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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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UNITED STATES NUCLEAR REGULATORY COMMISSION'S
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

JUNE 14, 2000

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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MEETING: PLANT OPERATIONS AND FIRE PROTECTION

U.S.N.R.C., Region III

801 Warrenville Rcad

Lisle, IL

Wednesday, June 14, 2000

The committee met, pursuant to notice, at 8:30 a.m.

MEMBERS PRESENT:

DANA A. POWERS, Chairman

GEORGE APOSTOLAKIS, Vice-Chairman

JOHN J. BARTON

MARIO V. BONACA

ROBERT L. SEALE

JOHN D. SIEBER

GRAHAM B. WALLIS

P R O C E E D I N G S

[8:30 a.m.]

CHAIRMAN BARTON: Good morning. The meeting will now come to order. This is a meeting of the ACRS Subcommittees on Plant Operations and Fire Protection.

I am John Barton, Chairman of the Subcommittee on Plant Operations, and Jack Sieber is Chairman of the Fire Protection Subcommittee.

ACRS members in attendance are George Apostolakis, Dana Powers, Mario Bonaca, Robert Seale, Robert Uhrig, Jack Sieber, and Graham Wallis.

The purpose of this meeting is to discuss selective technical components of the plant operations and fire protection issues. The subcommittee will gather information, analyze relevant issues and facts, and formally proposed positions and actions, as appropriate, for deliberation by the full committee.

Jit Singh is the Cognizant ACRS Staff Engineer for this meeting.

The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register on May 24, 2000.

A transcript of the meeting is being kept and will be made available as stated in the Federal Register Notice.

It is requested that speakers first identify themselves and speak with sufficient clarity and volume so they can be readily heard.

We have received no written comments from members of the public.

We will now proceed with the meeting, and I call upon Mr. Jim Dyer to begin.

MR. DYER: Thank you, Mr. Barton. Good morning. Welcome to Region III. I'm Jim Dyer, I'm the Regional Administrator for the Regional Office. With me here today are Mr. Marc Dapas, who is the Deputy Director of the Division of Reactor Projects; Mr. Jack Grobe, who is the Division Director, Division of Reactor Safety; and, Mr. Jim Caldwell, who is Deputy Regional Administrator.

Also, throughout the day, we've scheduled an agenda, which copies are available for the public over by the coffee pot and as you come into the conference room, and the various members of the staff will be addressing the subcommittees today, based on the information we understand that you request, and if you want additional information, we're very flexible. We'll try to get anybody who is here on the staff to answer your questions or present anything in particular you wish to address.

I think, going to my first slide, a little background about Region III. This was the recent addition to the package, so we'll have copies made. But just Region III encompasses an eight-state area involving, on the reactor side, involves 16 operating sites, 24 operating reactors, and those are the people sitting at the table right now, particularly Mr. Grobe and Mr. Dapas, have the principal responsibilities for safety oversight in those areas.

We also have a Division of Nuclear Materials Safety and Division of Resource Management and Assessment.

Our reactors are relatively close to each other in the eight-state region and particularly in the State of Illinois, and it makes convenient travel from the Region III offices here in Lisle.

CHAIRMAN BARTON: Something that can't be said about travel to here.

MR. DYER: Yes. Just a little overview about the regional organization, and I can make some introductions of the folks, the staff.

What I really want to just focus on is the upper half of the chart we provided you here. For our presentation here, what we plan to do is I was going to go through the overall regional organization and then allow the division directors, particularly the Division of Reactor Safety and Division of Reactor Projects, to go into their more detailed reviews of their staffing and how we're organized to manage our safety responsibilities here in the region.

I guess, first of all, we are organized with four divisions, three technical divisions; that is Division of Resource Management, the Division of Nuclear Materials Safety, Cindy Pederson is out today, and we didn't plan on her participating. They do have some responsibility for the decommissioning reactors. So if you have any questions that go into that arena, we'll bring somebody down to discuss that with you.

Additionally, Mr. Grobe, Division of Reactor Safety, and in my oversight and role, the way I look at the way the region operates is somewhat of a matrix organization between DRS and DRP. I view the Division of Reactor Safety as the functional experts in the various areas. So their responsibilities are in the operations, engineering, plant support areas, radiological protection, fire protection, and that.

In those areas, they're responsible for looking at specific areas across all of our 16 operating reactor sites. So for the case of operator licensing, they're responsible for overviewing of the operator licensing and operations inspections, team inspections, and calibrating safety assessment at all 16 sites across that one functional area.

Then separately from that is the Division of

Reactor Projects, which is organized by reactor assignments to the various sites, under Mr. Dapas and Mr. Grant, and these are organized more in lines with projects.

They're our generalist inspectors and basically they are responsible for everything that goes on at that site. So within the region, if a particular event occurs or a particular issue comes up at a site, there should be two points of contact that have cognizance over that area.

One, the DRP point of contact from a generalist view, because it affects that site and you can integrate the impact of the assessment across all the functions at that site and put it in that proper context.

The second would be from the functional area review and taking a look at, from Mr. Grove's DRS point, how does this -- what are the lessons learned, how are we consistent across all of our 16 sites in the way we're treating that area.

So that's the general oversight of how the region is orchestrated and integrated. In particular, the key aspect of regional activities that establishes and identifies the issues we're going to follow up is at 8:15 every morning, we conduct a review of plant events and plant status. Normally, it's in this room. This morning it was taking place in our other conference room down the hall on the third floor.

But in that meeting, we will go through any reported events for the night and any emerging issues that come from the sites, from the resident inspectors, we bring them up and put them on the table and discuss what is our response going to be to those activities.

CHAIRMAN BARTON: So is this organizational structure you described pretty similar in all four regions?

MR. DYER: It's identical in all four regions. It's just my concept of operations, if you would, as to how they -- other regions may decide to do things differently. We all have morning meetings, but we all have some differences as to how we would approach a morning event or an emerging issues.

CHAIRMAN BARTON: Thank you.

MR. DYER: I think a little bit about the Regional Administrator staff; in particular, this is also similar to all the regions. Of most interest to you is probably our area of enforcement and allegations. If there are any questions that would come up regarding -- by the subcommittees today. Mr. Brent Clayton is here this morning and he is available, if you have any questions, or he is going to spend some time this morning and we'll bring him back or we'll get a member of his staff, if there are any questions about the allegations or the enforcement activities that we have going on here in the region.

Additionally, we also have an Office of Investigations, which is similar in all regions, a Public Affairs staff, and then a Regional State Liaison Officer. Mr. Roland Lickus had to take his son to a doctor's appointment this morning. He is going to come in a little bit later.

I think what is unique to Region III is our relationship with the Illinois Department of Nuclear Safety. I'm convinced there is no state that has the extent of nuclear oversight that the Illinois Department of Nuclear Safety has with their resident inspectors at all the six sites that are operating in Illinois and their extensive emergency planning and incident response capabilities.

If you care to discuss our relationship or how we interact with Illinois Department of Nuclear Safety, Roland is probably the best person to talk to with that.

Additionally, we have a regional counsel, who is in our -- spends a lot of his time involved with reactor enforcement cases, and particularly, now that recently we have had a lot of discrimination issues that have taken a lot of our time and have been a challenge.

So that's the basic overview of our organization here, from a regional administrator's level. I guess I would ask if there are any questions.

DR. POWERS: I guess one thing that has just emerged for the committee is we're anticipating getting a power upgrade application from Guianardo, rather substantial one. So any thoughts you have on that power upgrade that you think we ought to know about would be useful, if there is a chance during the day.

MR. DYER: Okay. You're going to have the senior reactor analysts later on the day and I know they may be more informed. I know Mike Parker was out there with Research and did some walk-downs.

DR. POWERS: I think we would be interested in thoughts about are there synergistic effects associated with going to power upgrades and high burn-up fuels in an aging plant. Things like that. It's the first of what we see of many rather substantial power upgrades. I hesitate to quote the exact amount, but it's about 15 percent power up rate, which would mean they're about 20 percent of what they had in the past.

MR. DYER: We can certainly comment on the impact that has on the inspection program. But the technical viability, NRR reviewers get involved.

DR. POWERS: Sure. And insights that you have that are peculiar to you that we would be most interested in.

MR. DYER: And Commonwealth Edison is also looking at what I consider to be rather substantial power up rates for both the Quad Cities and the Dresden stations.

DR. POWERS: I think there's going to be a covey of them coming in.

DR. SIEBER: Speaking of coveys. You've had the privilege or honor or whatever of not being involved in the first sub-group of license renewal activities and perhaps it would be more appropriate to address this question for Regions I or II, but I don see any of them here.

How do you anticipate a license renewal application would impact the regional activities?

MR. DYER: Quite frankly, I don't think it is going to impact. We'd love to have one. Right now, we don't have any takers. I think Commonwealth Edison is -- both Commonwealth Edison and the management company, which formed Duane Arnold, Monticello and that, are both talking about it, but --

DR. SIEBER: No one has committed yet.

MR. DYER: Nobody has committed and I think they're at least six months away from doing that. I know that we really haven't taken a look at that for license renewal.

MR. GROBE: We can talk in a little bit more detail when we get into the details of how my division operates.

MR. DAPAS: I think, in summary, though, it's probably relatively transparent to the new inspection program.

DR. SIEBER: I had one other question. Are any of the people out here representing the public as opposed to members of your staff?

MR. DYER: They are all our staff.

DR. SIEBER: Okay.

MR. DYER: All of which I believe may be giving you presentations later today.

DR. SIEBER: Okay. I was just curious.

MR. DYER: Okay. Next slide, please. Following up, I think that a few of the activities that we've recently completed or are in the process of completing that may provide some areas for later discussions, of course, is some of our more recent regional accomplishments.

We did implement the pilot program at both Quad Cities and Prairie Island. I think in particular, it was a unique relationship, particular with the Quad Cities sites, in that it involved integrating the Illinois Department of Nuclear Safety into this program.

We conducted the training here in this room, in fact, and brought all the Illinois Department of Nuclear Safety folks in to cross-train them. Secondly, Quad Cities had some unique performance indicator verification issues and it really opened up, I think for the industry and the

NRC, an understanding as to just how many different ways you can calculate performance indicators.

And as a result of that, Commonwealth Edison really took the lead, I believe, for the industry to solidify and come up with a common way of doing it.

I think Oliver Kingly, at our last review, made the comment that he says he never realized that they had seven different ways of calculating EFTY within the Commonwealth organization, and depending on which organization you asked, as to how much reactor burn they've done, they have a different way of calculating it.

So it was those kinds of things, and the same thing with how they recorded availability. It was interesting.

DR. POWERS: The NRC seems to have about seven different ways of calculating availability, depending on what rule you go to.

MR. DYER: We have transitioned to the new oversight program at all our sites, with the exception of D.C. Cook. I would like to add that while you were in transit yesterday, I signed the D.C. Cook 0350 closure letter. So D.C. Cook is -- the closeout has been done and now they're in the process of heating up and testing their systems in mode three and trying to wrestle with a problem with the turbine-driven aux feedwater pump this morning.

But they will be the final plant to transition after the restart of Unit 1, and that will be later this year.

CHAIRMAN BARTON: When do you see them fully under the new oversight process?

MR. DYER: Jack probably has the best -- I was asked that at the Commission meeting, and I would say about six months after startup.

MR. GROBE: One of the things that we have to consider is how effective the performance indicators are before we transition them back to the regular oversight program. That's been shut down for almost three years. So there is no valid performance indicator data, with the exception of maybe in the health physics and emergency planning areas.

So we'll be looking at the performance indicator data and turn the plant back to the routine inspection program as soon as we feel comfortable that the way the program is structured, we can effectively monitor the plant performance.

CHAIRMAN BARTON: Thank you.

MR. DYER: We completed our PPR reviews for the end of cycle on the pilot plants and also did some mid-cycle reviews for the other plants, just to get them going in. Of note, as a result of the review, we, believe, are the only region, and we have two yellow performance indicators within the region, Kewaunee, alert notification system and siren system is in a yellow status, and we completed the 95-002 inspection, which is the supplemental inspection at Kewaunee.

Additionally, Quad Cities, the HPCI system went into a yellow status because of availability on an auxiliary oil pump, and we can discuss those. We have not done any supplemental inspections or held the public meetings yet with respect to the Quad Cities plants. That was just a recent issue.

Again, implementing the revised enforcement process, and if there are any questions, Brent Clayton is available in that arena.

Some of the areas -- one of the areas that's been a major shift here in the region and a major focus is -- I don't know if you know of the RIT system, which is our cost accounting system, which is used as the basis to budget our resources. We have found that we have not been accurately recording our costs and things that we thought were going in one of the cost bins, such as follow-up inspections or plant assessment, were, in fact, going in a completely different bin, some of our SRA training time.

So we've wrestled with our cost accounting system and it's clear that under the new budget constraints and that, that we are going to have to become better managers of our resources and understand what our budget resources are and what the plans are that we're doing.

DR. SIEBER: Does that affect the licensee billing?

MR. DYER: It turns out that licensee billing was about the only thing we did right, as far as the inspection. We were very good with inspection reports, but there's a lot of non-direct costs. That would be plant assessments, follow-up on technical issues, things like that that we were getting coded to other administrative duties and things like that.

So it sort of skewed our model and didn't capture accurately what the costs of how the region did business, and we've subsequently gone back and cleaned it up. So hopefully for the rest of this fiscal year, we should.

But fee billing was it -- the inspection efforts, the direct inspection, as well as prep and doc for the inspection reports was pretty much -- that was done well.

DR. SIEBER: Is it fair to say that the net effect of all of this was to tend to put more time or more pressure on the administrative rather than the programmatic side?

MR. DYER: Yes. The real impact was on -- we receive resources for plant assessment. By and large, those were under-billed, those resources, and administrative was over-billed.

DR. SIEBER: That can be embarrassing in the long run.

MR. DYER: As you'll find out later on, we've had -- when I first got here a year and a half ago, we had, I believe, six plants that were receiving enhanced oversight under 0350. Every one of the managers at this table was overseeing either Commonwealth Edison or at least one or two of the facilities that were preparing to restart.

And when the budgets -- and the staff was similarly supporting all those activities. And when the cost data came back and we were budgeted six and a half FTE for plant assessment, and we spent two and a half, which just didn't make sense.

So we knew something was up. Everybody was spending all their time in 0350 panels and oversight and when the cost data -- that's when we started looking as to why we did it and what it was was we had some old cost codes that we had been using for years and they were translating to some sort of different -- so it's caused a -- it's been a rather substantial effort.

Again, we made also a focus on improving our communications, enhancing them, particularly to get the implementation of the new oversight program. There's more rumors flying around about the program, as any time you go through a significant change.

We've held monthly meetings, enhanced meetings, with the divisions and have done some very good training. I think it's paying off now. I think the folks at the working level that are actually leading the change and the transition and they are the ones that have the best concept of what's going on at the plants.

CHAIRMAN BARTON: I want to ask you a question.

MR. DYER: Sure.

CHAIRMAN BARTON: Regarding that. If I were a "good plant" in this region, as defined by you folk, now under the new oversight program, with the baseline inspection program, would I be receiving more or less inspection hours?

MR. DYER: Absolutely more. I have a slide. I can diverge from that, if you want to.

CHAIRMAN BARTON: We just heard that yesterday loud and clear as a complaint. So we wondered whether it was true or whether we were just hearing a story.

MR. GROBE: We are going to talk about that specific aspect in some more detail.

CHAIRMAN BARTON: Okay. Good.

DR. POWERS: The question has some things to it in that it may be true now, but it is going to be true once you're in a more steady-state on the inspection program.

MR. DYER: Right. We are probably the extreme region for that concept, but --

MR. GROBE: The reason for that is that under the old program, we had some flexibilities, and we'll get into that in detail. We had a number of problem plants and I don't remember the total numbers, but it was upward, over a period of years, 20,000 inspection hours at D.C. Cook, similar at Clinton and other sites.

So a plant like Davis-Besse, which was one of our better performers, under the flexibility of the old program, got significantly fewer hours.

The baseline, the risk-informed baseline is intended to establish not a ceiling, but a floor, and that floor is higher than what Davis-Besse got in the past.

MR. DAPAS: And we'll explain why there was that flexibility under the old program and relative to the new program.

DR. POWERS: I mean, I guess the question that comes to mind is why shouldn't there be that flexibility. I mean, if you're going to have problem plants, and you are on occasion going to have those, why shouldn't you put your resources where the squeaky wheel is and let the guys that are doing a pretty good job --

MR. DYER: Well, I think it's a little more complex than that. We're going to get into it. We have about an hour set aside for this.

And let me just close out. Part of the issue is that -- I'm quite pleased and, Jack, you couldn't wipe the smile off his face, but the fact that yesterday was the final closeout of our 0350 process and our formal restart 0350 process for D.C. Cook is -- that has been a -- that is a significant impact on the region and that's the final one.

As I said when I got here, we were doing it with LaSalle, Quad Cities had just started up, we had Clinton, we had Cook, Peach Bottom, Point Beach wasn't that far away from restart. So there was a number of -- we have literally been focusing from plant to plant.

And last year at this time, the great fear was that if Clinton kept delaying and LaSalle kept moving their schedule up, it looked like both of them were going to restart within a week of each other. They subsequently restarted about a month apart. So that was a great relief, because a region literally cannot handle two restarts simultaneously of problem plants coming up.

So now we're poised to do the D.C. Cook restart and we are getting resources from all the other regions in order to support the final closeout of the inspections, as well as the actual startup.

CHAIRMAN BARTON: But with Cook coming back, that will only help the stability question in this area.

MR. DYER: I believe it actually helps more the northeast, because it's the tie lines. When Commonwealth Edison came back, Chicago was flush and the last time I talked to Oliver Kingsley, it looks like they could actually have excess power. What they want to do is it get to the northeast, where there's a need for power, and the tie has been right there at D.C. Cook. They have been able to route power through that intertie out of the main grid.

So they've actually been wheeling power south and then back up.

DR. SIEBER: Or it would go through Canada.

MR. DYER: Right.

DR. SIEBER: To what extent does headquarters hold the region accountable when a plant -- I'll speak louder. To what extent does headquarters hold the region responsible or accountable if a plant emerges as a problem plant?

MR. DYER: Well, you have to take a look at how did it occur and it's more you do a root cause analysis, if it's caused by an event; you know, should we have found it earlier, and done that.

I don't think it's any kind of fingerpointing or blaming as a result of that, but it always causes you to reflect. And I can say it's not only just the region that has the problem plant.

When the Commonwealth Edison problems came up and the Cook problems came up, and Millstone, even when I was in Region IV as Deputy Regional Administrator, we were all looking could that happen here. It's a general --

DR. SIEBER: Do you think the oversight process will help you identify precursors to problem plant issues more so than the old inspection program?

MR. DYER: I don't that the oversight process will help the NRC identify it. I think the deregulation is going to force the commercial nuclear industry to take a greater role in fixing, and the cost, the main cost in production, those areas, the pressures that they now feel are far more than what the NRC used to put on them.

They have to be a much more demanding manager now of their plants in order to accomplish the shorter outages, in order to bless the less than one reactor trip per year, on an average now, in the industry.

That's not NRC-driven. That's economics-driven, in my mind. And no matter how much I, as a regulator, challenge the licensee to improve performance, it's going to cost them a couple hundred thousand dollars a day now when a plant goes off-line, that's making the difference.

So I think our critical focus is shifting to make sure that they follow the prescribed processes and that they're playing by the rules, if you would; that when a system is inoperable, they declare inoperable and do the right thing, as opposed to how are they fixing it. That's the emphasis.

MR. GROBE: The new inspection program is more indicative than it is predictive and that's one of the concerns that we have in how we implement this, to retain the ability to identify the early precursors of more significant problems.

We're going to get into that in a lot of detail with lessons learned on the new inspection program to date.

DR. POWERS: And if you find routes to prediction under the new inspection program, we're going to be real interested, because it really is an indicative program.

DR. SIEBER: One more short question. With all the emphasis on cost-cutting and economical production, do you see things like the plant material condition going up or down, or programs being eliminated or consolidated to the detriment of the whole program, or other issues that are not being attended to that otherwise, in a more generous economic situation, might be attended to?

MR. DYER: I guess from my perspective, I've seen an investment in the plant. The thought of looking at extending the life cycle, the prospects of doing that and whatever they run, they've got to run well. Those are the key things that we've seen.

Particularly, what we saw was a total focus, I believe, from some of our plants is when they were shut down under the 0350 process and trying to get restart, they took a focus away from operations and they were focused on getting the plant fixed, whether it was reconstituting the design basis, modifying the plant to fix a long-term problem, or doing whatever is necessary to get their procedures and infrastructure effective.

There had been a lack of focus on maintaining the operating crews and maintaining the plant in an operating status net. So now that we've seen the plants once they start up, there has been a shift toward that operational safety focus, an increase in number of licensed operators.

In Region III, and I think Jack probably has a better handle on the budget numbers than I do, but I think we were looking at typically we were running between 30 and 50 exams a year and once Cook, Clinton and ComEd got up and running, in the past year and a half, two years, there now -- our number of licenses are upwards of 160, demand for us to give 160 licenses.

So it's literally tripled our workload in a short period of time. That's put a pressure on the region to get a lot of qualified license examiners and borrow them from headquarters and management, which is what Jack has done, but that kind of a ramp rate, if you would, has put a severe strain on the regional resources for that program.

But that's what we're seeing now, is an enhanced focus on operations and an investment in the plant. So I think almost all the plants are --

DR. POWERS: I was just going to comment in response to your question about material condition. I think under the new program, when you look at unavailability, performance indicators, if the licensees are maintaining a material condition, you would expect to see that manifested in transients caused by equipment problems and challenges to the operator.

So I think the new program has carved out a role of ensuring that material condition is being maintained or at least flagging to us that there are problems in that area, and then we would go in and look at the licensees' root cause evaluation and corrective actions as part of our supplemental inspection of a particular performance indicator threshold, for like system unavailability.

MR. GROBE: Jim and Marc are focusing primarily on reactor operations and those issues that directly make money. In some of the peripheries, we've seen some problems; for example, in the security and safeguards area. Commonwealth Edison substantially changed their approach to event response and protecting the plant from a physical threat and we just recently completed what is referred to our OSRE, operational safety response evaluation, at Quad

Cities and they performed poorly.

They changed the strategy also at LaSalle and Braidwood, significantly reducing the number of armed responders, for example. And we have exercises there later this month.

DR. SIEBER: So that was an issue involving the security organization as opposed to operation involvement in security.

MR. GROBE: And I think Jim's point on the financial demands is really key. Those things that can produce power and ensure equipment reliability are getting a lot of attention.

DR. POWERS: I think we can say the same thing in fire protection, because it doesn't generate kilowatts, it may be getting less attention than some of the other things, as well.

DR. SEALE: Not very well.

DR. SIEBER: Well, this is apparent or has been apparent for some years. I've worked with LaSalle for a couple of years and they had a lot of fire protection work orders that had aged substantially and I see the same thing on division valves at other sites and people say, well, as long as the valve is open, we're okay, but if you rupture the main, you may put the your whole system out, because you can't isolate.

So I think that that often needs attention, because it somehow jumps outside the risk-significant portions of the plant, which are the CAT-1, structures, systems and components.

MR. DYER: One other, on the same spin, I was just thinking, you know, in the case of Clinton, was one of the plants that was really run on a shoestring. It was a single unit utility. I think we have seen a significant commitment of resources and improvement and a change over there, particularly since Amergen took over and purchased the site, and it was shortly thereafter that they came out with a business plan that included looking at license renewal as opposed to the mentality when it was Illinois Power, which was get the plant restarted itself.

So it was do what was necessary to restart the plant, which it did not include training new operators.

DR. WALLIS: Do you find that consolidation of plants under single owners is helpful then, in general?

MR. DYER: We've had limited experience with that. The Amergen is the first one under, and now the management company is just trying to formulate and they really haven't had an impact yet.

Commonwealth Edison, we've had a seesaw relationship with over the years. Right now, it's riding a wave up and it's doing better. So I'm waiting to see.

