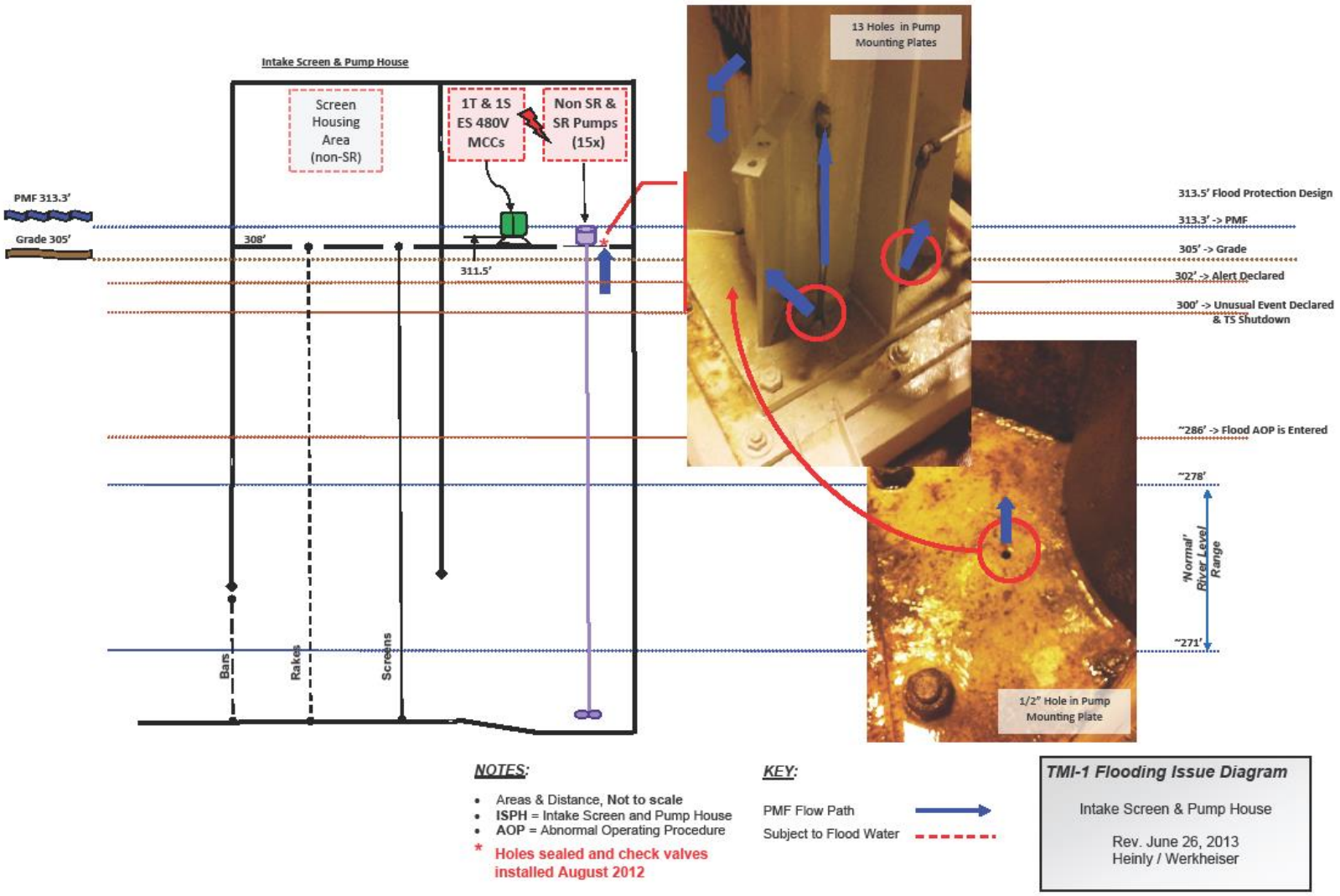
River Intake Motor Baseplate Holes



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River Intake Motor Baseplate Holes

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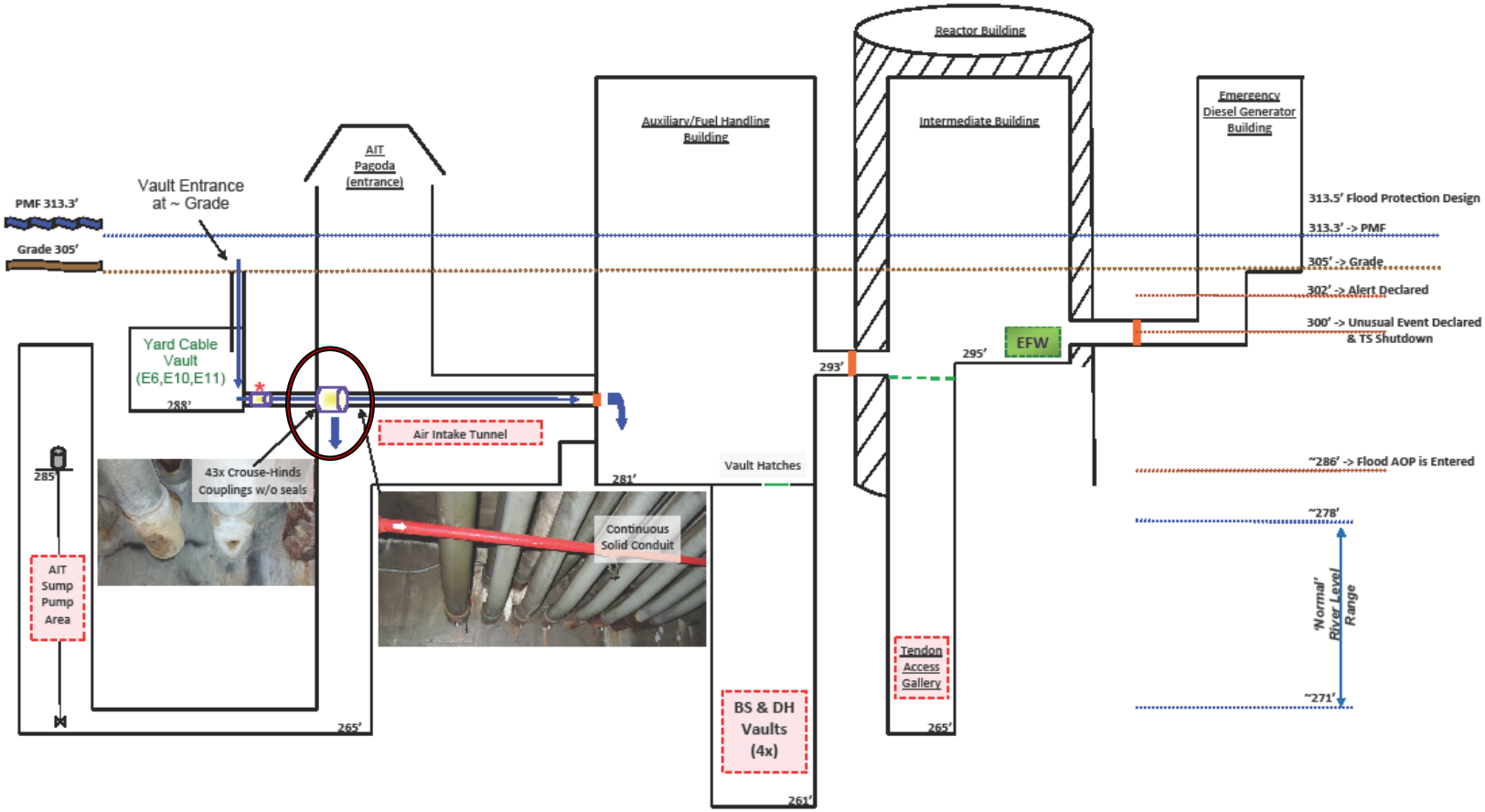
Air Intake Missing Conduit Seals



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Air Intake Missing Conduit Seals