MR. CALDWELL: I think the real answer to your question, though, is it's going to be case specific. I don't think you can make a generic statement about how deregulation is going to affect all the plants. The single-unit sites, if they don't have a lot of resources, it may have a major impact. These sites that are now being taken over by large companies, they can't afford to have the kind of shutdowns that we've seen in the past, the multi-year shutdowns.

So they're going to have to focus on making sure the plants are properly maintained. So it's going to be up to us to look at the different facilities and the different situations they're in and to try and understand it. But I don't think you can make a statement across the board that it's going to have the same impact.

MR. DAPAS: That's one of the things the agency is looking at is industry consolidation and there is a working group that I'm involved in to understand what changes may be necessary in certain program areas as a result of industry consolidation.

DR. SIEBER: I don't want to ask too many questions and get you off schedule.

MR. DYER: I think I've blown my schedule.

DR. SIEBER: I'm sorry.

DR. POWERS: We have a tradition of doing that.

MR. DYER: Yes. But what I was going to do is now turn the meeting over to Jack Grobe and Mark Dapas and let them got into more of the details of how the DRS and DRP organization goes, consistent with our program.

MR. GROBE: We had some donuts delivered and, Dr. Barton, do you want to just take three minutes?

CHAIRMAN BARTON: No, we're behind schedule. If you want a donut, get up and help yourself.

MR. GROBE: Excellent. We've laid out an agenda that I think that I think, we had coordinated with Jit, that hopefully meets your needs. We've got about 65 slides to go through, which our ability to do that is probably limited, but our goal is to make sure that we answer all your questions.

So I'm going to try to be a little bit of a gatekeeper on the clock and move us along as we go.

But the first thing we're going to do is talk a little bit about how we're structured, how we're implementing the new program and some lessons learned on the new program, and then invite Sonia Burgess up to talk about our senior reactor analyst program. She's one of my SRAs.

MR. DAPAS: I thought I'd start out with kind of a broad overview of our geographic responsibilities. You can use the slides of you can go through the handouts we provided, whichever is easiest for you.

But we are responsible for 24 operating reactors at 16 sites, and that consists of 13 pressurized water reactors and 11 boiling water reactors. As Jim said, our responsibility encompasses an eight-state area. We've got six sites in Illinois, two sites in Wisconsin, three sites in Michigan, two sites in Minnesota, two sites in Ohio, and one site in Iowa.

And as Mr. Dyer mentioned, it's relatively easy to travel to any site. We can get to Prairie Island and Monticello, which is near Minneapolis-St. Paul, Twin Cities area, in a day; same thing with Duane Arnold, near Cedar Rapids, Iowa. So that doesn't present the challenge that it does to some of the other regions in terms of being able to get to the sites.

The Division of Reactor Projects, or DRP, has roughly 75 professional and administrative staff. Most of the inspection staff in DRP has an engineering background or a technical science degree. So we have a fairly professional staff.

And we've organized the branches to provide additional oversight to D.C. Cook; D.C. Cook, of course, being an agency-focused plant. We've got one branch dedicated to Cook, which results in the other five branches have three sites apiece, and we thought that was appropriate considering all the inspection activities and coordination of our technical issue resolution that's associated with restart preparations by the licensee. And I'll go through more specifically how we're organized in a minute.

Next slide, please. I thought I would talk a little about the functional responsibilities for the Division of Reactor Projects. One of the most important functions we have is inspection program management. DRP is the clearinghouse for the inspection program. We're sort of a gatekeeper for regulatory activities associated with the specific sites. We manage the site-specific inspection plan.

I expect the branches to be cognizant of all NRC activities. That means specialist inspections that are ongoing by the Division of Reactor Safety Inspectors, DRS, allegations, status of enforcement actions. The branches are knowledgeable of all the inspection findings, performance indicator information, and any outstanding inspection follow-up items.

So all regulatory activities and issues that impact on inspection responsibility are pretty much processed through DRP.

We maintain a continuous on-site inspection. Specific inspection activities are carved out for the residents on a periodic basis, and that's, of course, within the context of the new baseline inspection program.

But there is a premium placed on that on-site inspection and the ability to observe activities firsthand.

DR. WALLIS: Excuse me. Continuous to me means it goes on all the time. That can't quite possible.

MR. DAPAS: We don't have 24-hour coverage. Continuous meaning that we have a day-to-day presence.

DR. WALLIS: That everyday there is a presence.

MR. DAPAS: Yes, correct. Daily on-site inspection would probably be more appropriate.

MR. CALDWELL: They also, they live in the general area and are available to go in for event response, or if there is a particular issue.

DR. SIEBER: Do you have any problems filling those jobs, are you shorthanded?

MR. DAPAS: I was going to talk a little about some of the staffing challenges we have in maintaining the resident positions fully staffed and give you an idea of where we're at.

DR. SIEBER: When you do that, you can also talk about rotation, there is a certain rotation that's supposed to occur that sometimes doesn't because of lack of personnel.

MR. DAPAS: I was going to comment on that specific item.

DR. SEALE: I would also like to hear about growing those positions in the sense that the revised inspection process, the interest in risk-informed regulation and so forth seem to be adding to the challenges that the inspectors face, having to operate in a slightly different environment, knowing when to inquire of the risk analysts about appropriate information concerning the operations at the moment and so on.

I would be interested in how you are growing those people in that sense.

MR. DAPAS: I think we will touch upon that. If we don't, point that out, please. The residents are the focal point for agency interface with the licensee. Of course, there's the routine exit meetings and where the resident staffs discuss their specific inspection results.

They maintain cognizance of the results of any DRS inspections. When the licensee identifies any type of degraded equipment, which would result in like a technical specification limiting condition or LCO entry, that's communicated to the resident inspector and reportable events are communicated to the residents, any notice of enforcement discretion requests that are developing.

Basically, the resident is the information conduit and that includes licensing issues. Certainly, there's discussions between the NRR project manager and the specific licensee representatives involved in licensing activities, but the residents are cut in on that and they inform the region of outstanding licensing issues.

So they're clearly the focal point for that communication between the NRC and the licensee, which underscores our goal of assigning mature, professional individuals to the sites, because they are the eyes and ears of the agency, in many regards.

Also, the resident staff serves as first responders for incident response, as Jim Dyer mentioned and Jim Caldwell. The resident inspector would respond to the control room and the senior resident inspector would respond to the technical support center for any type of emergency event declaration, like an unusual event or an alert. Anytime the licensee mans their emergency plan.

And they provide NRC management with information to determine the appropriate agency response, monitoring, standby, or initial activation, and they ensure the licensee is following their emergency operating procedures and actions for each emergency event classification.

One of the central things that the residents communicate early on to regional management and headquarters management is, is the plant in a safe condition, what are the licensee concerns, what are the principal areas that they're focusing on. So that first communication is very important in terms of the agency responding appropriately.

Next slide, please. I thought it would be informative just to discuss briefly some of the specific inspection activities that a typical resident encounters. There is clearly a focus on operations. We target activities where the plant is configured with the greatest risk impact. As an example, if the licensee is going to perform an integrated test of the emergency core cooling systems, that involves a lot of coordination between the operators, both in the control room and in the plant, valve and switch manipulations.

That may be a risk-significant evolution that we would want the residents to observe.

Event follow-up, as I mentioned before, that could be a reactor trip, a partial loss of off-site power, plant transient, any particular event that challenges the operator response and the residents are there to follow-up on that.

DR. POWERS: Let me legitimately make a point about this response to any event that occurs, that the resident has to do. He becomes literally the eyes and ears in those cases, at least for the first hour or two, he is the eyes and ears of the agency.

But one would hope that that's an activity that he doesn't get to practice very often. How does he practice? How does he develop skill in that area?

MR. DAPAS: We will talk about the detailed qualification program that a resident goes through, but there's a lot of mentoring. The senior resident inspectors have experience in event response. There's, of course, simulator courses that the resident staff takes in Chattanooga, where the plant is put through -- the simulator is run through different emergency transients, and the residents clearly understand what EOP should be implemented, emergency operating procedures.

And there is a specific procedure for event follow-up, which gives the inspectors guidance of particular things that they should be looking for. And one of the things that I think is effective when we have our oral qualification board, which we'll talk more about, it's not uncommon to ask a question, you'll be walking into the control room and there's this, this and this going on, what areas are you focused on, what information are you trying to ascertain.

So we try, to the extent we can, to prepare the residents to be able to provide that event response and communicate the information.

MR. GROBE: The other thing is the resident inspectors in Region III, the folks we've tried to place out there, are experienced and, as Marc, said, mature people, extensive experience as system test engineers, integrated test engineers, folks that had come through the Division of

Reactor Safety. For the operator licensing program, operator licensing folks have extensive knowledge and appreciation of what's going on in the plant.

And within a very short period of time, approximately a half an hour, they're going to have a ton of support from the regional office.

DR. POWERS: Yes. But it's really that they're working on their own and having to use their own judgment. Of course, nothing schools judgment better than experience. And the number of events we have, I mean, we just don't have very many.

So experience -- it did remind me of the simulators in Chattanooga. That of course, would be a good thing, having a proceduralized thing, that's a very good thing.

MR. GROBE: And that's the primary focus of our requal training. They get extensive systems training initially, but the requal is primarily focused on the simulator.

DR. SIEBER: And it's been my experience, also, that resident inspectors participate in licensing drills. They are either observers or actual players, and that's really good experience for them, because they not only learn what the licensee is supposed to do, but they see how the licensees act and how to communicate with them.

MR. GROBE: When we get into the new inspection program, you're going to see that we have less flexibility to do that.

DR. SEALE: You can't essentially tag along when a plant operator is going through -- or a plant operations team is going through a simulator exercise with a plant-specific simulators.

Do your inspectors get to, if you will, watch this and ask themselves what their role would be as they go through that?

MR. GROBE: Once every two years, we have a requalification inspection, where we observe the licensees' simulator examinations, and a few years ago, we made a decision, for that exact purpose, to include one of the residents on the requal team, and we try to do that whenever we can.

But we wouldn't be in a mode of interfacing with the people that are in the midst of an examination.

DR. SEALE: I understand that's a very careful line there.

MR. GROBE: It gets the operators into the simulator.

DR. SEALE: Exactly.

MR. GROBE: And it gets the resident inspectors into the simulator on some periodic basis. The one area that I'm concerned about, and we're looking at trying to do something about, is that we have very limited training on CMG, the severe accident management guidelines. All the licensees that had training on the CMG materials and our emergency responders have limited training in that area, and we're looking at trying to do something to familiarize the staff and management on the severe accident management.

MR. DAPAS: When I was talking about event, I talked about it in the context of a significant event. Of course, event can cover a broad spectrum, certainly.

One of things that we engulf with our event response procedure is an assessment of the risk associated with that particular event to determine should we initiate a special inspection, and that's pretty clearly defined.

DR. APOSTOLAKIS: How do you do this? How do you assess the risk?

MR. DAPAS: We look at conditional core damage probability. We look at what was the particular equipment configuration, mitigative systems, et cetera, and what is the risk associated with that challenge.

Obviously, when you have an event, if it's a loss of off-site power, reactor scram, you had the initiating event, now what's the consequence of that, what systems were available.

DR. APOSTOLAKIS: So for each unit, you have a

PRA?

MR. GROBE: No. We have very limited tools available to the residents, broad guidelines on what are the most risk-significant systems and things of that nature.

MR. DAPAS: But it's different than what we did have in the past, which was more deterministic. I think as a result of the Indian Point 2 event, we incorporated more risk perspectives into our event response procedure.

DR. POWERS: I'm not sure we can get into it right in this presentation, but one thing that you might comment on, we have discussed this issue of tools, risk tools available to the residents and the wisdom of whether they really want tools, to have more tools or not, because they've got a full-time job as it is, that's maybe adequate if they have risk information resources available to them, the role that normally is played by your senior reactor analysts.

But asking a guy a question and being able to look it up yourself are two different things. So this balance between information directly available to them and resources available to them is interesting. I don't know how you make the decisions. If you have thoughts on that, it would be interesting to hear.

MR. GROBE: Truly, I don't believe we want the residents doing risk analysis in an event response. They need to be aware of what's going on at the plant, what are the precursors to further severity of the event, making sure that the licensee is focusing in the right areas and providing information to us.

But both of your risk analysts are on-call. We got into this just recently with an event. It's difficult to provide risk analysis on any sort of short timeframe. We're trying to develop a concept where within a few hours, they can provide the agency some risk insight, but not any sort of analytical or very technically defensible risk analysis on a period of a couple of hours, to determine whether or not that could provide further insight on the extent of the team that we should send out or the type of response the agency should take.

Within a matter of 24 hours, we should be able to provide some fairly defensible risk analysis of what's happened.

From a responder point of view, 24 hours is not terribly useful. So there is an interesting conundrum there.

DR. POWER: That's really incredibly useful information there, because I'm wrestling with how fast we should be able to do risk information and I think you've given me a key. Clearly 24 hours is too long. Now, what is the appropriate time? It sounds to me like an hour or two is the kind of rate you'd really like to be able to do things in.

MR. CALDWELL: Let me clarify something here. What Jack is talking about is the type of follow-up event response we would conduct. The inspector, the resident is still going to go to the site on an event response and they're in the mode of observation. They'll go to the control room, they'll observe operator actions, they'll observe plant conditions, and that information will be fed back to us.

But they will not be constrained by some sort of probabilistic review. But our follow-up event response would -- our special inspection or AIT or whatever we decide we might need will depend on the risk of the event itself.

MR. DYER: I think the residents need to have a general understanding of the risk models, what are the vulnerabilities at the plant. As they go in and they initially respond, they're not in an inspection mode. They're in a protect public health and safety mode in the incident response, as we all are in that role.

And so from that perspective, when they go in, they need to know what are the critical assumptions, what are the vulnerabilities, what are they going to check on, what are they doing, are they following their EOPs, are they staying in their modeled assumptions and that.

DR. BONACA: I have a question. RES has been developing plant-specific models, PRA models, they are simplified, or apparently they're getting into a more complex presentation of the plants.

Are they available at the region level, those models?

MR. GROBE: Sonia.

MS. BURGESS: Yes. The models that we are talking about are available in the region. Mike Parker and myself are the ones that have the models here in the region. The residents at the sites do not have the models.

MR. DYER: They're going to make a presentation and talk to you later on. So I think the answer is yes.

MR. GROBE: The residents understand the risk-significant systems and they understand that their principal focus is do you have the ability to move water, do you have the ability to provide electrical power where you need it, do you have containment through piping systems. So that's what they're focused on, what the licensee is prioritizing as far as their response to the event, and that's where they need to be focusing.

MR. DAPAS: I think that's best illustrated -- we had a recent example here with Palisades, where they had a problem with the diesel generator output breaker, where the breaker failed and they could not open it. They had lost control power. The residents responded to the control room to understand what was the impact on emergency A/C power availability and communicated out to the branch chief, and then we had Sonia Burgess involved looking at what's the ongoing risk impact of not being able to open the output breaker and what damage may have been -- when you motorized the generator, was there a problem.

So that would provide us a perspective, what's the risk significance of the plant continuing to operate in this condition and should we provide any augmented support to the resident staff.

DR. WALLIS: As the technology advances, one could imagine that inspectors in the future could have some handheld computation device which would give them a SPAR.

MR. GROBE: We get very anxious when we start talking in that area, because a lot of this is instinctual on how you respond to an event. Let's just say we get anxious.

DR. POWERS: Well, I think my own view was that inspectors have more to do with providing the input to risk modeling on a pump than they do running the pump.

DR. SEALE: They need to be able to communicate.

DR. POWERS: And you'd be -- I mean, all of these things. One of the biggest concerns that I have about the oversight program is it's taking away from hours in the plant to hours at the desk, and that's a tradeoff which ought to be consciously made.

And having risk tools to play with, it quickly becomes risk tools that you have to play with and that is just another detraction from eyeballs on the plant.

But I'm looking at, at the same time, this guy should have all of the support he thinks he needs in answering questions, in his mind, about risk. So it's really tools for Sonia and her team that I think we're talking about here.

DR. BONACA: On the other hand, my question was more in the direction of just part of the maintenance rule now, the operators can take out-of-service multiple components and, of course, there is a requirement for the to evaluate the risk significance and to what extent a resident does a spot-check for a given configuration that he may consider risky enough for him to ask a question, without having to depend entirely on the plant staff.

I think that is an important objective long-term, it seems to me.

MR. DAPAS: Nora Collins was smiling. She is going to be talking later about on-line risk and I think can provide some insights in that area.

MR. CALDWELL: There are a couple of issues associated with the SRAs availability of having the analyst.

So we're looking at succession planning for the SRAs, but integral in that is there's a task group they're putting together with NRR and the regions to look at that question.

But integral to that is a discussion on training and what types of training that the various levels need and one of the -- the regions, I guess, got together and decided one of the aspects of training that all the inspectors need, including the resident inspectors, was risk inspection planning, which would go to what you're talking about; what things should you look at and when should you look at them.

So there is a task group that's going to look at the types of training that should go to the residents, the type of residents that should go to senior inspectors here in the region, and succession planning for the SRAs.

DR. POWERS: I think that speaks to the issue of how detailed and how high quality we have to have the risk resources, not necessarily the turnaround time, but the quality and detail, which is an issue in itself, whether the SPAR models are adequate or we need something more detailed, because inspectors tend to look at things at at least one level down on the level of modeling PRAs.

I mean, it's the same problem the engineer at the plant has. He tends to work on things that are a level down.

MR. DAPAS: For the sake of timeliness here, I'm just going to kind of go through examples of each activity here, but I'll just point out a couple of things. Operability evaluations, clearly, the residents get involved in evaluating the impact of degraded equipment.

If a pump is supposed to deliver X amount of flow for the surveillance procedure, it doesn't pass the surveillance test, and then the licensee does an evaluation and says, well, the pump can still perform its intended function, that can lead into a 50.59 evaluation, because the pump operation may be different than described in the final safety analysis report, et cetera. So they get involved in that.

Severe weather preparations --

DR. POWERS: We're going through a substantial change of 50.59.

MR. DAPAS: Correct.

DR. POWERS: And there's a high judgmental capacity content to this on what is a minimal change in the impact assumptions, things like that.

MR. DAPAS: I think our safety system design inspections get more intrusive into the quality of the 50.59. The role of the resident is the licensee conducts a 50.59 and they kind of look at does this make sense. If they need more additional help, they can engage DRS inspectors.

But looking at it from the programmatic aspect, I think select samples as part of your design inspection.

MR. GROBE: I think, if I understand your question correctly, it was what's the staff's reaction to the judgment and the subjectivity that might go into the new decisions in the rule.

I think the staff truly was uncomfortable with some of the Draconian outputs of using the rule as it was written before. Some unreviewed safety questions that were really insignificant would result in enforcement action.

So on that specific issue, while it involves more judgment, I think the staff is more comfortable. There are a number of areas with the new inspection program that the staff is not as comfortable as what we used to have and we can get into some of those.

But that's an area I'm not sure we have a lot of concern with. The implementation we haven't actually seen yet, so we're going to have to walk through that.

DR. SIEBER: I think we would like to hear your concerns later on that, so we know what they are.

MR. DAPAS: Now I more fully understood your question. Severe weather preparation, with the plants we have located here in northern climates, we get involved a lot in that. In fact, we had an issue at Point Beach regarding freeze protection for a safety injection recirc line, tangible example of where inadequate freeze protection resulted in problems.

And problem identification and resolution. An integral part of each inspection procedure is ten to 15 percent of that is dedicated to follow-up for problem identification and resolution, and that, of course, is the foundation of new program, corrective actions.

And there's two aspects to that. Of course, annual review and then follow-up on issues specific to the area being covered by the individual module, like surveillance testing.

DR. SIEBER: In that regard, under the new oversight process and significance determination, they aren't writing as many violations. On the other hand, we're probably writing more non-cited violations, and all those are supposed to go into the CAT.

Do you folks follow-up inspecting CAT to make sure?

MR. GROBE: Not all of them. There's two. One is that we do a regular inspection of the effectiveness of the corrective action program and that's run out of Merck's division, and we have people on that inspection.

In addition to that, we sample a portion of non-cited violations as part of that inspection, but we don't look at all of them, and that's part of the new inspection program that actually makes sense, because the violations we identify are a very small portion of the total number of issues that need to be corrected on a yearly basis.

So we'll select a portion of the violations we identify and that were non-cited, as well as a large number of other issues that we focus, from a risk perspective, on trying to get the more important ones.

DR. SIEBER: I guess my personal feeling is that NRC gave up something when it moved from deterministic systems into risk-based systems and significance determination. What you gave up was the ability to write a violation and get a written response and a commitment from the licensee that you could follow-up up on and for a given unit that could have been anywhere from five to 20 items a year.

On the other hand, once you give that up, you have to put a little more emphasis and follow up with a corrective action program to make sure that it didn't disappear.

MR. DAPAS: You're right. That's a balancing act, obviously. The crux of the new program was what's the appropriate amount of regulatory burden. You're writing violations, the licensee has to respond, what is the threshold for that.

That's why we -- we put great stock in our problem identification and resolution inspection. We think that's a critical aspect of the new program.

DR. SIEBER: Even the Commissioners see that as a key. They're very adamant about that.

DR. POWERS: Well, I think the Commissioners see it more than the headquarters staff.

MR. DYER: Well, I don't know that. I think it's we -- a lot of the violations, I think, as Jack said earlier, a lot of the violations that we wrote, we were spending a lot of time on correspondence that didn't improve the safety of the plant.

DR. SIEBER: Yes. We were on the other end.

MR. DYER: So I think the new program does allow -- what we have to do is take significant actions when we find a licensee is not -- when they break that trust.

And one of the things we get through here, when we start looking at the new program, that is the importance of the cross-cutting issues, in my mind, as a regulator, and, in particular, the corrective action program.

As you said, we are turning a lot over. This will make for a more efficient and effective way of regulating and allow the licensee to prioritize, but they have to have a good program.

MR. CALDWELL: There's a major challenge to the licensee that comes out of this. In the past, when we wrote a violation, it came out in our report, they had to respond. Typically, they had to get senior management to agree with the response, so that the managers were heavily involved in those activities, at least the inspection activities that we conducted.

Now, it's included in their corrective action program. So the licensee's management has the challenge of staying involved in those issues that occur. They are going to have to be asking more questions and getting more involved in their corrective action program. So it is a challenge.

MR. GROBE: Our ability to cause licensee management to engage in issues is diminished under the new inspection program. One of the things that we got good at and our staff gets very good at is appreciating a broader perspective and focusing on root cause.

Now, as Jim indicated, the licensee has to take that burden completely on themselves, which is appropriate, but our ability to direct that, unless it results in a risk-significant issue under the SDP, is limited.

DR. SIEBER: One final question, which you can answer yes or no. You have exit meetings when you conclude an inspection, either a resident or a specialist inspection. Since the new oversight process and the burden has changed, do you have any idea whether the level of management that attends those exit meetings has changed to a lower level since there is less management involvement?

MR. DAPAS: I can actually comment on that specifically. I think there's actually been a higher engagement of management, because we communicate at that exit meeting some issues that may not be documented in the report, and that's a program office policy decision that some issues that don't rise to the threshold of an inspection finding or a green issue, the licensee is interested in hearing about those and those are communicated at the exit meeting.

Many times, a site vice president or plant management wants to hear those firsthand.

DR. SIEBER: That's good input for me, because I would have expected, just human nature being what it was, that it would have gone the other way. So that's good. Thank you very much.

MR. DYER: I think the other dynamic in that is, again, the economic pressures. Licensees realize that the NRC inspection findings that are below the threshold for being documented in the report can, in fact, affect their operation, you know, may provide them an insight or something maybe to address before it -- it's a precursor.

In today's environment, that's necessary.

DR. SIEBER: Thank you.

CHAIRMAN BARTON: Gentlemen, we're going to have to move this along a little bit. Maybe we can have some more questions during the lunch break. We're one-third through item three, which was supposed to be completed at this point. So I think we need to kind of hold questions and have maybe some discussion during lunch. Otherwise, we'll never get through today.