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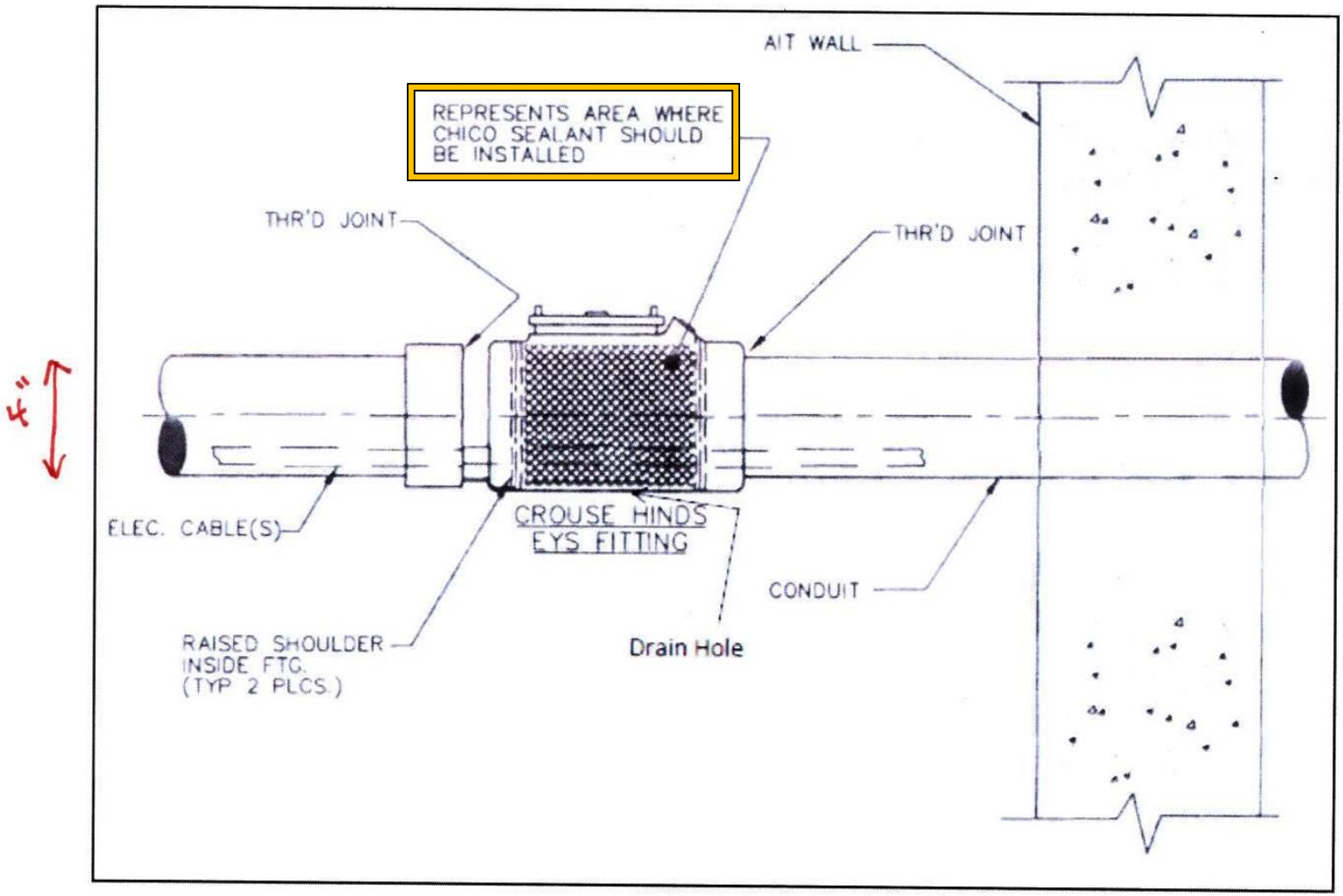
Air Intake Missing Conduit Seals



Air Intake Missing Conduit Seals

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Outcome / Info Sharing

❖ Inspection Outcome / Licensee Corrective Actions:

River water intake violation – NCV (Green) of 10CFR50, App B, Criterion 16 (Corrective Actions) for failure to identify and correct.

- Licensee sealed baseplate penetrations and installed check valves in pump cavity drains.

Air intake violation – NOV (White) of 10CFR50, App B, Criterion 16 (Corrective Actions) for failure to identify and correct.

- Licensee sealed conduits up stream at the cable vault. Other programmatic actions as a result of root cause evaluation (e.g. evaluation of 'inaccessible' features)

❖ NRC Information Sharing:

✓ Article published in NRC-wide Inspector Newsletter, (April 2013)

✓ Presentation at Region 1 Inspector Seminar, (June 2013)

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Region I Participation in State of the Art Consequence Analysis (SOARCA) and Spent Fuel Pool Scoping Safety Study

July 24, 2013

Chris Cahill, PE
Senior Reactor Analyst
Division of Reactor Safety
Region 1

SOARCA Mitigation Measures Analysis

RI participated in the evaluation of reactor mitigation measures.

These measures included:

- Emergency Operating Procedures (EOPs)
- Severe Accident Management Guidelines (SAMGs)
- Specific mitigation measures
- In addition, the team completed table-top exercises of the selected scenarios to glean insights into operator actions for implementation of the available mitigation measures.

Spent Fuel Pool Scoping Study

RI participated in the evaluation of spent fuel pool mitigation measures:

- Detecting SFP leak
- Diagnosis and response planning
  - Determine the use of FLEX equipment
- Action – Either inject or spray water into SFP
- In addition, the team completed table-top exercises of the selected scenarios to glean insights into operator actions for implementation of the available mitigation measures.

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Region I Fire Topics

July 24, 2013

John Rogge
Division of Reactor Safety
Region I

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Agenda

1. Overview
2. NFPA 805 Transition Status
3. Multiple Spurious Operations
4. Indian Point – Single Spurious

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Overview

- 15 plants are pre-79
- 9 plants are post-79
- 6 plants are in transition to NFPA 805

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NFPA 805 Transition Status

- NMP 1 – LAR submitted 6/11/12
- NMP2 – Withdrawn
- Ginna – LAR submitted 3/28/2013
- Calvert Cliffs – LAR scheduled 9/30/13
- Beaver Valley – LAR scheduled 12/31/13

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NFPA 805 Transition Status

- Enforcement Discretion

- 15 violations have been dispositioned using enforcement discretion since commitment to transition to NFPA 805

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MSO – Multiple Spurious Operation

- All plants have addressed the issue except for those in transition to NFPA 805 and Indian Point.

- Region I inspects the results during the Fire Inspection Triennial Teams.

- We have found no issues to date.

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Single Spurious – Indian Point

- As part of resolution plants were required to identify and resolve the non compliances.

- Approval and Exemptions were needed if cables and equipment were protected by the use of Operator Manual Actions.

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Single Spurious – Indian Point

- Many Exemptions were denied.
  - Time Margin
  - Defense in Depth

- Upon Inspection, one Unit 3 requested Exemption was found to be not feasible.

- Resolution will also address MSO issue.

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Regional Response to Hurricanes and Storm Events

July 24, 2013

Ray McKinley
Senior Emergency Response Coordinator
Division of Reactor Safety
Region I

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Agenda

1. Hurricane Response Procedure
2. Experience with Hurricane Sandy
3. 2013 Forecast

IRP-091001, “Hurricane Response”

Preparation activities begin 120 hours from landfall and escalate as the storm approaches:

- Tracking storm progress
- Briefing NRC management and staff
- Dispatching additional inspectors
- NRC Incident Response posture decision making

IRP-091001, “Hurricane Response”

Response activities intensify 24 hours before impact through storm passage:

- NRC Incident Response posture decision-making
- Monitoring NRC licensee preparations and storm impacts at NRC licensed facilities
- Coordinating with FEMA and affected states relative to infrastructure damage and reasonable assurance of protective action implementation