MR. DAPAS: The last point I was going to make is performance indicator verification, obviously an important activity the residents are engaged in.

We had a number of lessons learned from the pilot program that have been communicated to licensees, and that underscores the importance of consistent application of the performance indicators, and I think we're going to talk more specifically about those a little later on.

Next slide, please. This is just a slide showing how the division is organized, as Mr. Dyer said, relatively consistent across the regions. We are currently only one site is staffed at N+1, that's D.C. Cook; of course, our agency focus plant, and we're actively recruiting to fill the reactor engineer vacancies that exist.

I'm going to talk a little bit more later on about the challenges that have been presented to DRP in trying to fully staff in the context of the new inspection program requirements.

DR. WALLIS: You have four vacancies here at the reactor engineer level?

MR. DYER: That's correct.

MR. GROBE: What we've done is added overage positions. Several of those positions are overage, and we've done that in operator licensing and both engineering branches and in the reactor engineering DRP. And the goal is to minimize the amount of downtime we have, when we lose a number of the staff.

So we're trying to fill those up. Once we fill them, we're going to have a substantial buffer, we hope.

MR. CALDWELL: These reactor engineers are not intended to be overage positions. We do have overage positions elsewhere, but we're trying to stay ahead of our -- unfortunately, we never meet our ceiling. And so we're trying to get ahead of the ceiling so that we at least have utilization of all the FTE who are left.

MR. DAPAS: We bring the reactor engineer on board and a vacancy occurs at the plant and that's got to be our primary focus, is making sure the sites are fully staffed. So it's an ongoing challenge to try and fully staff the reactor engineer position while keeping the resident program fully staffed.

DR. WALLIS: Because if you lose one more, you'll have none, it looks like. Four out of five.

MR. DAPAS: We're heading the other direction.

DR. APOSTOLAKIS: I have a question. I'm looking at the report from the web site regarding the maintenance rule. It says that you interviewed two licensed reactor operators and three senior reactor operators to determine if they understood the general requirements of the maintenance rule.

Is this something that you do routinely? I mean, what if they don't understand it, what would you do?

MR. DAPAS: Which -- I'm not familiar --

CHAIRMAN BARTON: This is the follow-up to the maintenance inspection report that was done in the regions. Part of that was going in and asking various people on the stations what was their knowledge of the maintenance rule. Remember that part of it?

DR. APOSTOLAKIS: Is it still the situation that we will interview people to see if they understand something under the new revised oversight process? Is that part of the baseline inspection?

MR. DYER: Not that I know of. That might have been a special inspection. Was that done under a TI?

MR. DAPAS: I thought that was associated with implementation of the new maintenance rule.

CHAIRMAN BARTON: That's what it was.

MR. GROBE: It was a special inspection.

MR. SINGH: It was a follow-up inspection to the original inspection.

MR. GROBE: Right, where there were open issues, and you go back out, and part of that, I think, was ensuring that the licensee understood performance goals and on-line risk assessment.

CHAIRMAN BARTON: A lot of that was going into the control room to ask the SROs, the supervisors, how was their knowledge of the maintenance rule.

MR. GROBE: We have one our maintenance rule experts here, Any Dunlop.

MR. DUNLOP: The maintenance rule baseline inspections and most likely what this was, there were some open issues that came up during the baseline inspections and what we did at each of the sites, when we had open issues, we would go back and follow-up on them, and that's most likely what this inspection report is discussing, a follow-up inspection to address any open issues that had come up.

I'm not sure, I wasn't part of the follow-up. I was part of the original inspection.

DR. APOSTOLAKIS: It's not really this specific thing that I'm asking about. I'm just asking, in the future, with the new oversight process, is there room there for us as an agency to see how much the licensee knows about something? Aren't we supposed to be moving towards a more performance-based system? Is there a cross-cutting issues that says try to see how much this operator at the plant knows?

MR. DUNLOP: I think the maintenance rule is supposed to be one of our first performance-based rules that we put into effect and I think the purpose of the baseline inspections was to, unfortunately, have a programmatic review of what the licensees know and how the program was actually put together. I know as part of the new A-4 new maintenance rule, there will be some PI developed and we'll be doing some inspections at some of the sites.

How much we'll be looking into the programmatic aspects versus the performance-based, I don't that's been determined yet.

MR. DUNLOP: I believe that inspection was sort of a -- the baseline and the follow-up was sort of to set the groundwork to then go forward. In the future, I don't believe we're going to be quizzing people on their knowledge level.

I think part of the baseline inspection, if I remember correctly, part of it was to see did the training take. When you go in and you took it, when they had implemented a change in the program, part of our inspection is, okay, did the training take, do people understand their responsibilities.

And as a basis for that, that was the nature of the questioning and I think that was specifically called out in a temporary inspection, which would be not part of -- it would be a one-time inspection, not part of a routine inspection that we would continue.

So it would take the headquarters, if they decided, for some other reason, that we needed to go back out and periodically reverify the training, then we could look at it again, but it wouldn't be part of our normal routine program.

MR. GROBE: I was going to say, by contrast, whenever we observe an activity, I expect the inspectors to be assessing the knowledge level of the people that are performing that activity of the procedures and the specific work they're doing.

So we would continue to evaluate, if we observe a maintenance activity or a test activity or an operations activity or talk to an engineer about a calculation, we'd be assessing their understanding of what they're trying to accomplish and their understanding of the procedures involved in that.

So we will still be getting into assessing the capability of the people to accomplish the work they're trying to accomplish for those activities where we're observing performance.

But as Andy pointed out, that was strictly a programmatic inspection. It didn't involve actual implementation of the program as much as on a day-to-day basis, as much as the programs, procedures and training.

DR. APOSTOLAKIS: There are similar findings in other places, and I'm not questioning you why you did this. I'm trying to see what the future will be under the new oversight process. We have the cross-cutting issues, of course.

MR. DAPAS: We have an individual that actually has probably conducted the resident inspector portion of that and certainly can speak to what the new program entails as far as the maintenance rule.

DR. APOSTOLAKIS: While you're getting the microphone. I've made several findings here that really I didn't expect to see. For example, The company nuclear review board members were thoroughly prepared for the September '98 meeting.

MR. DAPAS: Does that embody observations and --

DR. APOSTOLAKIS: Yes, but is it going to be in the future, are they going to be observe whether people are well prepared. There was a finding later that the expert panel deliberations were not recommended, and so on.

And I thought that in the new oversight process, what really matters is the decisions of the expert panel and not whether they document what they're doing.

So the question is how much of this is going to change in the future, if any?

MR. DYER: I think you'd have to look at either the Quad Cities or the Prairie Island plant issues matrix to get a better understanding as to what the new program is going to look like. Davis-Besse was under the old program.

DR. APOSTOLAKIS: I understand. This is old.

MR. DYER: And there's a specific module. So the resident inspectors, once every 18 months, had to go observe an off-site review committee, and they do the best they can.

MR. COLLINS: I can talk to that. My name is Laura Collins, and I was a resident inspector at the pilot plant, Quad Cities, and did the maintenance rule inspection portions for the residents there a lot.

The kind of observations that you're talking about, unless they were to really result in a problem, because we're more results-oriented, are not the kinds of things, I don't think, we would be documenting anymore.

But we would still be, if we observed those things, communicating them to the licensee, so that they can learn from them.

So if we make those observations, we're going to share everything that we observe with the licensee, but we have higher thresholds for findings. There's got to be some kind of a result of that improper implementation of the maintenance rule.

DR. APOSTOLAKIS: So that in the future, then, you would not particularly care about how the expert panel conducts its business. You would just look at the results.

MS. COLLINS: That's right.

DR. APOSTOLAKIS: Is that the correct perception?

MS. COLLINS: We start with the results.

DR. APOSTOLAKIS: But you may get back into the thing, I mean, if you want to understand --

MR. DYER: I think one of the things that the utilities, the vice presidents, are particularly interested in is if we said we observed the meeting, we have no findings, a lot of times they'll ask you, what did you think of the conduct of the meeting, and that's one of those issues that may be provided below the line, but it's not going to be documented in the inspection report, there's no response required.

MR. CALDWELL: And it's not that we don't -- you said we may not care about it anymore. We still care, but we wouldn't document it necessarily. We would communicate it to the licensee, if we felt that would give them some insight.

DR. SIEBER: Unless you came away with the feeling that the result was inadequate, and then you may go further to find out why that is.

MR. DYER: Now, if we come out with an inadequate safety review, we may take it back to there was an inadequate safety review, it was not adequately reviewed and people weren't prepared, something like that. But it would be tied to the results.

MR. DAPAS: Or then the expert panel concluded this system should be -- there should be performance goals established for this system to review its importance and risks, and the licensee didn't address that, that would be a result.

DR. APOSTOLAKIS: I agree, but that is clearly within the new rules of the game.

DR. BONACA: How do you know if there is no implementation. What I'm trying to say, there are examples there, some examples where the PRA defined some component that's safety-significant, but determined it wasn't really safety-significant and, therefore, they did not report this activity.

Now, there is an importance also in the documentation. You've got to make a determination that the decision ultimately was the correct one. Performance-based doesn't mean you're waiting until you have an event. It means that you're performing the right things. So you still have a burden on the processes that you have to inspect and the show of the work.

DR. APOSTOLAKIS: See, what confuses me -- and, again, I'm not referring to a specific thing, but is that in Washington, we're being told time and time again that managing the plant and the organizational aspects are really the licensee's responsibility and we should not get involved.

In fact, several of the research projects of the Office of Research have been killed on that principle. And then I come here and I see that an appropriate feedback process was in place, operators responded conservatively to plant transients, operators were prepared for the possible closure of feedwater regulating valve surveillance testing.

All this is organizational management, isn't it?

MR. GROBE: No.

DR. SEALE: It's

CHAIRMAN BARTON: It's observation of plant operations, George.

DR. APOSTOLAKIS: But there is a feedback process? That's their business.

MR. GROBE: Well, it's also required pursuant to Appendix B.

DR. APOSTOLAKIS: So what we are told there is not entirely accurate. I'm trying to reconcile the views. It's very fuzzy, isn't it?

CHAIRMAN BARTON: Especially when you're assessing management's competence and safety culture versus observation of plant operation.

DR. APOSTOLAKIS: That's an extreme, I agree. I agree. But having an appropriate feedback process, it seems to me, is an organizational issue.

MR. GROBE: I'm not sure what the context of that was. But it's important, though. For example --

DR. APOSTOLAKIS: Plant issue matrix of Davis-Besse, dated September 28, '99.

MR. GROBE: For example, within the training context, the feedback process is absolutely critical, because on a system-based training process, you have to have that loop. In the training inspection, that's part of what we look at.

Within the context of an oversight committee, the engagement of the committee in questioning the quality of the product and understanding it is critical to the outcome. So if we only look at the outcome of the meeting, there may be significant things that they missed because they weren't well prepared for the meeting.

And it gets to root cause, really. If we're going to have inspectors in the field observing the activities, those are the kinds of things we expect them to look at. As Laura pointed out, those issues wouldn't find their way into a report today unless they resulted in a risk-significant finding.

MR. DAPAS: And that's the key. Regulatory engagement is a product of the consequence of that, but we would still feed that observation back to the licensee.

MR. GROBE: Exactly. Both positive and negative. If we found that the people performing a maintenance or a test activity were very qualified and competent and displayed that in their discipline, in the way they approached their job, provide that feedback.

DR. APOSTOLAKIS: So the action matrix of the new oversight process, that would not be triggered. That would not be affected by these observations. You just provide the feedback.

MR. GROBE: That's right.

DR. APOSTOLAKIS: Because there is nothing white.

MR. GROBE: That's right.

MR. CALDWELL: You also understand we're in the initial implementation phase of this new process, this is what we think, we may learn something as we go along and change our approach, but right now, that would be the outcome.

MR. DYER: What we found at the two pilot plants that we've implemented the program in, when we first went to -- we actually applied the SDP to it and we went through our formal exit and said here's our formal observations and the utility management look at us and say is that all, you've been here for a month, you need to give us more feedback.

It evolved out of that --

MR. GROBE: Tell us what you really think.

MR. DYER: Yes. And evolved out of that is we have a formal exit now where we say here is what is formally going in the inspection report, here's our observations that aren't going to make the report.

MR. GROBE: Dr. Barton, in the interest of time, let me quickly go through the next six or eight slides, and, Bruce, keep up with me.

In the Division of Reactor Safety, we really have five major functions; engineering inspections, health physics and emergency preparedness inspections, safeguards inspections. We also have operator licensing and that includes initial examinations, upgrade examinations, as well as requal inspections, and incident response is one of the major functions of the Division of Reactor Safety.

Let me just highlight a few things in the engineering inspection area that are new and exciting. We have a much stronger emphasis today on design inspections. We have an inspection called the safety system design inspection, or the SSDI. We also have an inspection that focuses more heavily on the Appendix R design of the plant and the ability of the plant to sustain a debilitating fire.

Those are two inspections that are new, much stronger emphasis in the design area.

DR. POWERS: I attended the fire protection forum and it was an interesting complaint. They said, gee, you guys are focusing all your attention on this Appendix R and the safe shutdown and neglecting all this other fire inspection stuff, and it's just not right. The fact is we haven't done the Appendix R safe shutdown inspections in the past to the extent that they probably should have been done.

And now we're just bringing things back to some sort of proper balance.

MR. GROBE: And we're not disregarding classical fire protection either. That's part of the resident program. But there's a summary on the slide of the types of engineering inspections we get engaged in and we'll go into some more detail later on some of those.

In the safeguards area, we look at contingency response, access control and fitness-for-duty primarily, and, as Marc indicated earlier, each component of our inspection program, we look at problem identification and resolution or the effectiveness of the corrective action program.

DR. SIEBER: When you do an OSRE, though, that also involves the operations people, right? With strategies and so forth.

MR. GROBE: Exactly.

DR. SIEBER: But that's not part of your baseline inspection. You're just looking at cameras in the field and --

MR. GROBE: Contingency response is actually --

DR. SIEBER: Is that in there?

MR. GROBE: Yes. It's kind of in there in hiatus right now. OSRE is suspended and we're trying to work with the industry to come up with a better way to do force-on-force drills.

DR. POWERS: One of the questions that I've had about that is the extent to which we can use some of the computational tools that have been developed by the national laboratories, among other people, I think, for simulating these force-on-force exercises.

They won't do everything that the OSRE does for you, but they would certainly augment or maybe reduce the need to do actual OSRE type activities. Have you looked into this at all?

MR. GROBE: I don't know.

CHAIRMAN BARTON: It's a civilian industry initiative at this point.

MR. GROBE: These are simulation type tools that --

DR. POWERS: They were originally developed -- the ones I know about, the ones that were originally developed were Air Force bases in Europe. They became concerned when the Red Army was running around, could they, in fact, defend their weapons systems from an intrusion force, and that would be different than an ordinary military fighting force.

And they had done a lot of exercises with these guys with laser rifles and things that had sensors all over them and they computerize it and out of that they come up with what's the optimal strike force against it, what are the vulnerable sites, locations on the facility and things like that.

MR. GROBE: I'll look into it.

DR. POWERS: They eventually got very sophisticated, but I don't know whether they've gone into the commercial sector or not.

MR. GROBE: I have not heard about it.

DR. POWERS: They resulted in massive changes to the way they the military protected their facilities. I mean, they were shocked at how easy it was to break in.

MR. GROBE: Appreciate that insight.

In the rad protection area, three primary focuses; plant protection of the people on-site, radioactive waste and transportation, and protection of the public, effluents and environmental protection.

DR. SIEBER: This is probably where Illinois Department of Radiation Safety comes in quite a bit.

MR. GROBE: Well, they're much more intrusive. They have reactor safety specialists that are resident at the sites. They are very sophisticated, very impressive organization. Not quite as good as us, though.

DR. SIEBER: Well, I knew that.

MR. GROBE: In emergency preparedness, we observe exercises, as well as do programmatic reviews on a regular basis. Operator licensing, I mentioned earlier, we do initial exams. Sometimes those are SRO, instant SROs exams, sometimes reactor operator exams.

We also do upgrade exams and requalification inspections. In each area, again, problem identification and resolution.

Incident response, we maintain and coordinate for the region maintenance of our incident response capability, and that includes exercises, training, equipment and facilities, as well as interface with Federal, state and local, and unique in Region III is some tribal interface up at the Prairie Island plant.

The division is broken up into four branches. Two engineering branches, one focusing primarily on electrical, which includes environmental qualification, I&C, fire protection, electrical engineering and analyses; mechanical, which gets into mechanical, civil structural, as much as we do these days, maintenance rule, in-service inspection, steam generator replacement, steam generator tube inspections, things of that nature.

An operator licensing branch, which is very busy these days. Unlike some other regions, for example, Region I puts emergency preparedness and operator licensing together in one branch. This branch is strictly focused on operator licensing.

DR. WALLIS: Does mechanical engineering include thermal hydraulics?

MR. GROBE: Are you talking, for example, of -- we do heat sink inspections.

DR. WALLIS: Heat and fluid, yes. Water and steam, where they are and what they're doing, how well they are performing their function.

MR. GROBE: Within the reactor, we don't do a lot of inspection from a thermal hydraulic point of view. However, from a heat sink point of view, heat exchanger performance, we do some inspection in that area.

Plant support is health physics, emergency preparedness and incident response in that branch.

MR. DAPAS: You can get into those aspects, though, like with an operability evaluation, where the licensee is using thermal hydraulic analysis to support a particular conclusion. We might look at that.

MR. GROBE: We just completed safety system design inspection at Point Beach and the focus was the service water system, a lot of thermal hydraulic analysis involved in that.

That was fired through the scrub oaks on Division of Reactor Safety.

CHAIRMAN BARTON: Very good, you did good. At this point, I'd like to break until 10:30.

[Recess.]

CHAIRMAN BARTON: We're back in session. Marc, are you still on?

MR. DAPAS: Yes. The next presentation that we wanted to address was the comparison of the new program to the old program. I think some of you have raised some questions. In the context of the new program, I think this is an opportunity to more thoroughly address some of those.

As an example, I know Mr. Seale raised a question about the resource expenditure tracking and we can talk about what challenges that presents.

Rather than continue to use overheads here, if we can just go through the slides, if that's okay with you.

CHAIRMAN BARTON: That's fine.

MR. DAPAS: Great. Starting on page 20, when we looked at the old program, that was pretty much broken up into thirds between the core program, what was previously termed the regional initiative, and special inspections. Special inspections was our mechanism for following up to specific events.

And as we talked about a little earlier, we use risk as a gauge in determining what's the appropriate engagement in terms of numbers of folks we send to the site.

The regional initiative, of course, involves some subjective judgment about the declining licensee performance in a particular area or aspect of plant operations, and we would send some folks out to do a more intrusive review of that.

Under the new program, it's pretty much baseline loaded, and the baseline represents that minimum amount of inspection required to verify that licensee performance is within the licensee response band, whereas under the old program, the core represented that minimal amount of inspection to verify the plant was being operated safely.

As you know, whether you're in the licensee response band or regulatory response band, there's still a sufficient safety margin. So it's a little different approach.

There is clearly greater flexibility in applying inspection resources under the old program. An inspection procedure could be closed using judgment on whether the intent was met.

For example, inspection procedure 71.707, which dealt with operational safety verification, that would include observation of control room activities, an engineered safety system feature walk-down.

The inspector could decide, based on reading the inspection procedure, I met the intent of this procedure with X number of hours. Under the new program --

MR. GROBE: Before you go on, that's exactly what got Davis-Besse down in the 1,800 hour range. I'm sorry.

MR. DAPAS: When you look at the sampling size under the new program, X number of surveillance tests need to be observed, X number of operability evaluations. There's a certain periodicity; for example, looking at maybe a couple samples a month.

And under the one-size-fits-all approach within the licensee response band, the baseline inspection program is fairly rigorous in the scope and estimated number of hours to complete the inspection procedure. And as Jack pointed out, that can translate to what is perceived to be an increased regulatory burden for a licensee like Davis-Besse, where there was more flexibility in determining was the intent of the procedure met.

In the new program, you have to implement the full scope to satisfy the inspection procedure objectives.

MR. GROBE: Philosophically, what we've done is on the side of the angels. We looked at risk, we picked out what are the most significant risk-related activities. Based on the impact on the risk of that activity, we identified those attributes that were important to inspect and we assigned, developed inspection procedures and figured out how much resources it would take to do it, and it came out to, whatever it is, 2,100, 2,200 hours.

The challenge, point number one, is that that consumes almost 95 percent of our resources. So the combination of things; the new thresholds to get to a white, yellow or red finding are fairly high. So we don't expect to have much supplemental inspection. But we also have much less capability to respond to a problem of that nature, and we're going to have to depend on other regions and headquarters to supply us resources, whereas in the past, that 33 percent regional initiative, we could target those resources based on management judgment.

That made us less predictable, and that was one of the concerns the licensees had.

DR. SIEBER: The real opportunity, and I realize it may be a second or third generation in the application, to achieve this is the extent to which you can make the inspections plant-specific, with justification.

MR. GROBE: We make all the inspections plant-specific.

DR. SIEBER: In terms of coverage, not in terms of --

MR. GROBE: In terms of amount of hours, is that what you're saying?

DR. SIEBER: Yes.

MR. GROBE: We talked about modifying the baseline based on performance. But that gets back to where we were and there is a lot of reticence to do that very quickly. If, after a few years, we find out that they're --

DR. SIEBER: Maturing.

MR. CALDWELL: But it also is the way the system is set up, we're not capable of doing that right now, because there is not a gradation in green band. That's licensee response band, that's where we stay at. So those folks that are in that band get the baseline inspection program, whether they're at the top of the band or at the bottom of the band. That's the way the new oversight process works.

So to try to come up with a way of reducing inspection of one licensee over another is not -- within this current program, that's not possible.

MR. GROBE: The pendulum swung to predictability. We are extremely predictable now. The question is whether or not we've taken too much of the judgment out, such that we can no longer predict problems.

DR. POWERS: What I worry about, especially this point about the inspectors losing judgment capability, it seems to me that the good inspector can quickly say in this area, I've met the intent here, and there are enough problems for me to worry about here, this other area is more complicated for me to understand, me personally to understand than the average inspector, and there may be bigger issues here, and so I need to spend more of my hours here.

That judgment seems to be something that I want him to exercise very much.

MR. GROBE: It's been reduced in the new program.

DR. POWERS: And it seems like he's -- that that's the flexibility that is a real loss.

MR. DAPAS: Let me comment on that. As I understand the new inspection program, the sampling size is intended to be risk-informed. Operability evaluations is clearly going to be a risk-significant activity. If the licensee doesn't adequately evaluate the impact of degraded equipment, will the equipment perform its intended function.

That's clearly related to risk. So what is an appropriate sample size to gauge how the licensee is performing in that particular area.

In the past, under the old program, you may decide to watch one surveillance test and you felt that you've met the objectives of the procedure. Under the new program, there may be two surveillance tests that you look at on a monthly basis, and that's the risk-informed sample size.

So it's more prescriptive in that regard and that's why the hours are more rigorous.

Now, I think after the first year of implementation across all the sites, we may end up revisiting the scope of a given inspection procedure and we're also providing feedback on a continuous basis.

If the inspector is performing a certain inspection procedure and feels that the scope of the procedure needs to be refined, they provide feedback and that's communicated to the program office.

CHAIRMAN BARTON: Well, the intent of the whole initial implementation for one year is to make adjustments after that one year.

MR. DAPAS: Correct.

CHAIRMAN BARTON: Right, sure.

MR. DAPAS: That's my understanding.

DR. WALLIS: It seems to very ironic that the reason for all this is to get away from prescriptive regulation. They seem to have moved to more prescriptive inspection.

MR. CALDWELL: It's prescriptive in the sense that the inspection size or inspection scope and type were supposed to be, as best we could, risk-informed. In other words, you're focusing your resources in the area where there is the biggest bang for the buck.

The desire to make it such that each region and each inspector does it essentially the same way for consistency, but to answer Dr. Powers' question, if an inspector feels they have to spend more time to accomplish a given sample size or given objective, they would take the time necessary to accomplish the objective.

So if the inspector felt comfortable in this area and was able to get it done pretty fast, that's what they would do to accomplish the objective of the inspection. If they felt that they needed more time in another area, they would do it, they would spend the time.

So the judgment in that respect is still there.

MR. GROBE: But they right now don't have the latitude to say I'm going to do 18 operability evaluations versus 24.

MR. CALDWELL: Right.

MR. GROBE: But in addition to that, there's barriers. We have put -- depending on the types of inspections, the error bands can be up to 25 percent as far as number of hours. To go outside that band requires fairly high approval.

So we need to get engaged in what it is that's causing the inspector to have to spend a lot more time, as managers.

MR. DAPAS: And that's because we've communicated that the baseline inspection program is that minimal amount of inspections necessary to verify licensee performance is still within that licensee response band.

MR. GROBE: We spoke earlier about observing more behaviors and you talked in the context of management. Those are the types of things that would give you confidence that you can make your sample size smaller.

If you looked at the procedures and the guidance and you looked at the training and you looked at how the people were engaged in their job, in the past, we -- and all of those things were very positive, so you had a high level of confidence in the competence of the people and how their work activity is controlled, we would feel comfortable scaling back on sample size. Now we don't have that flexibility.

DR. APOSTOLAKIS: Do you think that the new oversight process can be modified to accommodate some of these concerns, without affecting its intent regarding predictability, for example, too much?

MR. GROBE: It's difficult. One of the things we haven't thrown on the table is that it's my sense that one of the motivators of this predictability was the financial community having confidence in a regulatory oversight not influencing negatively the financial viability of the company, from a stock point of view.

So I'm not sure how that would work and we'd have to do that jointly with the industry.

DR. SIEBER: What do you do with a plant like Zion?

MR. GROBE: Zion?

DR. SIEBER: Yes. They still do the -- they haven't applied for decommissioning yet.

MR. GROBE: In the decommissioning area, our level of inspection is directly related to the level of activity that the licensee has on-site.

DR. SIEBER: So you would cut back on the number of residents you have there.

MR. GROBE: There are no residents.

MR. CALDWELL: We have inspectors here in the region that go up there, and Zion is not that far away, but, yes, our inspection program is based on the decommissioning. There is actual inspection plan for decommissioning reactors.

MR. DAPAS: Which is outside the baseline program.

Moving right along. Certainly, under the old program, we used deterministic processes in our enforcement policy to guide our assessment of significance associated with inspection findings.

Under the new program, we process findings in the significance determination process, which is based on the probabilistic risk type analysis. I'd just simplify that down into two concepts. You've got frequency of initiating event and then the defense-in-depth regarding mitigative capability and if you have a particular piece of degraded equipment or unavailable equipment, you look at what impact does that have on the mitigative capability.

You look at the availability of redundant equipment. You can credit operators for recovery actions. And then there is a plant-specific phase two worksheet that is supposed to bring to the table the specific configurations unique to that plant in terms of equipment redundancy.

CHAIRMAN BARTON: Are they all out and back now, are the plants commenting on them?

MR. DAPAS: Yes. Sonia, you might be able to speak to that. I'm not sure of the exact status.

MS. BURGESS: As far as the agency-wide, no. Our region, yes, with the exception of D.C. Cook. We have put our comments back to Research, who has, in turn, given them to BNL.

MR. GROBE: We took a different approach in Region III than some of the other regions took. We had either Mike or Sonia out on each site visit to make sure that we had a clear understanding of the SDP and the licensee effectively integrated plant-specific issues into the SDP.

Some of the other regions had Research do that or headquarters staff. As Sonia indicated, she and Mike have finished all the sites, with the exception of Cook, and we need to get on Cook pretty soon here.

MR. PARKER: But to be more specific, we don't have the comments back from BNL and back from Research yet. So they're not integrated into the current process.

MR. GROBE: We have hand markups of the SDP.

DR. APOSTOLAKIS: Are you comfortable with the SDP?

MR. PARKER: Am I comfortable with the SDP? I'm very comfortable with the site visits we accomplished and the corrections and the adjustments we made to them, but right now the difficulty we have is working with the residents, because it's not integrated into the formal SDP worksheets.

MR. GROBE: It would be interesting to march about a dozen inspectors up and ask them that same question, because there's a lot of -- we use the terms risk-informed and risk-based. The SDP is primarily risk-based.

And an excellent example, and if Laura is still here, she can provide some of the details, if I screw up on the details, there was a finding at Quad Cities involving motor-operated valves, where the licensee did not effectively correct problems on a timely basis, the motor-operated valve setup.

The end result was that they had a number of deficiencies that, if you take together, made it clear that their motor-operated valve program was not functioning.

When I say motor-operated valve program, the setup of the valves to make sure that they could handle differential pressures and all those things.

From an SDP point of view, though, at any given time, there was not sufficient valves that were determined at that time to be non-functional, such that you got out of the green band.

So it was a green finding, yet, it was clear to us that there were systemic problems in the way the engineering work was done to set up the valves, and that was a green finding. So those are the kinds of issues.

We're comfortable with the SDP. It clearly tells us what it's supposed to tell us, and that is whether or not that one specific finding is of risk-significance, given the other situations that occurred at exactly the same time.

DR. APOSTOLAKIS: So what you're saying is that the actual finding may be limited to one or two components, when, in fact, there is suspicion that there is a common cause failure that might affect many more.

MR. DAPAS: If you have information that there's a common cause --

DR. APOSTOLAKIS: This is one possibility.

MR. DAPAS: -- that has to be explored as part of the SDP. You have to have clear information that --

DR. APOSTOLAKIS: But why couldn't you do that for the MOVs?

MR. DAPAS: This was more of a programmatic concern.

DR. APOSTOLAKIS: A programmatic common cause failure.

MR. GROBE: We have a task group right now working on what we call cross-cutting issues and right now what the agency considers cross-cutting issues are the effectiveness of the corrective action program, the effectiveness of human performance, and the safety conscious work environment, which is really kind of hard to separate from the effectiveness of corrective action program.

We've got some concerns in other areas. Being from the Division of Reactor Safety, engineering is a big part of my life, and effectiveness of engineering, we think, is a cross-cutting issue.

We are trying to work through those things and we will be, over the next year, trying to more clearly define how you handle cross-cutting issues and this valve issue is a cross-cutting issue.

DR. APOSTOLAKIS: But let's come back to the common cause failure. Usually there is a suspicion that there is potential for common cause failure. Very rarely you find all valves down. You look at one or two failure and say, well, gee, this mechanism could have affected the others.

MR. DAPAS: That's right. If the torque switch settings weren't set appropriately on valve X, the licensee should try and determine extent of condition, is that the case with other valves, and that could be a potential common mode failure.

DR. APOSTOLAKIS: Then you would go to the SDP?

MR. DAPAS: Correct, if there is sufficient information to indicate that that is the case. But the example that Jack was talking about, where the licensee is trending valve failures and it has programmatic implications, under the new program, the licensee should be putting that issue into their corrective action program and addressing it.

In our annual PI&R inspection, problem identification and resolution, that might be an issue that's part of our smart sample, where we would go in and evaluate did the licensee look at this from a broader context, did they take appropriate corrective action.

MR. GROBE: On that specific issue, Mike and Laura -- Mike, you were involved in that, weren't you?

MS. BURGESS: I was.

MR. GROBE: Pardon me? You were?

MS. BURGESS: I was. I sat on the SDP panel and the SDP panel did not believe that that was a common cause failure, that that was a cross-cutting issue thing, but that was not a hardware, there was no evidence that other valves were exhibiting those kind of failures.

So each individual -- or this valve had to stand alone and go through the SDP process, which turned out to be a green.

MR. GROBE: The threshold for a common cause from engineering issues is very high.

DR. APOSTOLAKIS: So when you say the SDP panel, is it you or the licensees?

MS. BURGESS: The SDP panel is the NRC. It's one SRA from every region and a branch chief from every region, also, plus the program office.

DR. BONACA: Also, if you had a significance determination for a certain event and found it was not significant enough, but you have evidence that it would repeat again, the determination would not -- but then you would refer back to your corrective action program.

MR. DAPAS: That gets to how robust is your corrective action program. Each time there is an event, you have to look at the significance, or each time there is an issue or equipment problem, you look at the significance of that associated with unavailability via the significance determination process.

And if that reflects a repeat occurrence, that calls into question the licensee's corrective action program. But, again, degree of regulatory engagement is based on the overall significance.

For example, you could have repeat issues that are such low significance, it would be inappropriate for us to engage. Now, we expect the licensee to address those, because, of course, the whole premise is the licensee needs to address those low level issues before they manifest themselves in more significant concerns or events.

MR. GROBE: I don't want to leave anybody with the impression that we're not committed to make the program, because we are. I want to make sure that we help expose the challenges.

DR. POWERS: Understanding that the team that set these programs up were under an enormous time pressure, did a heroic job and did a job under the understanding that there were going to be rough edges.

I think these are the kinds of rough edges that are anticipated in this program and getting them all out in the air early is the only way they're going to get corrected.

What we're seeing is some resistance to any changes in programs on the licensee side, which is amazing, but I think there are things that have to be done better and managerial and inspector flexibility strike me as you're really losing something if you take that out of the ballgame where that judgment component comes in.

I mean, what are we paying these guys to be educated for if they don't use their judgments?

DR. BONACA: The reason why I was pursuing that issue before, also, is the fact that on the licensee side, it's been a common defense for a long time that this issue happened, but it wasn't of such significance.

And so although it is an important element of the determination, it's also, at times, a defense and an attempt to pick more -- there are other links to other events that, in fact, make it significant because it's a repeat.

So I'm only saying that the significance determination process right now doesn't lead you necessarily to assess significance based on the fact that you have repeats, and those are very important because then we have programmatic issues.

MR. DAPAS: Well, if you recall, our enforcement policy previously had an allowance to address inadequate corrective action, which there are supposed to be actions to prevent recurrence.

But in looking at this and taking a step backward, one of the issues clearly that the industry challenged the NRC on, and ultimately Congress, was that our regulatory activities resulted in unnecessary regulatory burden. And I think, as an agency, we determined the best approach in trying to establish a uniform baseline to determine significance is using risk, and we came up with the significance determination process, and I think that needs -- there's additional modifications that need to be made to that.

But I think we concluded that going forward for initial implementation, that exercising that process and engaging, as a regulator, when thresholds were crossed, if that had been sufficiently established to ensure that plants are being operated safely while we continue to refine and further exercise that.

MR. GROBE: Any other questions on number three? Because that seemed to be a big focus of --

DR. APOSTOLAKIS: Well, I remember when we had a presentation on the significance determination process. It seemed to me there was a lot of room for judgment there and that's why I asked the question whether you are comfortable with it.

Given a certain finding, is it a routine matter to determine its risk significance or people are still learning how to do that is understandable.

MR. GROBE: The level one and level two reviews should be -- the staff should be capable of doing those. Our risk analysts had primarily gotten involved at the level two as we're learning and their workload has just been huge to try to help the staff learn how to use these tools.

When you get to level three, and our risk analysts are engaging with the licensees' risk analysts, you get, I think, a very highly defensible risk position. It takes a lot of effort to get there, several months worth of work has been our experience.

But the tools are still in the stage of development and as Mike and Sonia indicated, the level two worksheets, we just have pencil markups on them right now. But the tools should be effective and there is going to be a growing period where the staff learns how to use them.

But those tools -- do you want to comment on the adequacy?

MR. PARKER: Yes. I guess I'd say I agree with you, George. There is a lot of latitude there and we need to make sure that we apply the appropriate assumptions and that we can validate them and support them.

But in a lot of cases, it's very positive for the inspector because an inspector can sit back and say, hey, I've got an issue, I'm going to assume this equipment is out of service, and still results in an insignificant issue from risk, and he can move on without putting more resources into it based on that bounding assumptions.

So it could help the inspector out to move on, where, in the past, we might have pursued an issue to the end.

Now he can step back and say, hey, this is not risk significant, the licensee is addressing it, and he can move on to other issues.

But Sonia and I would work with inspectors, if they have an issue they believe, with some of their conservative assumptions, is going to come out to be potentially risk significant, then we'll try to make sure that we can validate those assumptions.

DR. APOSTOLAKIS: It appears, then, from your answer, that item number two would be affected, as well, in that you haven't really lost all the flexibility that you thought you had lost.

MR. DAPAS: Let me comment on that. This gets back to Dr. Powers' point about inspector flexibility. One of the things that, in Region III, we have attempted to communicate to the resident staff, as well as the regional inspectors and DRS, is that we've put people out in the field that we think have mature judgment, have experience, and if an issue that the licensee identifies or that we identify doesn't comport with your internal risk meter, you think there are issues there, we should ask those questions.

And as you screen that through the SDP and you look at the different assumptions, to understand why or why that is not a risk significant issue, and that's feedback that we would provide to the program office, if we think that the SDP should have an allowance to ensure that this issue screens out.

And that's got to be well supported, but that's where, in my view, the inspector judgment is brought to the table and says I think this is reflective of the licensee performance and I think we ought to have a way in our process to capture that.

Now, that might be in the context of a cross-cutting issue, that might manifest itself in a change to the SDP, but it gets back to we continue to refine this and we look at lessons learned, is there a particular issue that may be screened out as green that subsequently does manifest itself as a problem before you see a performance indicator threshold change.

We need to go in and look at that and say does that mean that the SDP needs to be modified. So I look at it as a continuing work in progress.

DR. APOSTOLAKIS: Now, this is done here, right? The SDP.

MR. PARKER: The phase one and phase two would be done at the sites or with the regional inspectors or with the resident inspectors and if it screens out to be potentially risk significant as far as the colors go, then Sonia and I would be involved with those activities at that time.

But we might be working with inspectors up front because they have some questions or difficulty.

DR. SIEBER: We had heard testimony a couple months ago about an incident at a plant, not in Region III, where the significance determination process was used by the staff and it screened green. On the other hand, there were two orders of magnitude difference between the staff's opinion of risk and the licensee's opinion of risk.

Are you prepared somehow or other to deal with a contest like that?

MS. BURGESS: The agency is part of the process of validating the SDPs. We've done the first phase, where we've actually sat down with the licensee and looked do we have the right mitigating systems down, have we implemented everything in your updated PRA.

The second portion of the validation is we would be going to the site with scenarios of a green-white threshold, something that would be -- an issue that would put it in a white issue, a potential risk significant issue, and we will have the licensee run it through their risk program, computer program, to see if they get the same answer.

We will also be looking for things that trip the green-white threshold from the licensee's computer program and then use our SDP to say are we getting a green-white threshold or are we still in the green and if we are in the green, yes, we do have a problem, we have non-conservative, and that's what we're trying to avoid.

DR. SIEBER: I think part of the problem there was not so much is the model correct or the process correct, but how the model was applied to this particular instance.

MR. PARKER: That's possible and that's what I think the new process makes -- makes it a little bit more comfortable, that we're supposed to be entertaining and having dialogue with the utility more sooner than we would in the past, where we would -- on a potential phase two, the residents, the senior reactor analysts will be talking with the PRA organization to try to understand how they've modeled it, they have more sophisticated models, and what did we miss or what perspective didn't we consider or that we might have inappropriately considered.

So we're trying to have that before we get to any escalated activities in those areas.

DR. SIEBER: Have you and the industry agreed on a set of rules as to how these things will be modeled or is this a case by case basis?

MR. DAPAS: Again, the SDP, I think, to answer your question, is a tool that the agency is using to determine the significance of findings, and we want that to be sufficiently conservative that we don't screen out something that has risk significance.

My experience with the pilot program and listening to discussions with sites and other regions involved in the pilot program is we concluded that an issue, say, was of white significance based on our application of the significance determination process. The licensee brought more detailed risk information to the table, with maybe a more sophisticated model, with different assumptions, where they had concluded it's not that significant.

So I've seen more examples of that versus --

DR. SIEBER: This is the one I cited as an example of that and I see that coming to a contest someplace down along the line if you get into civil penalty areas.

MR. DAPAS: But before we go there, before the agency is going to make a final risk determination, we afford the licensee an opportunity to engage us and explain here's the results of our analysis, and that's where the senior reactor analyst gets involved in phase three.

It essentially affords the licensee an opportunity to bring their risk expertise and assessment to the table and we would consider that. But ultimately we would have responsibility for rendering a decision on the significance and then take appropriate action, per the action matrix, which, again, be it a white issue or yellow issue, doesn't get into civil penalties. It gets into is it a cited or non-cited violation, if it's a regulatory requirement.

MR. PARKER: I think the burden is on us right now, though, and we need to be very careful in using SDP. As Sonia pointed out, we haven't validated it yet with the licensees. So it's a licensee -- if we have differing results, we need to step back and look at the reasonableness of theirs and why we have that discrepancy and make sure we're working with the program office and experts and the practitioners back in headquarters.

DR. SIEBER: There is some uncertainty, which could be quite large, going into all these things. The question is, is it really different or is the uncertainty so large that they actually overlap. That's the problem you'll have to deal with.

MR. DAPAS: And I think that's one of the most important aspects when the licensee brings their risk assessment to the table, is understanding the bounds of uncertainty and that gets back to the assumptions; that any risk conclusion is a function of the assumptions and that's something I think we wrestle with is the uncertainty.

DR. SIEBER: I see that as a challenge.

MR. DAPAS: Right.

MR. GROBE: I went to get back to the flexibility question, because I think that's critical to the ability of our programs to be predictive, and they're no longer predictive, and I'll use a case study, one that I'm familiar with, D.C. Cook.

D.C. Cook would have been green and for years they would have been green. Yet, we were never comfortable with their performance and particularly in the engineering area, and we applied a number of -- and this also gets to, I think, your question on lessons learned.

We applied a number of special inspections over a period of three to four years, including an operations safety team inspection, what we called a system operations performance inspection, which had an engineering emphasis, and then we re-allocated one of our architect engineering inspections to Cook, because we still weren't comfortable.

And it wasn't until we did that that we found the issues. Those wouldn't have been found and they wouldn't have been revealed, I don't believe, through our PIs, at least looking back in history.

There was a number of risk significant issues that were found after the plant shut down. This is some of the soul-searching we did and it was emphasized by Chairman Jackson at the time that we do this.

And we did two things, the lessons learned specifically on our inspection programs in the area of surveillance, because we didn't find the problems with the ice condensers at Cook, and it had to do with the way in which we were doing some surveillance testing activities.

But more importantly, from a programmatic point of view, we looked at how we were looking at engineering and that really resulted in a safety system design inspection.

We did not have as strong a design engineering emphasis in our program as we do today under the new program.

So hopefully that new design engineering emphasis will help us reveal problems like Cook that we didn't find, and didn't find until we did the architect engineering inspection.

MR. DAPAS: Just to clarify, we did do a feasibility study that looked at the inspection issues at Cook and what would that result in terms of the action matrix, but as Jack said, taking that back one step, would the baseline program have resulted in the identification of those issues in order to assess the significance, and I think that's, as he pointed out, the genesis of a more comprehensive look at design via the safety system design inspection, because there is the recognition that performance indicators don't provide you the information you need to really get a good assessment of engineering performance.

DR. SIEBER: Now, one of the industry initiatives is to change 303, I guess, so that you can change modes with something inoperable. And if you had an incident at a plant or a condition that's screens green and the licensee shut down, you now would have lost another tool to keep them down until they fixed everything, before they start up again.

What would you do in that instance?

MR. DAPAS: I'm not sure I fully follow the question.

MR. GROBE: Right now, if the licensee finds themselves in a situation where their technical specifications cause them to do something that is unnecessary, we have a process for dealing with that, the enforcement discretion process, and risk is a big contributor to that decision-making.

I'm not aware of this initiative to do away with

303.

CHAIRMAN BARTON: It's 304.

MR. CALDWELL: But that would require a change to the tech specs. I mean, if the agency decided to allow them to change modes without certain pieces of equipment, then you're right, we would not have a dog in that fight. We wouldn't be able to restrict them from starting up because of that particular component.

But as far as I know, that hasn't occurred yet.

DR. SIEBER: I'm thinking about where we should be coming from as this issue matures.

MR. DAPAS: The tech specs, as I understand, are to prescribe which equipment is -- whose operation is important to assure you can respond to any kind of transient or impact on the plant.

So if equipment is included in tech specs, the operability of that is --

DR. SIEBER: Where it is now is where it would be.

MR. DAPAS: Right.

MR. GROBE: Philosophically, it should be risk-informed, right?

MR. DAPAS: Right.

MR. GROBE: In which case, mode changes with risk significant equipment out of service shouldn't be committed.

MR. CALDWELL: I guess the big concern here would be if we did it generically. I think each plant would have to say they're -- not get rid of 304, but to actually pick out the components they think are no longer required for specific modes and then you would have to do a risk analysis for each of those components.

And if the agency were to agree, if the industry came in with a proposal that we shouldn't have mode restrictions based on equipment, then that would be a big concern, because you wouldn't have analyzed each component to see if it had a risk significance.

DR. SIEBER: The problem there is that most of those occur between the mode four and the mode three.

MR. CALDWELL: Right.

DR. SIEBER: Which there's not very many PRAs out there for that. So what do you use for the tool?

MR. GROBE: It's an interesting question, because most of the safety systems are required at mode four and yet they're not necessary to mitigate an accident at that mode.

MR. CALDWELL: But they -- you're right. It would be a philosophical discussion, because it is now a tool and a lever to make sure the plant is completely back in operation prior to changing modes.

If you allowed folks to wait until the exact time when he component was needed, then you're running up against clocks and some people would put it off to the last minute and others wouldn't.

Right now it works pretty good because licensees know, in their outage, that in order to come out of the outage, they have to have everything back and working.

DR. SIEBER: Right. There's no way out.

MR. CALDWELL: It's been, I believe, successful in terms of plants are operating better coming out of outages now than they had in the past.

DR. SIEBER: I agree.

MR. DAPAS: Moving on to, I guess, insight number four that we offer regarding the new program compared to the old program. The old program involved more direct observation of plant activities. Under the new program, there is an increased emphasis on inspection preparation and office review, with, of course, the exception of testing, where we do continue to have a number of direct observations.

I'll give you an example, like maintenance. Under the old program, we might observe the maintenance activity, like a pump rebuild, was the work procedure sufficiently comprehensive, are the steps being followed, et cetera.

Under the new program, we focus on has the licensee conducted a risk assessment for that particular, say, on-line maintenance activity. We would evaluate the effectiveness of that risk assessment and licensee control of the maintenance activity.

And I thought Laura Collins, who actually has been an inspector under both the old program and then involved in the pilot program, could maybe give another example in terms of the maintenance rule, because I know there were some questions that.

MS. COLLINS: We actually have two procedures that we look at maintenance. We have one that is called maintenance rule implementation and we have one I will talk about later, which is sort of our evaluation of their on-line risk assessments.

Under the maintenance rule one, which is the resident inspectors' largest number of samples and largest number of hours, that is largely a review of equipment problems that they have had and how they've dealt with them under the maintenance rule, and that's quite a bit different from our previous maintenance observation kind of inspection that Mark talked about.

So to me, that's a big distinct difference right there in the area of maintenance.

The other one is the area of operations, which we largely reviewed routine operations. Now we focus more on non-routine evolutions and don't look so much at the routine operations.

So those are just two examples of how we're not directly reviewing routine activities in the field.

DR. SIEBER: And that means much less observation of activities and more going through papers.

MR. DAPAS: The focus has shifted a little. It's understanding the licensee's evaluation of risk associated with that activity, their control of that particular activity.

Inspection preparation, the inspectors need to understand the risk importance of a particular structure, system or component, or evolution that's being selected for the sample, and that's where there may be more preparation involved in saying, okay, here is a specific testing evolution I'm going to observe because it's important from a risk standpoint, and then the preparation involved with going out and reviewing that activity.