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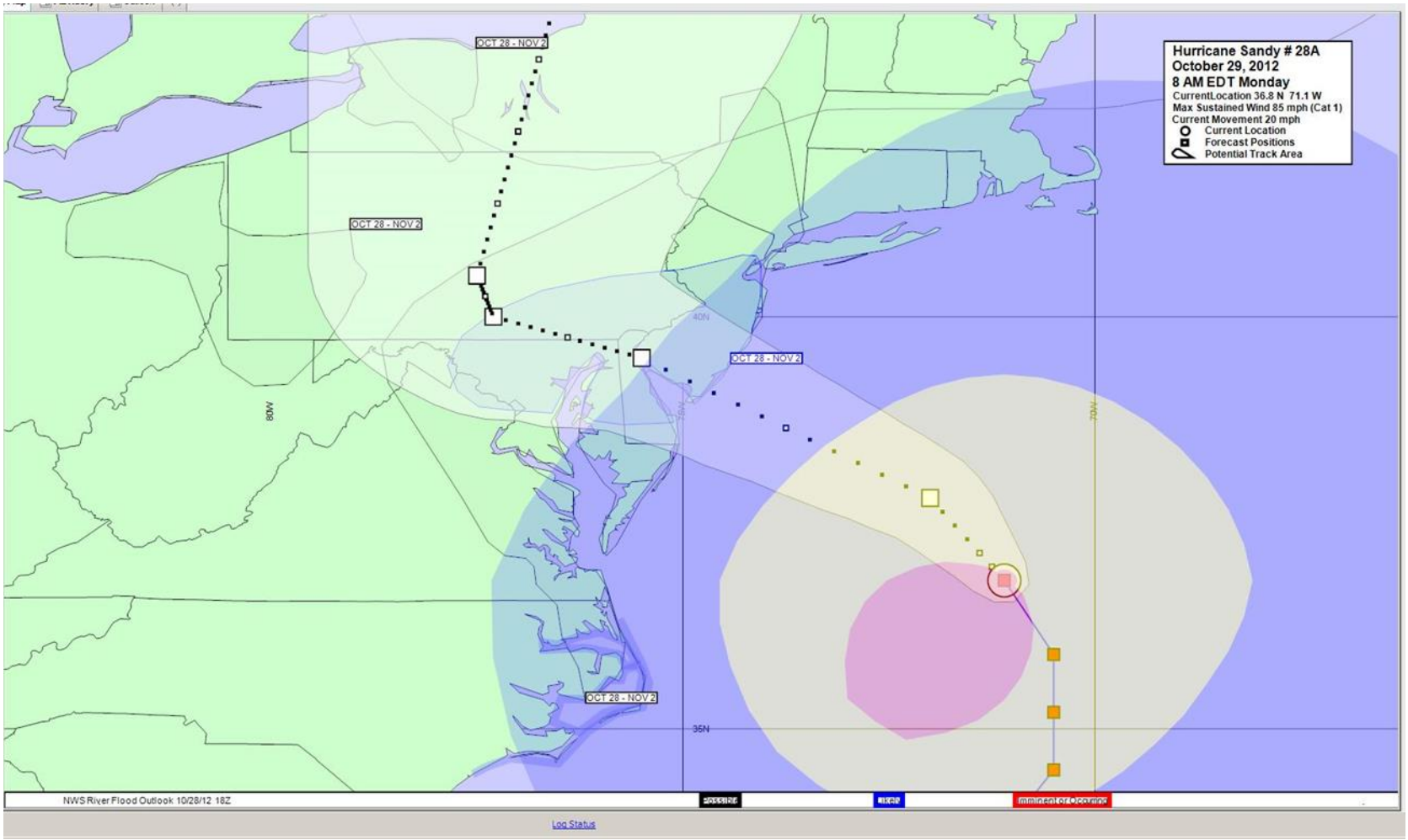
Hurricane Sandy



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Hurricane Sandy Effects

- NRC executed portions of the Continuity of Operations Plan as the storm impacted the HQ and Region I offices.
- Plant impacts:
  - Oyster Creek Alert declared due to intake water level.
  - Salem 1 manually shutdown when 4 of 6 circulating water pumps tripped due to intake debris.
  - Nine Mile Point 1 and Indian Point 3 automatically shutdown in response to grid disturbances.

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2013 Hurricane Forecast

	Average Year	2012 Actual	2013 Forecast
Named Storms	12.1	19	15 to 18
Hurricanes 74 to 110 mph	6.4	10	8 to 11
Major Hurricanes > 110 mph Cat 3 and above	2.7	2	3 to 6

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Hurricane Sandy

July 24, 2013

Amar Patel (RI)
Division of Reactor Projects
Region I (Oyster Creek)

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Timeline

- 10/29
  - 6:55 pm - **Unusual Event** declared (>4.5 ft) > 4.65 ft
  - 8:18 pm - **Loss of Offsite Power** occurred
  - 8:44 pm - **Alert** declared (>6 ft) – Intake level 6.25 ft and rising
- 10/30
  - 12:18 am - **highest level** during storm – 7.4 ft
- 10/31
  - 3:52 am - Offsite Power restored and Alert terminated

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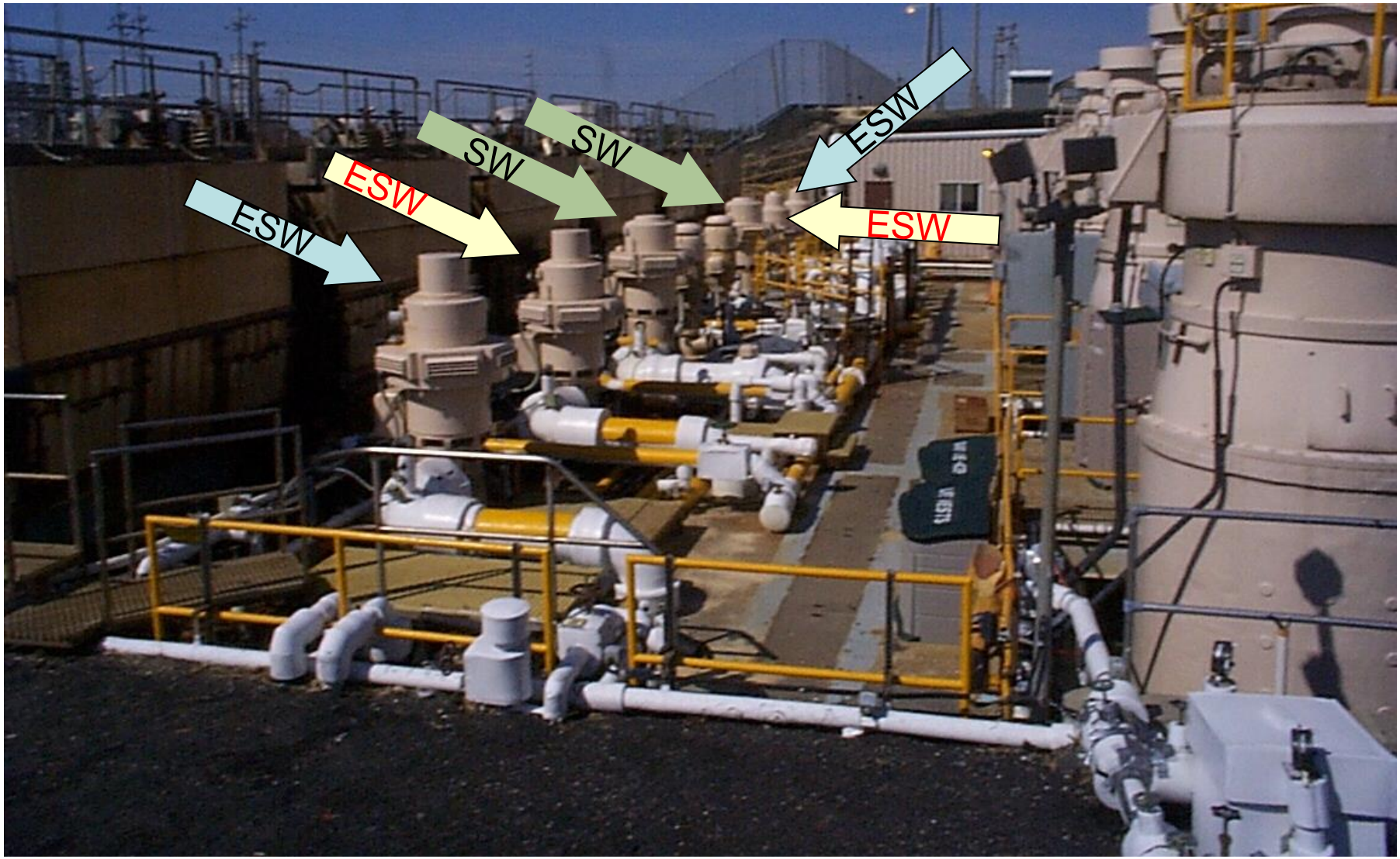
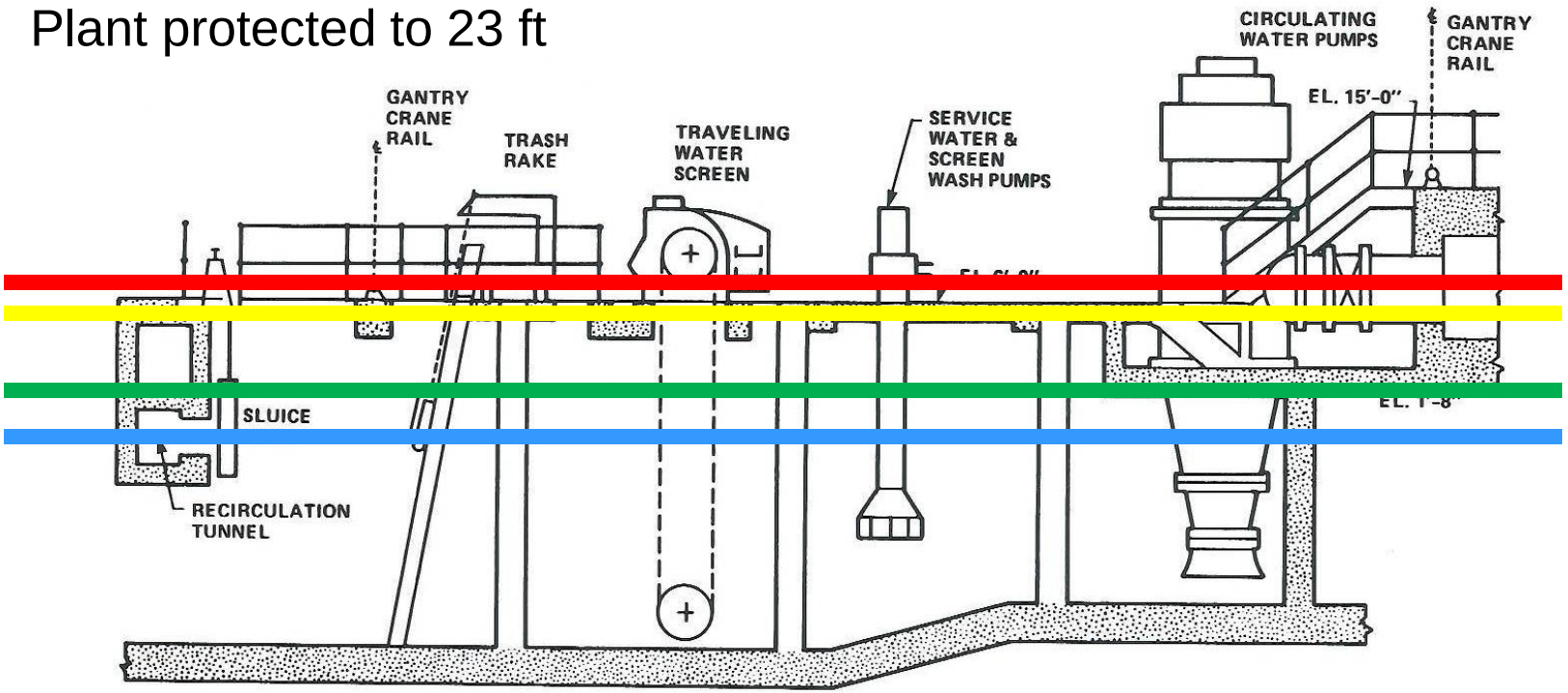
Service Water System