But where that presents a challenge, that I'll talk about a little later, is the licensee may be planning to do a surveillance test tomorrow evening. The resident inspector spends time getting ready to observe that and then it's deferred and the inspector was planning to do another activity on Thursday of that week.

And we selected that specific surveillance test because it's more risk significant, where, under the old program, you could just pick another surveillance test and observe that.

The risk importance was less of an issue, and that's where it impacts inspection planning and resource utilization.

MR. GROBE: We're getting way behind schedule. I wanted to make one more observation regarding observation of activities. In addition to some of the resident issues, in the plant support area, EPHP and safeguards, it's had a very significant impact.

You can do the new safeguards inspection program from the guard shack. You don't even have to go into the plant. In the area of health physics, much fewer activities being observed in the plants as far as how they're controlling the activities from a radiological protection point of view.

In the EP area, during the programmatic inspection it doesn't require you to go into any of the emergency planning facilities. So you don't actually observe whether the facilities are in a state of readiness.

A lot of these are compensated for through the PIs, the performance indicators, but in some cases, not very well.

So there has been a shift from reviewing activities that have already occurred through looking at the paperwork to -- and away from direct observation in the plant.

DR. SIEBER: How do you feel about that?

MR. GROBE: Our inspectors are not as comfortable with that as they were in the past.

DR. WALLIS: I'm wondering of the public would be as comfortable with that.

MR. GROBE: It's a new program and it's dependent on multiple prongs. One of those prongs is performance indicators and another one is effectiveness of the licensee's corrective action system. So we're putting our eggs in different baskets and we need to see how it works.

MR. DAPAS: But, also, when you look at the particular inspection procedure, there's associated objectives which are supposed to result in our acquiring the information we need, and that can be arrived at via direct observation or review of, for example, the licensee's control of the maintenance evolution.

The key is do you obtain the information you need to make an informed judgment, from my perspective.

MR. CALDWELL: There is an ongoing feedback process. These particular issues that Jack talked about are issues that we've fed back to the program office and will continue to feed back.

So I expect to see some changes to the program after the first year of implementation. So maybe a year from now, we can talk about it again and see where we come out on this. These are just early observations.

DR. SIEBER: Have you made your thoughts known to the headquarters?

MR. CALDWELL: Certainly.

MR. GROBE: We do that and we've been rather proactive I that regard. I think we've pretty much covered item number five. Why don't we go on to item six.

MR. DAPAS: Regarding inspection resources, as we've touched upon, there was more flexibility under the old program, in a couple aspects.

In addition to the inspection scope, where we talked about how prescriptive that can be under the new program, we had more opportunity with use of regional initiative, we had N+1 inspector, where you could use that particular inspector to conduct some regional initiative in the area of operations. There was more flexibility with tapping DRS engineering resources to go out and do some regional initiative inspection.

Now, under the new program, that DRS resource and that former N+1 resource, which now may be assigned to the region, is fully encumbered by the new program. So there's less flexibility in that regard, which, of course, again, was by design with the new program and the inspection scope.

But when you have extended absences or vacancies, that requires back-filling the complete program, and so that results in a greater degree of sophistication in inspection program management. The branch chiefs out in the audience can tell you that they have to plan hours in detail for, say, a six-week inspection period so they can readily identify where there are holes and you can't -- you can only defer some inspection to a limited degree, because that creates the bow-way that you're going to have address during the next inspection period.

And when you have sample size ramifications, the number of activities that you need to look at per month, that's where that becomes an issue.

So we have to have contingency plans in place if we're going to support a rotational assignment to another program office or we've got a vacancy at a particular site because the individual left for a promotional opportunity or reassignment to the region.

In order to implement the new program, we've got to have two fully engaged people at the site. There is some flexibility there, but not a lot. Frequently, you will hear a branch comment that I need some help during this time period because inspector X is going to be involved in this activity, and it causes is to continually focus on what are our priorities and what we can support, because we don't have the latitude right now of saying that we have completed the baseline program with this amount of inspection, like you could under the old program with the core inspection hours.

MR. GROBE: I think as far as public awareness, we are greatly aware that the public is taking opportunity, taking advantage of the web site information that's available to them. The PIs are on the web. Our inspection reports are in the web, and that is a significant improvement over the --

DR. WALLIS: It's on the web. Do you have a way of counting how many people -- how many times it's actually looked at?

MR. GROBE: Actually, Augie Specter counts it and reports on it regularly, in thousands of hits. I can't remember what the numbers are.

DR. WALLIS: They actually stay with it. They don't just hit and leave.

MR. GROBE: The question I got is how many of those were Augie logging on. But he's counting those. And I headed a public meeting out at Cook, a lady who called herself Auntie Nuke, who had downloaded a lot of stuff off the web. So the public is taking advantage of it.

DR. POWERS: One of the things I find -- items that show up that say, in effect, management is very well prepared for the safety review, to be as helpful for me to understand the plant as those that say the operators didn't handle the jumper control very well.

The upside and the downside are very valuable to me. Now it sounds like the upside is going to be disappearing.

MR. GROBE: No, it's gone.

DR. POWERS: It's gone. And somehow I worry about the communication aspect, to me and everybody else.

MR. GROBE: We all shared your concerns, but it was the view of the industry that that's what they wanted from the standpoint of communication in our inspection report, and, by definition, that's what goes into the PIM and goes onto the web.

MR. CALDWELL: Well, our observations and findings that go into the PIM are supposed to be risk-informed and it's very difficult to risk-inform the positive. So you wouldn't be able to do what you might like to do, and that's come up with a balance. But a positive comment would weigh as heavily as a yellow or a white finding, in which case a positive comment may have little or no safety significance. There is no way to evaluate that.

So the decision was made to just --

DR. POWERS: Philosophically, George, I think he's hit upon a flaw in this PRA technology.

DR. APOSTOLAKIS: No, it has not been used.

DR. POWERS: It only gives us good ways to quantify the negative and no good ways to quantify the positive.

DR. APOSTOLAKIS: That's what we have done so far, but one can actually say that because they're doing such and such, the human error probabilities that were assumed in the past are actually lower, so there's a positive impact on plant safety, or that the failure rates are expected to be on the lower side.

DR. POWERS: Your problem is one of communication, George.

DR. APOSTOLAKIS: Why?

DR. POWERS: That I can understand, well, a number going from three to four, as in times-ten-to-the-minus-fifth.

DR. APOSTOLAKIS: But not from three to two?

DR. POWERS: But the other way, the positive -- I mean, how do I understand going from 99 to 99.9?

DR. APOSTOLAKIS: It's just that we've never used it that way.

DR. POWERS: That's right.

MS. BURGESS: But I think you can understand that if a licensee puts -- adds another diesel, then I think everyone can understand they have decreased their risk. So those kinds of things can be put into our report.

DR. POWERS: He tells me all the time that I can't assume they've decreased their risk.

DR. APOSTOLAKIS: I think that's a good point, but we can say something. The thing is we've never attempted to say how improving things, if we're finding the good things. I wanted to say something, but Dr. Powers destroyed my thinking.

DR. POWERS: I've been successful again today.

CHAIRMAN BARTON: Yes. Before this deteriorates further, do you want to continue?

DR. APOSTOLAKIS: He probably can't even remember. If everything is green, that is a message, right?

DR. POWERS: I insist that that's a degraded message.

DR. APOSTOLAKIS: And that's why people are trying to --

DR. POWERS: When everything is green, then you start looking at what are the shades of green and you see these things where guys plot where they lie on the green band and people start paying attention to that and not paying attention to the fact that it's green.

MR. GROBE: What's interesting is green is not good. A green finding is a finding. If you have 100 green findings, that's not better than having one green finding, that's worse, because that might be indicative of a systemic problem.

And the colorization, I have a lot of problems with these colors.

DR. SEALE: Amen.

DR. APOSTOLAKIS: So the ideal is no findings.

MR. GROBE: Well, no. If we have no findings, my concern would be that the inspection program is not functioning effectively.

MR. CALDWELL: The idea should be that we're an active regulatory body, we're inspecting, we're having findings. The findings are not such that it's outside of the industry response band, which means it's staying within a band that we're allowing them to correct their problems.

That is a plus or minus, however you want to look at it. If they drop out of that band, then people can ask questions about their safety.

DR. APOSTOLAKIS: But this raises, again, an issue that is a favorite of mine. I've raised it several times, but I don't know that I got a response.

CHAIRMAN BARTON: So you're going to try again anyhow.

DR. APOSTOLAKIS: Yes. What is the purpose of these inspections? I mean, there are two alternatives, in my mind. One is to make sure that the risk profile of the plant, as we're understanding through the IPE and PRA, remains the same, especially hasn't shifted upwards. So that's a plant-specific finding or determination.

The other is to look at it as one unit in the population of 103 units and see whether you are -- I mean, that particular unit is within the industry norm or it's a percentile. These are two very different things.

And the third one, I guess, is to make sure that the licensing basis is still met, which is not -- it is related to the risk profile, but it's not the same thing.

And I'm not sure that the designers of this process really articulated very well what their objective was. In some instances, I get answers that, yeah, it's industry-wide, we're very interested in what's happening, is this an outlier or not. In other cases, no, we really want this plant to remain the way it was risk-wise.

So what, in your opinion, is the objective of all of this? I mean, we have a risk profile, we have in the PRA, you do all these determinations such as PIs and the action matrix and so on, because that's related to the green now, because if everything is green and I can conclude that the risk profile has not changed, then things should be all right.

Because then I get into the business of how many greens do I have, how many findings, one versus 100.

MR. GROBE: Possibly. I wouldn't suggest you count findings, but what's important is to understand the root cause of the findings and what that root cause can do to the risk profile.

DR. APOSTOLAKIS: So the potential for getting out of the green.

MR. GROBE: Exactly.

DR. APOSTOLAKIS: That's what you worry about.

MR. GROBE: Exactly.

DR. APOSTOLAKIS: But have you any idea as to what the intent of the oversight process is?

MR. DAPAS: Both aspects are addressed. When you have a particular inspection finding, that's got to be placed in the appropriate context of a given plant configuration. You have to bring plant-specific PRA knowledge to bear.

I think the performance indicators address that across the industry, where if we set a threshold for number of scrams that would result in regulatory engagement, that threshold is a function of overall industry performance.

DR. APOSTOLAKIS: And it shouldn't be, in my view.

MR. DAPAS: That may be a few, but that's at least my understanding of the intent of the program.

DR. APOSTOLAKIS: The inspection findings are plant-specific, but the PRAs are --

MR. DAPAS: Well, the PI is plant-specific, if you will, in terms of you had scram X, you had transient X, but the threshold --

DR. APOSTOLAKIS: It's an industry --

MR. GROBE: And the same thing with inspection findings in the SDP. The base risk profile of a plant might be five-ten-to-the-minus-five, it might be one-ten-to-the-minus-seven, but the threshold for a green finding is ten-to-the-minus-six, no matter what the base PRA of that plant is.

DR. APOSTOLAKIS: But, you see, the fact that the thresholds are so high has made the utilities themselves to have more stringent plant-specific thresholds for internal use.

MR. DAPAS: Right. And the reason for that is because we told the industry they shouldn't be using our PIs to manage their plant. I would expect them to have more restrictive, if you will, indicators so that they can address problems before it does cross the threshold.

MR. CALDWELL: That goes back to what Marc had mentioned earlier. The basis of this program is an effective problem identification and corrective action program on the part of the licensee. So they have to have in place their performance indicators or whatever they think is necessary to identify their problems early and resolve them before they become bigger issues.

That is what we are relying on. We have to see now if that works or not by implementing this program and see how well the licensees' corrective action programs -- how effective they are.

DR. BONACA: But you said before that D.C. Cook would have been all green.

MR. GROBE: It was all green.

DR. BONACA: So there would have been no signal coming from the indicators for action. So does it mean that the action at D.C. Cook was successive or does it mean that the indicators really have been a big help?

MR. CALDWELL: I missed that conversation. I think Jack is saying the performance indicators may have been all green. I'm not sure our inspection findings would have been all green. Our inspection findings likely would have been something other than green.

DR. BONACA: So you didn't check for that.

MR. GROBE: No, we did. We ran all the LERs and findings prior to the outage through the -- at that time, it was a very preliminary draft SDP, and didn't come up with any significant findings.

I don't know if we came up with any whites, but it wasn't until after the outage that you started seeing yellows and reds.

The point I was trying to make was that the level of resource expenditure that we put into Cook, we would not be able to do today. And somebody earlier mentioned that the program is more indicative than predictive, and that's true. We have less capability of being predictive, unless the thresholds are crossed with a specific finding.

MR. DAPAS: And that gets back to, if you recall, our discussion with the Commission. One of the fundamental premises that the industry proposes is that performance indicators would be crossed, threshold changes before there is a significant programmatic concern that manifests itself.

Right now, I think there are some differing schools of thought and that's why the role of cross-cutting issues, I think, has played such -- the importance of that has been elevated.

There is a task force that's looking at human performance and corrective action programs and safety conscious work environment, cross-cutting issues, because not everyone full ascribes to this tenet that you will see performance decline clearly manifested in the PIs before you see risk significant inspection findings.

DR. POWERS: The committee has advised the Commission that we consider that an assumption that needs to be validated. You're only reinforcing that opinion.

MR. GROBE: The lunchroom across the way gets busy at around noon.

MR. CALDWELL: What we're doing is we're having --

they're bringing over sandwiches and some salads.

CHAIRMAN BARTON: We'll just keep going then.

MR. CALDWELL: So I can let you know, it's $10 a person, and we should be bringing -- we'll bring a table in right behind here and you can go over and pick up and eat as you wish.

CHAIRMAN BARTON: Excellent. I'd like to get through the SRA process before lunch, then we can take a break, if we can get to it.

MR. DAPAS: I've just got one point left to make on the public awareness. I think clearly there has been a public outreach effort associated with the new program, industry workshops, et cetera, which I think is a positive initiative.

We have touched upon the DRP --

DR. WALLIS: Well, public outreach, how broad is the public that gets involved? Public outreach, how broad is the public involved?

MR. DAPAS: We've invited, like, for example, when we've conducted meetings on the new program and we're going forward with meetings at each of the sites within six months of initial implementation. Certain officials, et cetera, we're inviting, but it varies, the degree of public attendance.

We're trying to advertise that via web and other communication forums, but it does vary.

MR. GROBE: We don't see a lot of public awareness -- public involvement.

MR. DAPAS: It depends on the site.

DR. WALLIS: Public should not consist only of people with some personal interest, like an economic viability of their plant.

MR. DAPAS: Right. Right.

MR. CALDWELL: It's strictly -- I think it's strictly related to how interested the surrounding area is in that plant and most of our plants do not have active public involvement. So when we have these meetings, they are not widely attended.

But we do put out a lot of announcements to that effect and people could attend, if they wanted. And I suspect if there was an interest, like one of our facilities, Prairie Island, there's an interest in dry cask storage. And so we always get a pretty good attendance at those. But it's really related to how well the public - I look at it this way. If you don't get a lot of public attendance, that means that they feel comfortable with that plant as it is.

Otherwise, they would be coming to the meeting to try to understand or express their views.

MR. DAPAS: My comment was more in the context of the old program, where really the only public outreach, I would offer, was a meeting to discuss SALP results, versus a more concerted effort.

I've touched upon some of the DRP challenges here. One of the challenges we face, of course, is feedback and dissemination of lessons learned on the new program as we attempt to further revise that, and there's a number of forums for doing that.

We've got feedback forms, weekly conference calls with the program office, inspector seminars, and then, of course, DRP/DRS counterpart meetings, where Jack and Mike and Geoff Grant attend to discuss some issues with the new program.

DR. WALLIS: One measure of success might be that there were lessons learned which were useful when you actually look back at it.

MR. DAPAS: Right. Which gets into the self-assessment area. We have been given an opportunity to weigh in and comment on the self-assessment plan development, which includes appropriate metrics, and this is in support of the IOU we have to the Commission to evaluate the new program and report to the Commission in June.

And headquarters is currently involved in our inspection report review to help ensure consistency and we do plan public workshops to obtain feedback, which was fairly well received in the pilot program.

Unless there are any questions, that pretty much summarizes DRP's involvement in the new and old programs.

MR. GROBE: Let me just highlight one challenge that we're going to be talking about a little more later, I hope, in the Division of Reactor Safety. There's a number listed here, but the one that's most significant for us is a change in required expertise.

We depended heavily on contract resources when we needed design expertise in the past. We no longer have the financial resources to procure contract resources in that area.

So that's a challenge for us. It's a staffing challenge. It's a recruiting challenge, and we're trying to meet that and we'll get into some more detail later.

The other issue is risk analysis capability and why don't we just go right into the risk presentation that Sonia has prepared.

MS. BURGESS: Here's a little background. In October of 1995, the SRA position was developed to assist the agency in transitioning to a new risk-informed arena in the way we do business.

I don't believe that in 1995 the Commission realized what a large leap we were going to make ultimately into getting our whole process into the risk-informed arena.

Fortunately, when the transition, the pilots, the new reactor oversight pilot program started, the SRA program was fully staffed in all of the regions and we were fully trained and qualified and certified.

I think that has been a big asset in the success we have had in implementing the new reactor oversight process.

Some of the bullets highlighted here are just some of the key things that we do here in the region. Our biggest role right now is to support the new oversight program.

We were very much involved in the development and the implementation of a pilot process here in the region and we sat on a lot of committees, helped in reviewing many procedures, things of that nature.

Our main support now is in the SDP arena. As has been brought up, Mike and I have visited every site in our region, because we think it's imperative that these SDP tools that we have been giving to the inspectors are accurate, that the licensee agrees that they're accurate, and that they are -- although simplified, they are the best tool that we have produced to date.

DR. POWERS: The question that often comes up, to my mind, is the scenarios they have are very simplified. Are they simplified by intent or out of necessity?

MS. BURGESS: The scenarios on the SDP worksheets, like the loss of off-site power?

DR. POWERS: Right.

MS. BURGESS: I think, yes, they're definitely simplified out of necessity. We certainly do not have the resources of the capability to model 50 initiating events and that's typical of a licensee's own PRA analysis. So we have narrowed it down to probably ten to 12 initiating events. Has there ever been a demonstration that -- with some rigor -- that narrowing it down to these ten or 11 events constituted an adequate description of the risk profile of the plant?

DR. POWERS: Yes. And in our site visits, along with the other regions, these scenarios, these initiating event scenarios have captured the majority of the risk contribution from their PRAs.

MR. PARKER: I would also add that we started out with, I think, four to six initiators and we did some pilot activities with the program office. One of them was one of our plants in the region.

We went there and tried to do some V&V by taking some scenarios, some major systems and correlating it with the licensee's PRA and we found some non-conservative in ours, where the licensee identified it as a fairly high risk activity.

And that's where we had to step back, as an agency, and I think it set us back several months, trying to identify additional initiators that were necessary to truly capture the majority of the risks, as Sonia says, that we are right now, that we were able to pick that up.

DR. POWERS: I might be willing to concede they captured the CDF. The question is, did they capture the risk.

MR. PARKER: That's some of the -- I mean, right now, what we're looking at is internal events and some of the difficulty we have in using the tool is we don't have an effective took in place for containment, for shutdown, for external events. So there's a lot of -- the majority of the risk is still being captured through screening tools that we're trying to put in place right now and when we have those type of issues, that Sonia and I have to get involved with it, we have to get involved with the licensee's IPEEE, and we have to work with headquarters in a lot of cases if it involves external events, it's just a screening basis in IPEEE.

So we might not be able to capture all that ourselves.

MR. DAPAS: A good example of that is a recent issue we had at Quad Cities with -- what is it, Marc -- safe shutdown makeup pump and that being unavailable and how you bring the external event fire risk into play. There's not a tool used. We used risk achievement worth, I think, and CDF to come up with an overall risk assessment.

We discussed it as part of the significance determination panel. We communicated that to the licensee as the most appropriate tool we have right now and then the licensee is going to come to the table with their assessment of the risk impact in terms of fire risk.

DR. POWERS: So you don't even have things like five available to you.

MR. PARKER: No.

MS. BURGESS: No.

DR. POWERS: One of the -- an anecdote, to which I've never had a resolution, is I believe it's Brown's Ferry that uses ORAM for outage management and they were showing me how it worked. I know a little bit about ORAM.

And they said, well, look for this particular outage, we set up a configuration that had this red region and by manipulating things around, we were able to change the way we did our outage, so that instead of having a red region and everything else green, we had two orange regions and everything else green.

And I have puzzled and puzzled to understand how one concludes that two oranges is better than one red.

MR. PARKER: That, I think, is some of the difficulty in ORAM, is it's mainly a deterministic tool and you're looking at defense-in-depth and most utilities don't have a probabilistic shutdown model.

I think some of the plants are going there and we might be able to look at it a little closer, but you pointed out some of the difficulties we have with our tools. The licensees are trying to suppress and reduce their overall risk and from their perspective, they didn't enter a red, which was prohibited, and it's very subjective and that's decision-making.

DR. WALLIS: When you compare with the licensee's PRA, you just compare with the results or you compare with the details?

MR. PARKER: You're talking about SDP?

DR. WALLIS: Yes.

MR. PARKER: When we're looking at findings?

DR. WALLIS: Looking at your model versus the licensee's. You have a simplified model. How much of his PRA do you have access to?

MR. PARKER: We have very little access to most of the PRAs, but when we did some of our benchmarking, we wanted to get the cut-sets and the importance from there so we can extract that and figure out what were the dominant cut-sets that were affecting our SDP model.

DR. WALLIS: It's a peculiar kind of detective work, or maybe there are some assumptions made that you don't know anything about.

MR. PARKER: That's right.

DR. WALLIS: Which is reducing the licensee's result. Don't you have a way of finding out what they are?

MS. BURGESS: Only if there is an issue or a finding in that. I mean, we don't have a PRA inspection.

MR. PARKER: I think you're stepping back to what I would call the infrastructure. We still haven't even established a PRA certification. But on the other hand, we are basing our SDP as closely as we can to the licensee's IPE or their updated PRA model, and we haven't validated that model yet.

So I understand and appreciate your comment and I think the agency is pursuing that, but, again, we're progressing slowly. Maybe there's different things we need to prioritize in this arena, too.

MR. DAPAS: There is a conceptual issue here, though. I think we -- if a piece of equipment is failed or unavailable, we run that through the SDP, we communication the results of that, then the licensee can bring to the table more risk-specific information from their PRA.

Now, obviously, when we've got an issue and we're running it through the SDP, the licensee is doing the same thing, because they understand the SDP, we've communicated to them, 0609 defines specifically what that SDP tool is.

If it looks like this is going to screen out as a white finding, they're rather proactive in communicating to us their assumptions and what their PRA model says. So there is that dialogue.

DR. WALLIS: Assumption is the key word, because assumption really is not worth anything unless it can be challenged and defended. And if there is some mysterious assumption you don't know about, that's like magic. It's just like getting whatever you want.

MR. DAPAS: We should challenge that.

MR. GROBE: Your point is very good, and that is that we don't know what the assumptions are in the model. The IPE that the staff reviewed a number of years ago was many generations earlier than what is currently being used at the sites.

So to a large extent, we have to depend upon the -- that there has been an intelligent evolution of the model that the licensees use.

DR. BONACA: On the other hand, the event, whatever you're evaluating, it's a fact. So you know what you're going to check inside the model. It's not hypothetical issues.

In general, you may question their assumptions in the model to represent the --

DR. APOSTOLAKIS: Do we --

DR. BONACA: But now the fact that you have a specific event happening, it allows you to go back and verify the assumptions.

MR. GROBE: But they don't have it here. Is that part of the SDP, the phase three?

MS. BURGESS: Phase three. Phase three will challenge the licensee's assumptions, where we're different, and take a look at what their program does, what their assumptions are, and the validity of those assumptions.

DR. APOSTOLAKIS: What, in your opinion, would be the ideal tool that should be available to implement a risk-informed regulatory system, especially the oversight process? What would you like to have?

MS. BURGESS: Personally, I think that some kind of standard for a PRA is just essential.

DR. APOSTOLAKIS: But you would also like to have a plant-specific PRA on the computer.