Flooding of Intake

- Normal water level ~ 0 ft
- 6:55 pm Unusual Event declared (>4.5 ft) > 4.65 ft
- 8:44 pm Alert declared (>6 ft) – intake level 6.25 ft and rising
- 12:18 pm the highest level during Sandy – 7.4 ft
- Impact to service water pump motor - 10.3 ft
- 1962 highest level reached before Sandy – 4.5 ft
- Plant protected to 23 ft



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Service Water Pump

- 10.3 ft – Impact to Motors
- 7.4 ft

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Normal Intake Level

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Intake Picture during Storm

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Initiating Event for LOOP

Inspection Results

- Special Inspection conducted
- Results – licensee response was acceptable and no findings of significance were identified
- Documented in inspection report 05000219/2012009 **ML13010A470**

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Region I Materials Oversight of Reactor Activities & Issues

July 24, 2013

Marc S. Ferdas
Division of Nuclear Materials Safety
Region 1

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Agenda

- Decommissioning of Crystal River 3

- Indian Point Inter-Unit Wet Fuel Transfer

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Decommissioning of Crystal River 3

- On February 20, 2013, Duke Energy certified that fuel has been permanently removed from the vessel and no longer authorized to operate the reactor.
- Licensee plans to place the plant in SAFSTOR status.
- NRC oversight governed by Inspection Manual Chapter 2561, “Decommissioning Power Reactor Inspection Program.”
- NRC oversight responsibility in the process of being transferred from Region 2 to Region 1.
- HQ working group established to enhance inspection program guidance and procedures.

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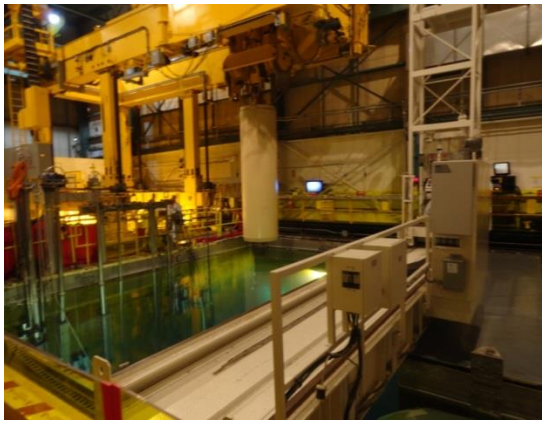
Indian Point
Inter-Unit Wet Fuel Transfer

- Unique evolution approved by NRC under Part 50 license amendment in July 2012.
- Consists of the wet transfer of 12 spent fuel assemblies at a time from U3 to U2 using a HOLTEC designed system.
- 16 inter-unit wet fuel transfers have been completed to date.
- Oversight performed based on Region 1 developed NRC Inspection Procedure 60845, “Operation of Inter-Unit Fuel Transfer Canister & Cask System.”
- Extensive on-site inspections performed of licensee’s activities associated with pre-operational testing (dry-runs), initial transfer, and a selected transfer.

Indian Point
Inter-Unit Wet Fuel Transfer

Empty STC going into U3 spent fuel pool

HI-TRAC with loaded STC moved out of U3 on air pads



Loaded STC lowered into U2 spent fuel pool to be unloaded

VCT transporting HI-TRAC and loaded STC from U3 to U2

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Closing Remarks

July 24, 2013

Bill M. Dean
Office of Regional Administrator
Region I

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Areas of Focus Going Forward for Region I

- Ensuring continued plant safety
- Ensure completion of all actions related to events in Fukushima
-
- Continued engagement with stakeholders to communicate our key safety messages
- Maintain highly qualified staff with sequestration factors

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Questions