MR. PARKER: Right now we have safety monitoring and I guess my perspective is to be able to have access to the licensee's plant models and be able to manipulate them and understand them. But we need to start where Sonia says, that we certify your PRA or have some level of certification to say this PRA meets certain thresholds and standards.

DR. APOSTOLAKIS: Let's take a specific plant, like Davis-Besse. What PRA information do you have?

MS. BURGESS: In fact, I was there two weeks ago to do their SDP worksheets. They have gone through an extensive PRA update. Prior to my visit, the only thing we had was what was documented in late 1980s.

DR. APOSTOLAKIS: But do you have --

MS. BURGESS: We have the docketed IPE here, which is --

DR. APOSTOLAKIS: The PRA as they changed it.

MS. BURGESS: I was able to bring back, from my visit of two weeks ago, the executive summaries, some of the system notebooks that are used in the service water systems, component cooling water. I was able to get risk achievement worth, a lot of importance measures of systems, things like that. They give us a better idea of how they have changed their --

DR. APOSTOLAKIS: I don't understand why they don't give you the whole PRA.

MR. PARKER: Because we haven't mandated it. It's not required through the regulations and no utility --

DR. APOSTOLAKIS: The risk achievement worth is not required either.

MR. PARKER: I understand, but I guess what -- you said this is our chance. I would like to see us have some type of requirement or standard where the utilities are providing us their routine updates, no different than they would on an FSAR. That's a difficulty we're having right now with our SDP tool.

The SDP tool was put together by BNL, Brookhaven National Lab, using the IPE and the SRAs are having to go out and reevaluate that based on the licensees' current models. So significant changes are taking place.

DR. APOSTOLAKIS: We have been told by some licensees that they have -- especially the ones who have risk monitors -- they have PC versions of their PRA, they can see the impact of the change within a minute.

MR. GROBE: On-line risk monitor.

DR. APOSTOLAKIS: Sure. Would you like to have something like that?

MS. BURGESS: Yes. Now, we do have -- like Mike said, we do have safety monitor. Unfortunately --

MR. PARKER: We have the program.

MS. BURGESS: We have the program and we have the eight models, which are like the Westinghouse tool for a Westinghouse four-loop or things like that. We do not have plant-specific models.

Now, some plants in our region -- as a case in point, Kewaunee has given Research their program, their model, and Research has given it to INEL and INEL is in the process of converting it to SAPHIRE. So we have their actual model.

DR. APOSTOLAKIS: Now, wouldn't the SPAR models eventually meet the needs you have when INEL completes --

MR. PARKER: I think there is a potential that it could meet most of our needs. The difficulty is going to be they're working on low power shutdown models. They're working on some containment and those have -- a lot of that activity has been deferred because of the SDP activities in progress that we can't -- we weren't able -- there are competing resources.

So I don't see us getting there for several years.

MR. GROBE: We're significantly resource constrained.

DR. APOSTOLAKIS: But you mentioned that the licensee is under no obligation to give you the PRA. But isn't it in their best interest to do that?

MS. BURGESS: We believe it is.

DR. APOSTOLAKIS: I mean, if they want risk-informed regulation, we can't do it without risk information.

MR. GROBE: We've been able to encourage several licensees, just from an efficiency point of view, of interacting with the staff, encouraged them to give us some of their risk analyses.

The problem is, as Sonia and Mike have pointed out, one, is that there is no standard. So you have widely differing approaches, and second is there is no requirement to provide it.

So it's only a phone call from Steve or myself that says, listen, our interface would be much more efficient if we had such and such and then we'll get some documents.

DR. WALLIS: I'm not sure you need the standard. If I look at thermal hydraulic codes, it used to be that the staff would simply look at some codes provided by licensees. But now in reviewing thermal hydraulic code, the staff is moving to the position we want the code, we want the source code, we want to be able to run it, we want to be able to try things with it and see what it does.

MS. BURGESS: Many licensees are very reluctant to put their updated PRA on the docket.

DR. WALLIS: But ideally that's what it should be. It should be completely open.

MS. BURGESS: They just do not wish to have it on the docket.

DR. POWERS: If you can think about the headaches it would involve when it's updated, it's a significant process.

Let me ask you. You've mentioned this need for certification a lot and there is an activity going on with the standards committee to set the standard for the PRA, and I think NRC has a limited voice in that committee setting that up.

Do you have a voice with those representatives on that committee?

MS. BURGESS: The regions?

DR. POWERS: Yes.

MS. BURGESS: No, we don't have a particular voice. Research is the member of that committee and I would characterize their participation as much more than just a minor committee member.

DR. POWERS: Mary Drouin and her troops.

DR. SEALE: That confirms what we found out from them last week.

MR. DAPAS: We're not precluded from providing input there. If Mary Drouin is the representative, I've worked with Mary, I know Sonia. We'd have no problem calling her up and saying, hey, we think this needs to be considered.

So we are not precluded from that opportunity, but there is not an outreach effort, if you will.

DR. SEALE: You're not getting timely information on what the status of that -- the evolution of that so-called certification process.

MR. DAPAS: Nobody else is either. Other than what I read in the PRA implementation plan updated Commission paper.

DR. POWERS: It seems to me that -- I think there's a wealth of information at that tend of the table on what the minimums ought to look like, just because of the pain, it's knowledge that's been gained by pain.

I'm wondering if we can't find a mechanism to do a download so that there is some hope that maybe that gets represented in the standard, because the last thing you want to do is get a standard back that's no good to you, that doesn't standardize the things that you want standardized.

DR. SIEBER: It's harder to undo that kind of a thing than it is to write it in the first place.

DR. APOSTOLAKIS: Will you have an opportunity to comment on the ASME standard? I mean, the public is welcome, so you are welcome, too.

MS. BURGESS: I believe the region will have a --

MR. PARKER: More than likely, Research has been very accommodating in requesting our resources to comment and provide feedback to all the new inspection processes and generally the NUREGs that are coming out, too. So I would see no difference in this regard.

DR. APOSTOLAKIS: There is a workshop, as you probably know, on the 27th of this month. Do you plan to attend?

MS. BURGESS: No.

DR. POWERS: They've got more than they can keep up with as it is.

MS. BURGESS: Yes. We've been very busy.

MR. DAPAS: But, George, not to convey we don't think that's an important activity. Like verification and phase two workshops we think is a high priority, as well, so that we can ensure we're capturing the licensee plant-specific information.

So there's competing priorities we're trying to wrestle with.

DR. APOSTOLAKIS: Is it fair to say that we risk-inform the regulations with very limited risk information on our part?

MS. BURGESS: Yes.

DR. POWERS: When you look at this risk-informed regulation, only a third of it is risk-informed. The rest of it is something.

MR. GROBE: It's all risk-informed, it's to a degree.

DR. APOSTOLAKIS: It's not quantitative.

DR. POWERS: This is the argument I sometimes make with the gentleman to my left and say we've always done risk-informed regulation, we didn't write these regulations because we didn't think there was any risk there.

DR. APOSTOLAKIS: That's right, and I have been persuaded, as always when I hear a reasonable argument.

CHAIRMAN BARTON: All right. Where are we here?

DR. APOSTOLAKIS: I think Sonia is telling us -- the last four bullets, we understand that you're doing that. Do you want to move on to --

MS. BURGESS: One initiative that we actually -- I did want to make a point, the initiative that we are doing that we are going to -- we're doing outage risk assessments. The plant is in an outage, Mike and I will go out to a site, sit down with the scheduling people of the outage from the licensee, understand where their risk significant evolutions are and helping to focus the resident staff on what to look at out, what to be observant of, what the most risk significant issues and evolution is.

DR. POWERS: Do you have an understanding of what the risk significant evolutions are during an outage, can you tell me?

MS. BURGESS: Quite honestly, I think that our new inspection procedure for outage work is pretty good on hitting PWR/BWR risk significant evolutions, from a broad perspective, to give, I think, excellent guidance to the resident staff.

DR. POWERS: I'll look at it.

MR. GROBE: What we found is that the licensee's risk analysts aren't getting involved early enough in looking at the outage plan. We have been prepared to go out and look at the outage plan and the risk analysts, in some cases, haven't even started looking at it.

Are you asking the question because we haven't really developed a shutdown risk model yet?

DR. POWERS: The committee has had the chance to review a proposed rule in the area of shutdown regulation, and rejected it, fairly sternly, on the basis that we didn't feel like we had risk information about shutdown sufficient to know what to regulate, and asked that Research undertake a study to develop a risk profile during shutdown operations, not only planned outages, but unplanned outages, as well, and that has not progressed.

So as a result, I don't have the kind of information base of what constitutes risk-significant evolutions during outages that I have for normal operations gained from things like the beginning of WASH-1400 and up to NUREG 1150, and even the IPE insights document I find a wonderful source of information about what is risky in a plant during operations.

But I don't have that for outages. I've got a huge inventory of, which I seem to now have a hobby of collecting, of incidents that occur during various types of outages and I know the kinds of things that get you in trouble and I'm sure I could write a regulation to make sure those things never happen again and I find, in general, they don't ever happen again, people correct things.

But I don't have a feeling for how you get into these problems and what kinds of things to look for.

MR. PARKER: And you bring up a good point. That's what we're trying to do is look at those issues, those risk insights that we have some knowledge on, but we're using the tools defense-in-depth and some of the NEI guidance to say, hey, mid-loop operation and different operations like that are highly risk significant conditions and that's the one tool we have.

But to go back to your point, the one opportunity that we have is Perry is developing the shutdown model and they intend to put that on their safety monitor, where they will be able to have a probabilistic on-line risk monitor, and it will be very interesting to be able to tie that into their outage coming up next February.

But they hope to have it in place so they can use it for their outage planning activities and that will be a unique opportunity for us in the region to be able to see if there's any insights that come out of that and share it with other plants.

DR. POWERS: I think these things are all good. I wish that you would have the kind of data that's in the PRA community about the details of these models, because I know that we have substantial questions about how you go about modeling human error in these kinds of situations, which are very different from operational situations.

And I don't see the kind of debate between gentlemen, such as on my left, and his peers on how you go about doing that modeling that I have seen in connection with operational events and see the way that you set up the structure, the fault trees and event trees for shutdown events and the detailed discussions and the philosophy that I see for operational events.

And so these things get created, I'm glad, and they're going to help a lot, just like you said, but I would -- I'm not sure they raise my comfort level an awful lot.

MR. PARKER: Well, that's what stirred up my interest as far as certification. When we went out and did the SDP activities, to look at some of the human performance that we're crediting in our SDP that we have generic values, ten-to-the-minus-one for a high stress and ten-to-the-minus-two, and then we see the utility call it a ten-to-the-minus-four for the same thing, we haven't validated that and we're very uncomfortable and headquarters is stepping back and looking, is it appropriate to use the licensee's numbers versus ours.

And when we have an issue that results in a human performance, how do we deal with that and where do we go; do we step back and look at the licensee's assumptions and their basis and validation behind that.

So there's a lot of questions in that area where human performance becomes a real issue.

MR. DAPAS: That underscores the need for some type of standard, in my view. From my perspective, your comments are clearly valid about we have limited risk-informed our processes. You're attempting to use the tools you have. If the licensee is proactive, like they are at Perry, you want to learn from that.

I think in the interim, though, we've tried to come up with the SDP, recognizing its limitations, and we have some tool to use to assess significance until we maybe develop some standard where the licensee says here is my PRA and we have confidence that it's sufficiently rigorous and we can use that in our determination of risk.

Right now, we have this --

DR. APOSTOLAKIS: But will the licensee say here is my PRA?

MR. DAPAS: They don't have to right now.

DR. APOSTOLAKIS: So does the Commission know that you are a little bit constrained in your efforts?

MS. BURGESS: Yes.

MR. DAPAS: I hope so.

DR. POWERS: They should understand the

limitations of the SDP.

DR. APOSTOLAKIS: But, I mean, in order to understand -- if we are the only ones, it doesn't work.

DR. POWERS: They have asked for us to talk to them on the SDP, on whether the PIs are truthfully risk significant. I don't think they're ready for the answer we're going to give them. And since I get to be the messenger, I may be dead next week.

MS. BURGESS: Slide 28 just highlights three bullets, that the SRAs in the region are extremely involved in the new process, very active and very busy just resolving findings and issues that inspectors from DRS and DRP are bringing to the table, running through the SDP process.

Since these worksheets are not yet completed, done with the revisions, the SRAs are involved in almost every issue.

DR. POWERS: I understand people are looking into expanding the workforce of SRAs.

MR. GROBE: We can talk about that a little bit.

MR. DAPAS: That's one of the staffing challenges Jack mentioned.

MR. GROBE: Yes. Could we hold off on that?

DR. POWERS: Sure.

MR. GROBE: Because we have another staffing issue. There is one thing we haven't touched on with Mike and Sonia that we talked about briefly earlier was how the SRAs and risk analysts are going to get involved in event response. We've only had one substantive event since the new program went into force, and that was at Palisades.

And what we found was that there was a disconnect between management's expectation of what could be provided and what we actually had the capability to do.

So why don't you guys talk a little bit about how Palisades went and what we expect to be able to perform in the future, how we expect to be able to perform?

MS. BURGESS: With any event, preliminary information is just that, preliminary, and it seems to change minute by minute. So with the best information that we get, based on a senior resident at the site giving us, we were able to probably within an hour or an hour and a half give a rough big picture estimate of the situation of the event, conditional core damage probability.

DR. POWERS: I just have to interject an anecdote. In the hours following the Chernobyl accident, they called Moscow to explain they had an accident and the guy on site says, well, they've had accident here, but things don't look too bad.

That shows you how good preliminary information can be.

MR. DAPAS: Pretty gross estimate.

DR. SIEBER: It's all relative.

MR. GROBE: But our residents have a little bit more flexibility to speak what's on their mind.

MS. BURGESS: So we're able to give -- we have limited tools with the SAPHIRE model and the GEM model and obviously our model is not as extensive as the licensee is being able to model certain components and that, but I think we are able to provide a rough estimate, for event response purposes, of whether we need to send a special inspection or an EIT or an IIT.

I think in a lot of cases, definitely IIT is going to be self-revealing anyway.

DR. POWERS: You're saying that you've got enough information that you can provide information to management to make these kinds of decisions.

MR. DAPAS: Right. Do we need a special inspection? Are we comfortable that we have the big deal threshold or do we have time to acquire additional information and then maybe we need to send another inspector from another site versus --

DR. POWERS: When you decide, you make a decision and say I'm going to send a special inspection team to get to the bottom of this. You give that team a charter.

MR. DAPAS: Correct.

DR. POWERS: And you have enough information to give a charter.

MR. GROBE: The charter is developed within the first couple hours.

DR. POWERS: But when they do their best, they've had their week or maybe a weekend, they never occur at good times, right? You've had -- and they've brought forth what they need. Can you write what you would say is a good risk-informed charter from one of these AITs or IITs?

MS. BURGESS: I believe we can. Just in the past, before the probabilistic risk insight was used, we also used deterministic risk insights. And our charters were very right on the money when we sent out a team and I don't see any difference now that the probabilistic risk insight is added.

I think we can do a very capable job of giving a real good charter to the team.

MR. DAPAS: But I think we would focus on things like is the licensee evaluating the risk significance, is the licensee trying to determine extended condition, is the licensee conducting a root cause, and, if not, we would challenge the licensee. And, again, that assumes that there is clearly risk significance associated with this that prompted us to send the special inspection.

MR. SINGH: I want to ask a question. SRA is a part of the AIT team most of the time?

MS. BURGESS: Not necessarily. It's dependent.

MR. GROBE: The last time we went an SRA out was the tornado that hit Davis-Besse. That was a year and a half ago or so.

MR. PARKER: The flexibility is in the program that if they think that there is a potential that there is some uncertainty or some concerns that we have, that they can --

MR. SINGH: How about, say, if you have an inspection team inspection, do you have an SRA as part of the team?

MR. GROBE: We certainly have that flexibility. But generally, usually, a special team is our lowest level of response. Generally, that's very targeted on equipment problems, root cause, things like that.

MR. CALDWELL: But I guess the answer, we haven't had a special inspection in this new process yet. So we're telling you what we think.

MR. SINGH: Because the reason I ask, I asked the question to Region IV when they had a fire at Diablo Canyon last month, and they had a special inspection and they sent the SRA up there.

MR. GROBE: That was a significant, complicated event.

DR. POWERS: One of the things the committee has to do is advise the Commission on where it should be spending its research resources and we're wondering if they are under-investing in developing these tools to be used by the SRAs.

MR. GROBE: We're clearly resource constrained right now. Almost all of our agency resources are going towards the SDPs and as they pointed out, the shutdown model, low power model, containment model --

MR. DAPAS: Risk-informed PIs is another initiative that Research has embarked on.

MR. GROBE: The interesting, I get anecdotal feedback, but I understand that the industry is not interested in risk-informed PIs. That the amount of money that it would take to implement it doesn't give them sufficient payback.

DR. POWERS: What had been proposed up till now, I agree with industry on that.

DR. APOSTOLAKIS: But if we couple this with the maintenance rule, will it be much easier to define those PIs? They already did a lot of it for the maintenance rule. So there seems to be a distance or gap between the maintenance rule and risk-informed regulations and using the PIs. I don't understand why. I mean, what I don't understand is why didn't the staff at headquarters say, when they were establishing the oversight process, that the PIs were plant-specific and the licensees should propose the thresholds.

They did it with the maintenance rule.

MR. DAPAS: I think the licensee, in many regards, has weighed in on the thresholds here.

DR. APOSTOLAKIS: But they have their own.

MR. GROBE: Not plant-specific.

DR. APOSTOLAKIS: They have their own.

MR. DAPAS: There was a strong emphasis with the PIs to minimize the dollar cost of implementation. So they depended very heavily on indicators.

DR. APOSTOLAKIS: Now they'll pay the price for the severe criticism that everything that is expected to be green and they don't mean anything and this and that, and it seems to me that there was an easier way of approaching it.

DR. WALLIS: Dana was asking about tools and I think you gave an answer about resources. Tools, to me, enable you to do more with fewer resources.

MR. GROBE: That's what I was talking about; that is, the resources are currently focused on other tool development and our ability to develop all these tools is resource constrained.

MR. DAPAS: From a regional perspective, I would offer we are certainly interested in any tools research can provide us.

DR. WALLIS: It may be we could get some resources, or someone, to RES to develop things for you, that's a different kind of resource.

MR. DAPAS: As long as they don't come from the region.

DR. WALLIS: Yes.

DR. POWERS: That's another question. Unfortunately, the ACRS has no role to play in that. That's an NRC management function. But it's one we certainly worry about, because it doesn't do any good to pay Peter by taking from Paul.

DR. SIEBER: Well, I think there is one other point, and that is that recently in the development of a lot of the criteria involved with license renewal, there was a notable contribution made by some people from one of the regions in helping to put together part of that approach. A lot of us, at least I personally am convinced that the Commission would do itself a great favor if it would make greater use of the talent that exists within the regions and, in particular, those people who are the senior inspectors, who have real knowledge of how the plants work, when they put together some of these proposals and ideas.

And so to that extent, we may be doing you the disfavor of suggesting that you be a greater participant, but I hopefully would believe that that's, in the long run, a productive thing rather than counter-productive. I mean, we have to be frank with you on that.

MR. GROBE: We're one agency, though, and what's best for the overall safety of the industry is where our focus is.

DR. SIEBER: Yes.

DR. POWERS: My boss used to say that he was giving you an opportunity to exercise your management talent.

MR. CALDWELL: I think you're exactly right that there are resources in the regions that would help out a lot of the development of new programs, et cetera, but there needs to be a shift in resources, because typically the development is in headquarters.

So in order for that to work effectively, then we need to shift some resources to the regions so that the regions have that flexibility to interact or get involved in the development activities. Because right now, it's the program office that does all the development and they resources for that. But we wouldn't disagree that we think the talent we have in the regions could help that process. It's just that we are base-loaded right now.

DR. SIEBER: Every time we've had a blood drive in this organization, the people who have contributed have been research and the regions. You don't understand.

MR. CALDWELL: I understand. I have to say, though, that the program offices have taken some pretty significant cuts and tried to prevent those cuts from the region. So we have fared reasonably well in the past; in fact, most recently.

My point is that if we're going to use regional resources for developmental programs, then you have to recognize that in the budget.

DR. SIEBER: I agree.

MR. CALDWELL: And take some of the developmental resources from the program office and put them in the regions. We are perfectly happy to do that and be involved. It's just that we have to be careful that we have enough folks.

DR. WALLIS: You can be very involved in defining what are the problems, what could be the solutions, what would help you. You're the customer for something. I don't see you being quite so involved as a resource in developing something, but very involved in being articulate and somehow expressing what it is you need, what the characteristics have to be of something which comes out of some research activity.

MR. CALDWELL: A lot of the details of this new program, though, were developed by regional resources.

MR. GROBE: That's right. That happened under the old program, so we had some flexibility and we sent a lot of folks into headquarters.

MR. DAPAS: Task groups, et cetera.

CHAIRMAN BARTON: Since lunch seems to be out the door, we'll break for lunch from now until 1:15.

[Whereupon, the meeting was recessed, to reconvene this same day at 1:15 p.m.]

AFTERNOON SESSION

[1:15 p.m.]

CHAIRMAN BARTON: We've got till 3:00. We don't want to miss anything that you want to tell us you feel is important, but try to get wrapped up by 3:00.

MR. GROBE: Well, why don't I fly through the training analysis, then.

CHAIRMAN BARTON: Okay.

MR. GROBE: I mentioned earlier that in the area of engineering inspections, that we've had to evolve our expertise and that's because we're doing more design inspections and we can no longer rely on contract resources.

CHAIRMAN BARTON: Right.

MR. GROBE: In addition, we've got a fairly high turnover rate. A number of our individuals have left the jobs with utilities, as well as we had a number of retirements.

So we've been in a fairly strong recruiting mode and we've been trying to emphasis recruiting of individuals with a stronger design expertise.

That's different than the expertise we've had in the past in the region. We've had some design expertise, but not a lot.

CHAIRMAN BARTON: Are those people hard to find now?

MR. GROBE: Absolutely. Absolutely. And we had some folks go out to the east coast out of Region I to try to find out if there was anybody interested in joining up.

But basically it's the engineering firms, utilities and military that are our recruiting pool.

The safety system design inspection is five engineers for three weeks and, again, if we're going to be successful in those inspections, they have to be qualified with design experience, mechanical, electrical and I&C system engineers.

The Appendix R inspection, the fire protection inspection is three multi-disciplined engineers, and, again, they have to have very unique experience. They have to be experienced in Appendix R inspection capability, and we're going to talk a little bit about the kind of training that they --

CHAIRMAN BARTON: Are they ongoing or is that a one-shot deal?

MR. GROBE: We had inspections early, following publishing the rule, through the '80s, that were, at that time, intended to be one-shot inspections. Since then, the inspections were suspended. Now, under the new program, we've re-initiated some inspections.

For a while, we were doing inspections out of -- that had the acronym FPFI, fire protection functional inspections, those were done out of headquarters and they were not programmatic in nature in the sense that they were mandated to be done at every plant.

But this is not an FPFI. It's not at that level of detail. But it does touch on the same elements that a fire protection functional inspection touched on.

You need somebody with fire protection engineering capability. We don't have a fire protection engineer, but we've trained one of our engineers to assess those kinds of attributes of the licensees' design.

We also need an I&C or an electrical engineer, but it's unique expertise in evaluating Appendix R types of I&C issues. And then you need a system operations engineer to look at how the licensee would implement procedures post-fire and whether their plans are feasible.

DR. POWERS: Do you have plans to do induced station blackouts?

MR. GARDNER: Yes. I'm not saying Region III has, but there are some in the country, that because of the fear of not being able to contain spurious operations, they go into a station blackout condition, and that's a concern, obviously.

MR. CALDWELL: We don't have them.

MR. GARDNER: Not that I'm aware of in Region III, that's what I said. I'm not sure there are any in Region

III. We'll find out.

MR. GROBE: We should introduce Ron. This is Ron Gardner. Ron is my electrical engineering branch chief. We do our fire protection inspections out of the electrical engineering branch.

DR. POWERS: The induced station blackout is a problem, it's a recovery.

MR. GARDNER: Well, it puts you into a condition that you don't want to get into.

MR. GROBE: Just to touch briefly on what we've been able to accomplish to date, we hired a Ph.D. I&C engineer who had 12 years of experience designing control systems for fighter jets, digital control systems for fighter jets. We're trying to turn him into a nuclear power plant I&C inspector.

We hired, he's on yet on board, but he's accepted our offer, an I&C engineer who was one of the co-chair of the Appendix R BWR owner's group. So extensive Appendix R experience.

We hired an electrical engineer that had extensive experience in the industry, as well as prior inspection experience, and we just brought in a mechanical engineer, he's a former senior resident inspector, into the mechanical engineering branch.

The area that we're having trouble is mechanical design, piping stress analysis, that sort of thing. We're still looking for that resource and we're still looking for another electrical engineer. But we've had some success in this area. They are hard to come by.

I want to talk a little bit about training. Ron?

MR. GARDNER: In the 1980s, when we did the 64-100, I don't know if you remember that number, baseline inspections, that were actually to make sure licensees were meeting their required date for implementing 50.48 and Appendix R, we had degreed fire protection engineers in just about every region and we augmented our people with NRR resources and contractors.

We had a very good team. Unfortunately, since the 1980s, we've lost those fire protection engineers. We lost one to NRR, one went to actually OI. And then the FPFIs came back, and I can talk about how we got to where -- some of that's with Generic Letter 92-18, you might be aware. So you know how we've gotten there.

In any case, unfortunately, today, with the baseline program introducing the FPI, we don't have degreed fire protection engineers. We have inspectors that were doing the base fire protection inspection and that is a far degree of difference between that and design of fire protection systems.

As Jack indicated, we have started training a fire protection engineer. We had a training session that NRR put on, two sessions each a week in Brookhaven, you may have heard of that. We're having a follow-up training session in the region here in September, one day, unfortunately.

For the first couple of inspections, we're having a contractor assist. We're doing an inspection right today, the last day of the inspection is Friday, at Braidwood, fire protection inspection.

We have two Brookhaven contractors. That's OJT that we're getting from them. We have NRR technical expert also on that team that's also giving them some training.

So through a combination of OJT and classroom training, we are attempting to reach a level that we feel comfortable with as far as the technical capability of our people in this area.

As you know, it's very complex, though.

MR. GROBE: For a period of six months, we've gotten limited contractor resources in the fire protection area, and for about 18 months in the design area, to put one contractor on each inspection team. And the goal of that is to develop some on-the-job training.

In addition, we're doing some internal course work on heat sink, thermal hydraulics, somebody mentioned heat transfer earlier, because we have a new inspection we hadn't done before, it's called heat sink. What it primarily focuses on is the viability of heat exchangers. And we're exploring the TTC in other regions, discipline-specific course work in heat transfer, set-point methodology, instrument loop uncertainties. We hadn't focused a lot in the past in these areas, so we're looking at developing some internal course work in those areas.

CHAIRMAN BARTON: TTC?

MR. GROBE: TTC is the technical training center, currently in Chattanooga. I would expect most of this is stuff we're going to do.

MR. SINGH: I have a question. Before you suspended the inspections back in the '80s, did you ever do the triennial inspections in fire protection?

MR. GROBE: No. We didn't do one in this region.

MR. SINGH: You did not.

MR. GROBE: No. There were, I think, only three done in the entire country.

MR. SINGH: No. There were lots of them. I did all of them in Region IV.

MR. GROBE: Oh, did you?

MR. SINGH: Yes.

CHAIRMAN BARTON: How many did you do in Region IV?

MR. SINGH: Eight. So nothing was done. Thank you.

MR. GROBE: Any other questions in engineering?

MR. DAPAS: I just wanted to touch upon, starting with slide 42, some of the staffing challenges in the resident inspector program. We've experienced a relatively high turnover rate and consequent with that is the challenge to fill vacancies.

You have to post the vacancy, go through the selection process, and then train the individual, and with the qualification process, it can be several months before we have a fully engaged resident inspector replacement once we've identified the vacancy.

CHAIRMAN BARTON: The primary reason for the high turnover rate or does it vary?

MR. DAPAS: It varies. It can be promotional opportunity for the resident inspector that may go on to be a senior resident inspector or come into the regional office. It can be -- and that goes for both resident and inspector and senior resident inspector.

It's a bit more limited for the senior resident inspector in terms of promotional opportunities, but there have been a number of residents that have received promotions, or requests for lateral transfers. We had a resident inspector that wanted to go back to NRR to be a project manager and we supported that. He, of course, had family in that area and that seemed to be a win-win.

And in addition to that, there's attractive salary offers out there in the industry. Some of these plants that were in extended shutdowns, like Cook and others, plants that are merging, there's opportunities for experienced resident inspectors and you're dealing with signing bonuses, et cetera, and lucrative salary offers, that's been an attractive draw.

MR. CALDWELL: Was your question -- were you trying to get to whether there's dissatisfaction? I don't think we have -- I mean, there's always going to be some folks.

CHAIRMAN BARTON: But 12 percent is pretty high turnover.

MR. CALDWELL: I think most of the folks that left went for either geographic, promotion, or something that benefited them, either money or whatever. I don't think we lost anybody that just --

MR. DAPAS: Or early-out, I don't think so.

MR. CALDWELL: -- didn't like the program anymore.

MR. DAPAS: And that's one of the things we try and probe, was there some concern with or dissatisfaction with your working environment or et cetera.

DR. POWERS: But if the inspection program is going to turn them into automatons and eliminate discretionary and judgmental aspects of it, are you going to lose people?

MR. DAPAS: I'd challenge that characterization of the new program, but --

DR. POWERS: I put the worst spin on it I can here.

MR. DAPAS: I think we are asking the inspectors to bring judgment to bear and as I said, in the context of what revisions do we need to make to the program, I know that Jim and I have had a lot of discussions, we place a high value and premium on experienced individuals with mature judgment and we value that and we're going to consider that input.

And we -- divisional meetings or one-on-one discussions with the residents, we go out to the site, we're continuing to encourage them to flush issues up to branch chief management, so those can be considered and evaluated, and not get locked into this, well, the new program doesn't allow me to do X or Y.

CHAIRMAN BARTON: One of the concerns I have is they do an SDP and they get frustrated because in the past it was the findings of violation and now you do it and it's --

MR. GROBE: It's an issue that we're having to focus some management attention on, because we've completely perturbed all of the structures that the staff had to demonstrate their own --

CHAIRMAN BARTON: Exactly.

MR. GROBE: -- in terms of value. So we're building what is currently called a significant reactor finding. We're going to rename it, but we're doing more internal recognition of inspection issues that add value, but don't get to a white, yellow or red threshold, add value because they provide insight to the licensee or provide insight to us as far as inspection techniques or other issues that other plants can look at.

So we're trying to find ways to give the staff anchors for their value, but it is a challenge.

MS. NESTON: Does this 12 percent also include the rotation out of a particular plant because they've been there for so long?

MR. DAPAS: I'm not sure on that.

MR. CALDWELL: In the range, it could include someone who has rotated back to the region, because either their time was up or we've had individuals who didn't stay the full seven because they were grandfathered with the five. They came up to their five and decided they wanted to do something different and rotated either back to headquarters or here.

MS. NESTON: And they would be included in that 12 percent.

MR. CALDWELL: They would be included in that.

MR. GROBE: In honesty, we haven't had a lot of folks that have been -- that have moved because they've gotten to their time limit. That's the exception, not the rule.

MR. DAPAS: That's with the extension to the seven years. But I think, and I view this as a positive, I think we've had a number of instances where feedback we've provided to the program office, discussion that we've generated in the different forums to discuss the new program has resulted in some change, and we try and build upon that as positive examples for the inspection staff, where expressing their views has resulted in revisiting of a given approach.

So we are encouraging that across the board as we go into initial implementation. The pilot program, we had input from really two branches, and now we've got input from all the branches, and there is a learning curve that they go through. Some of the feedback we're able to address as a result of lessons learned from the pilot program and then there's also additional insights that are communicated that we discuss and forward to the program office.

So I view that as kind of healthy. There's a long training period, as I mentioned, for qualification. You have to attend the BWR, the PWR series, plant-specific system knowledge, on-the-job training, that's certainly a large aspect of the resident qualification program, and then the emergency preparedness responsibilities, understanding the licensee's emergency response plan, the NRC responsibilities.

And I caveat this, appropriately. Some PRA training that the residents receive so that they can understand the use of the SDP process and how risk impacts inspection activities, and then they go through a course, an oral qualification board, where we have various branch chiefs that sit and ask questions to test knowledge in the regulatory perspective.

CHAIRMAN BARTON: What happens if they fail the oral board? Do they get another shot?

MR. DAPAS: We have had a couple individuals, in my experience in the region, that we felt needed another qualification board. So there were particular areas where they had to concentrate and devote some additional study and then they were successful in their second board. But the branch chiefs, I think, are fairly successful in not offering or sponsoring a resident for a qualification board until they're pretty confident that they've acquired the requisite knowledge to be successful.

So we've had limited experience where that has occurred.

MR. SINGH: Do you also have an oral board for the regional inspectors?

MR. GROBE: Absolutely. Every inspector goes through an oral board.

MR. DAPAS: And then when we looked at the pool of experienced resources, that's a bit limited. Obviously, we draw from the Navy or shipyard or licensee operational experience.

DR. POWERS: If the Navy keeps working its folks as hard as they are right now, you'll have a big pool of people.

MR. DAPAS: We get some applicants that have a lot of experience in the nuclear power program that the Naval Reactors runs and that's because they are downsizing. So they're looking for other opportunities.

But this does require an aggressive recruiting program, because as I said, the competitive salaries and the signing bonuses in the industry, the lengthy process we have to go through for selection, rating panels and interviews, et cetera. So that can sometimes -- where employee X can say here, we're offering you a job here.

Sometimes we've been in the process of going through the selection and we're ready to forward an offer and individual X has said, well, I just took an offer a couple weeks ago with company Y. So sometimes we're confronted with that and we look for ways to streamline that.

One of the things that we're also looking at is the entry level program, and that certainly is a resource investment, but we want people with experience. But, again, that can be limited, so we look and explore the entry level program.

MR. CALDWELL: Mark is going to try to hustle up here so we can get into the fire protection stuff, but I want to make sure, before he gets out of this, if you have any questions on this, because it is probably one of the most important programs we have; not necessarily because the other aspects, what we do is not important, it's because these are the folks that are on the site that are there all the time.

What they do is -- what I saw as the biggest change in the way the agency worked was that licensees now expect to have somebody there, so that they don't operate differently than they would if an NRC presence wasn't there.

I talked to some staff people and they told me that in the old days, when they knew the inspection team was coming out, they changed their mode of operation for that week and then changed back after they left.

So the resident program has provided a routine presence which keeps folks from operating differently when we're there.

CHAIRMAN BARTON: It keeps them honest.

MR. CALDWELL: Well, I didn't want to say it that way, but that's essentially it. I didn't mean to interrupt you, Marc.

DR. POWERS: Well, there's another thing that you have to bear in mind, that all of us have to bear in mind, that there is a very, very crucial role that they play and this SDP process is their process for screening their findings and whatnot. So their level of responsibility, to my mind, has actually gone up in this new procedure and some of these things I worry about are responsibility and judgment, notwithstanding I think there are still concerns.

MR. GROBE: The SDP is not limited. The residents obviously have a role in evaluating their findings, but the region-based inspectors also use that, that the value to the inspection program that the residents add is -- I can't remember the number -- but several hundred hours of their time is allocated to what we call plant status and that -- it's 650, and that's supposed to be a risk-informed assessment of what's going on, so that they can engage themselves in the right activities and also engage the region-based folks that come out in the right activities from the risk perspective.

MR. CALDWELL: I cut Marc off and I apologize.

MR. DAPAS: One of the things we talked earlier about is the impact of the training courses at the technical training center, when they're offered, but branch chief X has a vacancy and is successful in filling that, but the annual PWR course just completed, that individual has to wait till the next year to pick that up.

CHAIRMAN BARTON: So it's only given once a year.

MR. DAPAS: Right, and I guess that is a function of the demand that they have when you look across all the regions and all the offices, that they were only able to justify one course a year, but sometimes that does have an impact depending on when your individual reports on board.

And we already talked about absence from the site for an extended period. If you're attending a seven week course in Chattanooga, you're going through the qualification process, that impacts baseline program execution and site coverage and that requires pretty involved branch management of the inspection --

CHAIRMAN BARTON: You bring another inspector on board for that period of time, right?

MR. DAPAS: Right. We were looking at like a contingency plan. A good example is in an outage. The licensees are short during outages. There's I forget how many hours associated with the resident inspection portion of the outage. Do you recall, Laura?

MS. COLLINS: Eighty.

MR. DAPAS: Eighty hours. Doing that at what might be a 22-23 day period can be a real challenge if there's only one inspector on-site and branch chief X might ask the other branch chiefs can you help me out with sending someone during this outage period.

And as I mentioned, on-the-job training is a large part of the program. And the experienced SRIs look at resident inspector development as a high priority and their responsibility. It's kind of like I'm training my replacement coach. So they place a premium on that and I think we get a lot of value-added.

And the other thing, as I mentioned, we look at reduced training length when hiring high quality individuals who can hit the ground running. We have had some interim certifications in selected areas of the inspection program because an individual comes on board that has an extensive operations background.

And then the extensive cross-training. I was just looking yesterday at the number of residents and senior residents that have both PWR and BWR training, and so they're fungible to go to other sites without having to take the specific series course.

And the other aspect of this cross-pollinization is between DRS and DRP. We've had a resident inspector go to operator licensing and a senior resident that reported to operator licensing, as well as an individual from the engineering branch going out and being a senior resident.

So there is some cross-pollinization between divisions which we think is real beneficial.

If there are any questions.

CHAIRMAN BARTON: Do resident inspectors get overtime?

MR. GROBE: Yes.

CHAIRMAN BARTON: Are they paid overtime?

MR. GROBE: Absolutely. Let's move on to risk training. What I'd like to do -- do you folks have any questions about the SRA training program? Are you familiar with that?

CHAIRMAN BARTON: No, I'm not familiar with it. What slide are you on, Sonia?

MS. BURGESS: I'm on 46. There's Region III is no different from the other regions. There's two SRAs in each of the regions and there is consideration of an additional risk trained person and that can take the form of a couple of different options.

One is using existing inspectors with additional risk training, so they can do it part-time, and another person that's dedicated to assist the SRAs in the analysis of risk.

CHAIRMAN BARTON: Have you been in a position of trying to assess what your needs are?

MS. BURGESS: Yes.

CHAIRMAN BARTON: You need another warm body or do you need an assistant?

MS. BURGESS: We have. The SRAs have put their input in and what we would desire, what we think we would need. We definitely think we'd need at least one additional risk person.

CHAIRMAN BARTON: A lot of times people will have one slot and they say, well, what I'll hire is a new senior reactor analyst. Point in fact, they've got enough senior reactor analysts. They need an assistant for them to help them carry out their jobs, and I'm just wondering if you had thoughts on that.

MR. CALDWELL: There's no plans to have an additional SRA slot. As I mentioned earlier, there's a task force that, in fact, the meeting starts -- the first meeting is on the 26th, of the four regions and headquarters, to talk about SRA succession planning, and that really is to talk about the type of training that you would give one, two, three, four, five individuals, I'm not going to prejudge how it comes out, but a number of individuals who would not be fully SRAs, but would have additional training that they could support the SRAs and the region in risk assessments.

Not a short-term thing. I mean, the two SRAs are going to be just up their necks in work, but it's a recognition that there needs to be some more expertise in that area and a recognition that that you need to have somebody in the pipeline unless an SRA gets promoted or decides to leave.

DR. POWERS: They better not.

MS. BURGESS: That's a great segue into the next slides.

MR. GROBE: I was going to say there's a lot of personnel barriers associated with this, because the SRA position is a higher graded position than any other staff position we have in the region.

So there's a lot of issues that come up in the HR area.

MS. BURGESS: On slide 47 is the SRA training certification program or process is an 18 to 24-month program. It's divided into classroom and rotation and I've listed some of the technical training, the statistics, PRA training, and then the NRC PRA computer modeling training. That, in itself, can be up to 27 weeks of training.

CHAIRMAN BARTON: Where do they get the PRA training?

MS. BURGESS: In headquarters. And most of the time, much of the training is contracted out. Brookhaven, INEL. So just the classroom portion of the training is a significant amount of time.

Rotations, there's nine months of rotation. Mike and I did five months in NRR in the PRA branch, we did three months in the Research PRA branch, and then we did one month at another region to get on-the-job training, with the assistance of an existing SRA, to see what their job duties were and how they conducted business in the region, and took that back to our region.

MR. CALDWELL: And that's one of the areas that we're going to look at. Now that we have experienced SRAs in the region, we may not need these extensive rotational assignments. They'll just spend their time with the SRAs in the region to get their on-the-job training. But the classroom training that she was talking about is extensive.

It's not a short-term fix if somebody leaves or you need additional help. It's something that we're trying, for the long-term, and come up with a plan that will keep people in the pipeline and bring up the whole level of the region's expertise of risk.

DR. POWERS: It also offers the opportunity for substantial job satisfaction improvements there, the guy feels like he's going into modern technology.

MR. GROBE: I think we've covered slide 48. Why don't we go on to 49?

MS. BURGESS: Slide 49 just highlights some of the training that the regional inspector and the resident inspector would receive. This first bullet is a two-week class. It's a combination of the PRA basics plus we have how integrated the SDP process and now the PRA and the IPE all integrate into the SDP process. That's a two-week course.

An then also we've given extensive training on the SDP process itself. We've had a lot of workshops and with a lot of examples of issues from other regions and that's helped the inspectors put some practical use to the SDP.

MR. GROBE: Any questions in the risk training area? Before we get into the fire protection area, there were two questions that you asked earlier that we didn't really get a chance to answer, and I'll just give my perspective and open it up to Jim and Marc.

One had to do with power up rtes. We don't have a lot of insight on power up rate, other than the fact that I could share with you a concern that I have. Jim Dyer mentioned Quad and Dresden are going to be coming in for some fairly significant power up rates and you indicated Duane Arnold is, and that has to do with secondary side capability and the ability of the operators to operate the plant in a higher, significantly higher power level, and whether that's going to impact on initiating event frequency.

I don't have any more insight to share with you, other than that's a concern that we have, and I'd throw that open to Marc and Jim.

MR. DAPAS: The power up rate, I guess from the resident inspector perspective, I think you would get involved, the resident inspectors get involved in looking at if there's any tech spec ramifications. Many times, the tech spec package that comes out, headquarters is considering, the residents will be asked to review, to offer any perspective procedural implications.

So it's just really changes to the tech specs and procedures that result from the power up rate. I can't really envision any other area where the residents might be engaged.

CHAIRMAN BARTON: With a number like that, you're going to have to make some hardware system changes when you go in that level.

MR. CALDWELL: Right. Set point changes that have to be made and they have to be made as they go up.

MR. DAPAS: Which are captured in the tech specs.

CHAIRMAN BARTON: Yes, but they actually have to make changes in the plants. You have to -- because the trip set point stays the same, but the 100 percent power, as it's calculated, changed, and so the trip set points have to be changed in the instrument and control.

But what Jack mentioned is something that I don't know that we have any insights into, but some licensees find that they get the up rate and they just don't have the capacity we have any insights into they tripped their auto valves or their turbines aren't set up, at least the way things are set up, to handle that type of --

CHAIRMAN BARTON: Fermi is a good example of that.

MR. CALDWELL: Right. So those are things that they have to kind of inch up to and that's what we will be watching, how they do that, how they control it, and most licensees, at least today, had done it very slowly and very deliberate.

DR. SIEBER: These major up rates, though, they're really talking about a new front end on the turbine and the things like that.

MR. CALDWELL: Yes.

DR. SIEBER: Which really changes the physical plant.

MR. DAPAS: But I'm not aware of any prescribed inspection activity where we would go out and verify that what the licensee communicated in their licensing submittal is, in fact, the case in terms of equipment modifications.

MR. GROBE: It would be an opportunity through the affirmative plant mods inspection and the safety system design inspection to target some of those areas.

DR. SIEBER: But you know that the stress level on the plant is going to be higher.

The other you raised earlier was license renewals and we haven't had any in Region III, but we've seen that train coming down the tracks, and we assigned a project manager to stay aware of what's going on in the other regions and headquarters.

The inspection program for that activity is fairly significant and while it doesn't have any direct impact on the baseline program, it doesn't change anything we do in the context of baseline.

It's resource intensive and as we shared with you earlier, we don't have a lot of resources.

It's also a fairly unique expertise that's necessary. There is discussion underway right now, and maybe, Ron, you can expand on this, too, to capture that inspection activity out of headquarters or currently it's out of the regions.

Why don't you talk about what we've done as far as trying to gain insights in this area?

MR. GARDNER: As Jack indicated, we have a principal inspector that we've assigned to get with the other regions who have started down that path, to find out what they've done, how they did it, what worked, what didn't, to try to get to the point where when we get our opportunity, we're not starting at ground zero, that we've already built on what other people have done and tried to make improvements.

AS Jack indicated there is some discussion about who will do what. There's a big portion, as you might imagine, of environmental qualification questions that come into life extensions of license renewal.

And I have been part of one of the research working groups, for years I was on that, on aging of materials and such. So I have an acute background in that also.

So I think we have the wherewithal to do the inspections, the challenge will be finding the resources to do it.

MR. GROBE: What's the total number of inspection hours we've seen?

MR. GARDNER: I can't remember.

MR. GROBE: My recollection is on the order of 700 and something.

MR. GARDNER: I thought it was 800, roughly 800.

MR. GROBE: It's a very significant impact, because it has to be done a very short period of time.

DR. POWERS: We have a statutory responsibility for all those and we're looking at a major tidal wave coming in at us and it could literally consume everything we do.

MR. GROBE: I think that captured all the questions that I had written down earlier. I think what I'd like to do now is go into the fire protection issues and turn it over to Ron Gardner. I know that you're going to have some questions. I suspect you're going to have some questions.

MR. GARDNER: As Jack indicated, my name is Ron Gardner. I'm the Chief of the Electrical Engineering branch in DRS and fire protection falls in my branch.

What I've tried to do is make a presentation that would address where the new program is going with fire protection, not only triennial, but also the more day-to-day review of fire protection and the normal fire protection things that the regions have been doing over the years.

We didn't stop that. We're just doing it in a different manner.

The first thing, I guess, on slide 55 that I want to emphasis is the risk contribution of a fire. It is significant and if you stop and think, with the fire, you can have a plant transient, you could have a reactor trip, you could have a loss of off-site power, you can -- we talked about self-induced station blackout.

All those require fairly significant reactor operator actions. You can go beyond that, though, with the high-low pressure interface problem or a stuck-open PORV, a spurious operation of an SRV, and you enter a LOCA condition.

Compound that with a loss of off-site power and you've got very numerous operator actions. Then with a fire, you may have smoke, which could inhibit or prevent operator actions. You have flooding, you have the heat of the fire.

The fire itself is a very significant area of NRC historical perspective and it looks like it's going to continue, that we're going to maintain our focus on this.

There were a number of years where we backed off. Information Notice 92-18 and the subsequent problems we had with the implementation of that, that was regarding motor-operated valves and the potential for spurious operation and control room fires, to have the valves not only go to the wrong position, but to be destroyed mechanically because of the bypassing of the torque switches.

Also, we had some FPFIs that failed, with significant findings.

So going on to page 56, I wish there was a silver bullet where we could say here is the fix, that we could say the risk of fires has gone away by just doing this one thing.

No one has been able to find that silver bullet. So that instead, what we find is the best approach and licensees have found the best approach is the definition methodology or mentality. It starts off by preventing fires, and I'll talk more about that when we talk about what the resident does and how we try to gauge how licensees are doing in preventing fires.

Then we have the part of rapidly detecting, controlling and putting a fire out. Great success, if you remember the Fermi turbine explosion, it released thousands and thousands of gallons of oil, EHC fluid, et cetera, and distributed it all over the plants, with all the water systems that were ruptured, and the fire was extinguished and rapidly extinguished, and that could have been a very, very significant fire and it didn't happen.

So that says that in that case, the rapid detection, control and extinguishment of the fire worked, and that involved obviously even the hydrogen system for the generator.

DR. SIEBER: One of the problems is, though, that when you have a big fire in the plant that involves operations, it's the operators who are the fire brigade.

MR. GARDNER: Often, and I'll about it. They have a lot of manual actions, too, sometimes to mitigate the fire. One of the things that the licensees are required to do is for any fire area, is to dedicate or to preserve enough equipment to safely bring the plant to cold shutdown, and the performance goals they're trying to make is reactivity control.

They want to make sure the plant is no longer critical. They want to have makeup. They want to have decay heat removal. They want to have enough indication for the operators to know which manual actions to take or which actions and EOPs to follow. And a support system.

So that's quite a lot that you have to maintain regardless of whatever fire you can postulate. To do that, you have barriers, suppression, safe shutdown procedures, and you have a number of equipment and systems that are dedicated just for those operations that have to survive in the event of a fire in any given postulated fire area.

Unfortunately, there are no performance indicators existing today, and this is slide 57, to provide insights or to help us to say that we don't need to do an actual inspection.

And we haven't given credit for self-assessments. One of the reasons, and I'm not saying a significant reason, but one of the reasons was when we were doing the FPFIs, Prairie Island did a self-assessment. When we did the FPFI, we gave them credit for it. So our FPFI was focused on determining the adequacy of their self-assessment.

When we went out there and looked around the plant, we found a number of issues that their self-assessment had missed, and they weren't small issues. I don't have -- if you look at the inspection report, you could see them.

They were fairly substantive issues, and we were surprised. I'm not sure if that had a major contribution to the fact that the NRC wants to at least start down the road of doing our own inspections, but it probably didn't help the licensee's cause any, because I know NEI was looking to see if they could have more credit for self-assessments.

MR. DAPAS: Didn't we also, though, Ron, have some have some real significant inspection findings in that area and that has furthered the point that we should independently verify.

MR. GARDNER: Right. Now, a number of licensees are doing self-assessments and they are finding significant issues, and that's to their credit. It's just whether or not we are comfortable with saying they are to the point now where they can find the amount of problems that we think are there still, and that's an unfortunate statement, but that's true, unfortunately.

Now, as I was indicating, it's not just a triennial or design inspection. We have a constant focus on fire protection that's brought about by the residents.

On a quarterly basis, residents tour six to 12 areas of the plant, and they're looking at the classical fire protection features. They're making sure that the licensee doesn't have extensive combustibles or ignition sources for those combustibles in the plant.

The licensee has requirements for storage of combustibles, et cetera, they're looking at that. They're making sure that the material condition of the fire protection systems is up to par, that they're not degrading. Operational lineup, say, for a C02 or a halon system, they're making sure it's properly lined up, so if there is an automatic initiation, it would function.

They look at operational effectiveness of the equipment and of the licensee's fire brigade and fire barriers.

CHAIRMAN BARTON: Are those quarterly inspections what you require to be done during an outage?

MR. GARDNER: Required to be done during an outage.

CHAIRMAN BARTON: Yes.

MR. GARDNER: I'm not sure that the procedures differentiates between an outage and a non-outage condition.

CHAIRMAN BARTON: The only reason I bring it up, because in outage, you've got an opportunity to bring in a lot more fire loading combustibles.

MR. GARDNER: That's why the residents are out doing this, because they're there during the outages and not. Usually, the region stays away from an engineering type inspection during an outage, the residents are there anyway.

MR. SINGH: This question came up last week when we were got in the NEI conference on fire protection. They don't want it during the outage, because there's too many combustibles, too many --

MR. GROBE: They don't want us to do an inspection?

CHAIRMAN BARTON: Yes, that's why.

MR. SINGH: They emphasized the point that they do not want the NRC doing inspections in the outage.

DR. APOSTOLAKIS: Do you have any IPEEEs yet?

MR. GARDNER: Any I what?

DR. APOSTOLAKIS: IPEEEs.

MR. GARDNER: We have the Generic Letter 88-20, Supplement 4, IPEEEs that the licensees have been providing.

DR. APOSTOLAKIS: So you have their IPEEEs.

MR. GARDNER: Yes, we do. If you recall, in fact, several years ago, Quad Cities released their 5E-to-the-minus three that really stirred up the region to take action on that.

DR. APOSTOLAKIS: I wonder whether you can prioritize these fire areas that you're inspecting according to their --

MR. GARDNER: And I'll get into that in a minute, if I could, because that's one of the things we do as part of our triennial and it's also done by the resident inspectors when they are looking in their areas.

MR. GROBE: Step back for just a second. That's one of the reasons that we have to spend more time preparing for these inspections, because everything we do has to be risk-focused. So something as simple as selecting which plant fire areas to look at would involve some consideration of the risk significance of fire areas.

DR. APOSTOLAKIS: That's a one-time job, though. After you've done it, you have it for that time, correct? Unless something dramatic changes.

MR. GROBE: That's correct.

DR. APOSTOLAKIS: So it's an initial investment in a new process.

MR. GARDNER: No. What we find, and I'll go into that. It's changing. It's not a static. It's a dynamic number --

DR. APOSTOLAKIS: But the critical locations, unless you really change the plant, it's where the cages come together.

MR. GARDNER: Evidently there's other things. We have found that it's changing, and I'm going to that in a minute.

DR. APOSTOLAKIS: Okay.

DR. POWERS: There's a little problem in using the IPEEEs as the basis for prioritization.

MR. GARDNER: Right.

DR. POWERS: Because there are some crucial assumptions that some licensees have made in screening things out, I mean, things that just don't appear in the IPE have gotten screened out because though there's a high combustible loading, you can say, well, there's no ignition source. I can screen this area out.

Well, that's all well and good. What happens when an ignition source gets introduced?

MR. GARDNER: And I hope to get to that point, too. That's one of the subtle aspects of the new program versus the old, in that when we postulate a fire that can affect safe shutdown equipment, we have to be able to demonstrate how the combustibles, whether they be cables, scaffolding, whatever, how it can ignite, what is the ignition source, and then how you can get the fire to migrate from one part of the fire area to another.

In the past, we used to assume it just happened. We just say you have to assume it happens. Now we have to develop a scenario to show reasonably that it will, in fact, because of the heat plume and of the effects of that plume, it will transverse the fire area.

So if I don't get into that further, if you need more when I go through it, let me know.

DR. POWERS: There are other subtleties in there, as well, because a lot of the IPEs have been done saying, well, the fire barrier penetration seals are 100 percent guaranteed absolutely effective. And I don't know of anything that's that guaranteed.

It's just one of these problems. You just can't look at an IPEEE and say, well, this is truth, it's truth if one person saw it.

MR. DAPAS: Ron, do the inspectors look at the IPE to understand the assumptions before they go out?

MR. GARDNER: Yes, and that's what I'm going to get into in just a couple slides.

On page 59, if we can go to that one, we shift from what the residents are doing on a monthly and a quarterly basis to an annual inspection.

It's always important to understand how the licensees fire brigade can perform. It may come down that they are the last of the defense-in-depth for a given fire area. So we hold them to a high standard.

DR. POWERS: We usually just assume that

defense-in-depth. In the good old deterministic days of Appendix R, we just assumed that fires aren't out until the fire brigade goes in to put it out.

MR. GARDNER: That may be true. I don't recall that.

DR. POWERS: Automatic suppression systems were assumed only to control fire and to actually put it out, you had to have somebody walk in there and put it out.

MR. GARDNER: At 3G, it gives credit for separation and if you don't have separation, for suppression and detection.

DR. POWERS: It's just suppression. It's not putting it out. The fire's not over until somebody actually goes in there and declares it out.

MR. GARDNER: From a design approach, it gives credit for suppression.

DR. POWERS: Under the new program, we weigh suppression. We have a fire mitigation frequency, I don't know if you're familiar with the new SDF, significance determination process for fire protection, and there is a formula for SMF which includes fire barriers, ignition frequency, and automatic suppression, manual suppression, and CC, which is common cause.

So that is figured in to the equation. Again, on the resident inspection portion, on an annual basis, they check certain aspects of the fire brigade. What they would probably do is not ask for the fire brigade, but find one that is routinely scheduled and observe it.

The triennial inspections do not demand that a licensee do a fire brigade just for the triennial. We would get information from the residents about whether their perception of the fire brigade's adequacy was, as well reading what licensees are finding and documenting their own critiques of their fire brigade drills.

Now, on page 60, I shift to the triennial team inspection. This is not a classical fire protection, looking for combustibles. It is more focused on design.

And in the preparation aspect, we talk or communicate, get with the SRAs, the regional SRAs; if they are tied up, we get with headquarters SRAs, and we get the risk rankings for different fire areas, and we have found that the IPEEE can give you some numbers.

We go out to the site and we find that those numbers may have changed. That just happened at Braidwood. The numbers changed. I don't have all the reasons as to why it happened, I just know that it did happen.

We also look at the transient sequences. All of this is done in conjunction with the SRAs to assist us in saying which of these fire areas would probably be the best for our inspection to focus on.

One of the things we may stay away from, by the way, is the control room. The control room is so analyzed and has so many people in it that some of the other rooms, sometimes we think would be more bang for the buck, so to speak, to look at than the control room, which a licensee automatically assumes they're going to evacuate anyway.

But that is a case by case basis, we'd have to look again and look at the rankings.

We have a very important two to three day full team information gathering visit. That's where the full team goes to the plant. They walk down the fire protection systems, safe shutdown systems. They look at the P&IDs. They determine what might go wrong. They say that the licensee is relying on HPSI for makeup and they may look and say, okay, let's see if we can find a valve that, if it were to close, would isolate HPSI from the water supply it needs.

And then they would check that cable or that valve to see if it's been protected or not. They would look at spurious operations, et cetera.

So that first two or three days is a very important aspect of our inspection. Obviously, we look at risk rankings, we look at things like that.

Then we come back into the region for a week, the whole team does, take that information that they gleaned from that two to three day bag trip, we call it, and determine their inspection plan.

They've finalized the areas they're going to inspect. They determine some cables, some areas of question they're going to focus on, and they get just about ready to go out there and start the inspection as if they had a very limited time, which they do, by the way.

CHAIRMAN BARTON: Wouldn't an inspector go look in the corrective action system to see how many outstanding items there are against fire protection system, deficiencies that haven't been corrected or are backlogged?

MR. GARDNER: We don't go into the licensee's corrective action program in detail. We have a small percentage of our inspection that looks at that.

What we try not to do is mind the licensee's corrective action program. We try to do an independent assessment of the licensee's fire protection program.

DR. APOSTOLAKIS: On 60, it says that you select three to five plant areas important risk for inspection.

MR. GARDNER: Right.

DR. APOSTOLAKIS: Then on 58, you said that you are inspecting six to 12 fire areas on a quarterly basis.

MR. GARDNER: On page 58, I was talking about the resident inspections. That's covered on a monthly or quarterly basis.

MR. GROBE: And that's just looking at classical fire protection, combustibles, controlled ignition sources.

DR. APOSTOLAKIS: But the question is why can't these six to 12 plant fire areas be ranked according to risk so you focus on the risk significant areas?

MR. GARDNER: We do under the triennial design inspection. We pick the most risk significant --

MR. GROBE: Laura, did you guys, when you did this module, did you use IPEEE insights to focus risk?

MS. COLLINS: We did.

CHAIRMAN BARTON: So even the six to 12 areas are among the --

MR. GARDNER: Yes, sir. They are also risk-based or risk-informed. Excuse me.

DR. APOSTOLAKIS: The areas are risk-based. They come from the PRA.

MR. DAPAS: The inspections risk-inform, though, when they're selected in the areas.

DR. APOSTOLAKIS: That's right.

MR. GARDNER: The triennial inspection shifts from the classical fire protection to a design focused inspection.

DR. APOSTOLAKIS: Are these areas, though, you take them from the licensee's risk assessment.

MR. GARDNER: We look at the IPEEE, we talk to the SRAs and we get the licensee's assessment of the relative risk.

DR. APOSTOLAKIS: So you may decide there are additional that require a tool, even though the licensee may have not found them to be a not very significant safety.

MR. GARDNER: That could happen. I'm not saying it's going to happen, but it could happen, certainly, if we found a basis for it. The resident inspector may have a reason for us to go to a particular fire area based on what they've been seeing.

DR. APOSTOLAKIS: See, that's where the standards w discussed earlier this morning become very important, because many licensees have used screening methodologies and unless you really look carefully at the assumptions that they have made, you may have missed important five areas.

The IFPI-805 is going to solve that, right? That's why ASME and ANS are not looking at fires. It's an IFPI that will do it. That means there's something fishy. You have to understand means this. Go ahead.

DR. POWERS: IFPI's expertise in fire risk assessment, just the personnel on the committee, it's just very, very limited. It's like one guy that really knows a lot about fire risk assessment. He may be the only guy in the country who a lot about fire risk assessment.

So to say that we will have a standard that means that you can look at a five analysis and have some confidence that you don't have to go plowing into the assumptions. I think that's overly optimistic.

DR. APOSTOLAKIS: So they should have given to the ANS then.

DR. POWERS: We haven't see any product from ANS at all.

DR. APOSTOLAKIS: Yes. They are more experienced fire analysts there.

When are we going to review this?

MR. SINGH: August 28.

DR. POWERS: That's when the committee meeting is.

DR. APOSTOLAKIS: Do I have it? You gave it to me.

MR. SINGH: Yes, so you do have it. I have a question. Did you have a chance to provide a comment on the NFP-805?

MR. GARDNER: I did. I believe I did. It was some time ago, I believe, and I think I remember --

MR. SINGH: Let me ask you another question. When I was at the conference last week, they discussed this NFP-805.

Did you realize that they have taken out the high pressure enthalpies from the core and also the -- it's really watered down.

DR. APOSTOLAKIS: The agency is going to endorse it for sure.

MR. GARDNER: Isn't it true that 805 will not be required to be endorsed? Is NFPA-805 going to be required to be endorsed or is it going to be --

MR. SINGH: It's not required, but they are forcing the NRC to look at it.

MR. GARDNER: But licensees will have an option as to whether they choose to enforcement.

DR. POWERS: And I suspect the number of licensees that will pick it up is going to be zip.

MR. GARDNER: That's my point.

DR. APOSTOLAKIS: I don't know about that. If it's nice and doesn't get into too much detail and it's a national standard, I think the licensees are going to push for it.

DR. POWERS: It makes Appendix R look like a cavalier off-the-cuff document. It's like doing Appendix R with a risk assessment.

DR. APOSTOLAKIS: That's tragic.

MR. GARDNER: Okay. Slide 61, the triennial team inspection has about 200 hours direct inspection and Region III is doing it in two weeks, other regions are doing it in a one week time period. And Region III is an outlier.

We think that two weeks gives us more time to develop our inspection questions and to have the licensee give us the answers in a more deliberate fashion, so that we feel like we've accomplished what we need to accomplish.

DR. POWERS: One of the issues that came up at the fire protection forum, and if you're not attending those, I would really encourage you to attend. They are great meetings that are put on by NEI, but they have lots and lots of information coming in about lots of things.

One of the questions they had, when you take this bag visit, people have been through this, said, gee, it works a lot better if the whole team comes for the bag visit, not just a few guys.

Is that what you're planning to do?

MR. GARDNER: Yes, sir. In fact, we had the first plat, which was Braidwood, they questioned us as to why we had more than a team leader coming. They thought that just the team leaders only should show up and for the reasons I spoke to earlier, it's of great benefit for the whole team to be there, and that's what we plan to do.

DR. POWERS: And I think that's the experience in industry. It makes life a lot easier for them, and actually NRC got some pretty high praise for the people running these things, saying that they had -- they get a letter that says assemble the entire universe of documentation on fire protection, that the team leaders have been very effective in whittling that down to what actually was needed and used. So NRC got some real strokes from the licensees on that, triennial inspections.

MR. GARDNER: Going on. We look at the fire area boundary design. Some plants have been forced, because of the vintage of the plant, to use huge areas. Quad Cities, originally, based on their design, used practically a whole turbine building as one fire area.

They and most licensees, through further review, are trying to narrow the scope of the fire areas to make it more user friendly, so to speak, for themselves and for the inspectors.

MR. DAPAS: That's because Quad Cities had to use bounding assumptions, because they didn't know the cable routing configuration.

MR. GARDNER: Yes, and also because unfortunately, when the first plants were built in the '60s, they didn't understand that it may be better to have more concrete walls than fewer, that those concrete walls could, in fact, be natural fire barriers. Brown's Ferry hadn't occurred yet, in other words.

Safe shutdown system selection adequacy. We see if the system they chose to have for makeup or for heat dissipation is functional during the fire or after the fire, et cetera.

System separation evaluation, we look at the 3G2 aspects. Any questions about those, I can enumerate on them. There's three basic ones.

When you're doing the inspection, you do a fire suppression -- slide 62 -- fire suppression.

DR. APOSTOLAKIS: What happened to 61? I have a question.

MR. GARDNER: Yes, sir.

DR. APOSTOLAKIS: The separation, as I recall from Appendix R, it says that trace carrying cables or redundant trains should be separated by at least 20 feet.

MR. GARDNER: There are three criteria, 20 feet is one,. No intervening combustibles, and automatic suppression and detection, if you use that method.

MR. GROBE: That's one exam criteria. Plus suppression and detection, plus no intervening combustibles. The 3G2A says --

DR. WALLIS: So this is 20 feet in the horizontal direction.

MS. BURGESS: Right.

MR. DAPAS: Right.

DR. APOSTOLAKIS: But in a PRA context, though, if they are 20 feet apart, that will, of course, inhibit spread of fire from one tray to the other, but there is a fire in the room and they're near the ceiling. Does it matter if it's 20 feet or 30?

MR. GROBE: That's why it requires -- the 20 feet is permitted, but only with suppression and detection. So you've got a sprinkler system to knock down the heat, you've detection to bring the operators in promptly or the fire brigade.

DR. APOSTOLAKIS: But these are all the defense-in-depth measures. But the separation criteria means nothing to identification, because you have a layer that tries --

MR. GROBE: It's somewhat of a compromise. There is a three-hour barrier or 20 feet horizontal with suppression and detection and no intervening combustibles.

The staff concluded that those were approximately equivalent in protective capability.

DR. APOSTOLAKIS: But if I have the suppression capability, then why do I need the 20 feet? Why is that important if I have --

MR. GROBE: Defense-in-depth. Probability of failure.

DR. SIEBER: If they're right up next to each other, suppression isn't going to help you.

DR. APOSTOLAKIS: I think they had in mind only propagation from one tray to the other. The fact that you will have a layer of gases that are hot.

MR. GARDNER: Well, if you have the 20 feet of separation, you don't have intervening combustibles, and you have detection and suppression, we don't affect that the fire will affect both redundant trains and we will give you credit and say you are successful, you have protected adequately.

DR. APOSTOLAKIS: If there is a fire somewhere else in the room generating hot gases, then both the trays will be --

MR. SINGH: No, George.

DR. APOSTOLAKIS: No?

MR. SINGH: If the fire is in the corner, you still meet the 20 feet criteria.

DR. APOSTOLAKIS: If I have the trays 20 feet apart, near the ceiling.

MR. SINGH: Right.

DR. APOSTOLAKIS: And there is a fire in the corner. Very quickly, if you have enough combustibles, you're going to have a hot gas layer there.

MR. DAPAS: You have a sprinkler system.

MR. SINGH: You have a sprinkler system and you have a detection system.

DR. APOSTOLAKIS: So then why isn't the sprinkler system relevant if the separation is only ten feet? See, we selectively use it when it's --

MR. DAPAS: We can only conjecture what was in the thought process. Some of us were around when that happened.

DR. APOSTOLAKIS: I think that you do not anticipate the hot gas layer from a third fire, that what they had in mind was spreading from one to the other, in which case all these measures make sense.

MR. DAPAS: We could only conjecture what was in their thought process.

DR. APOSTOLAKIS: There is one fire in the corner. You don't need a second fire. It is too hot. The reason I'm saying this is because the first time it was pointed out was after the first fire PRA was done and people said, yes, that is correct.

MR. GARDNER: Again, though, if you're going to use 20-foot, you can't have intervening combustibles. If you get into a diesel generator room, you're probably going to have to use a three-hour or a one-hour fire barrier.

So, you can't just blindly pick 20-foot. It depends on whether or not there's a chance that a fire that could occur as you were postulating in the middle. Then both drains go, but if that can happen, don't try to use the 20-foot. Use another one. Okay? That's where we'd be looking.

One of the things -- on the first slide -- the first point on slide 62 is the fire suppression damage assessment.

This is the part where, when we come into a fire area that we've picked and we do the what-if scenario, what could go wrong, in other words, how likely is it, and then what are the consequences of it, that's the basis of our inspection.

Licensees would have protected, let's say, through 20-foot separation, three-hour fire barrier, whatever. We don't find a problem with the barrier and we don't find a problem with the 20-foot, our rule indicates it's 21-foot, whatever.

We still don't stop, because what we find is that -- let's say, again, the licensee for a fire in that area is relying on a charging pump.

They have reliance on the BCT to be the initial source of water.

DR. WALLIS: How do you use this ruler when the conduits aren't parallel?

MR. GARDNER: We can take a average plane, a vertical plane, and walk that off. We can do it. We look at the valves from the DC-2 -- in fact, we've got this question at Braidwood.

The licensee had a cable for one of the valves on the BCT that ran through the fire zone and was unprotected, and it had been overlooked.

So, that's the kind of things we look at.

Sometimes the licensee has manual actions in a fire area, and they have -- in their procedure, the operator will come in and operate the valve manually.

At Braidwood, we found they were going into a room that was going to be 178 degrees. Our question was is this going to be a good idea?

They said water packs, and we said, well, it looks like he has to be there for cold shutdown. That's 72 hours. You know, most water packs will start boiling, if you're not too careful, after so many hours at 170-some degrees. It won't be boiling, but they'll be darn hot.

So, we have issues like that. That's the kind of thing we do through every fire area we pick, even when the barriers look pristine.

DR. POWERS: The step at which you have to assess the level of degradation of these is a step I've never understood very well.

MR. GARDNER: What level of degradation?

DR. POWERS: Okay. When you come in and you look at either manual fire capability or the fire suppression and detection capability, you have to make some sort of an assessment on the level of degradation -- high, medium, or low.

MR. GARDNER: Right.

DR. POWERS: And that's the step I've never understood.

What constitutes high and what constitutes low?

MR. GARDNER: It is somewhat subjective. I'm not sure it is completely objective.

Let's say you found the BCT valve and now you say I have a potential fire area degradation; I want to run it through a SDP screening.

Phase one, which would be just a cursory, is there a potential for any significance, you whip right through and say yes.

You go into a phase two and you have to calculate the fire mitigation frequency, which uses, then -- which requires you to have first an ignition frequency for whatever combustibles are in that room, it looks at the barriers, and if there is degradation of the barriers, starting with the fire barriers, you do a moderate or -- what's the term? -- highly degraded, I think, and those have numbers that adjust the risk.

That's somewhat subjective.

DR. POWERS: Yeah. I mean the numbers that are in there, that you actually plug into the formula -- I even actually found out where they came from, and they come out fine, but you have to make the subjective judgement on these things, what's the level of degradation here, and that was the step I never understood, and I have a set of notes from the BNL course to see if I could understand better just that exact issue.

MR. GARDNER: I went to the BNL course, and I don't think the notes will help you.

What will happen is this -- whatever method -- and we usually are fairly conservative -- you go to, you will come out with, let's say, a white issue. That doesn't end the process. That's when you start refining the level two evaluation. You'll get the SRAs. The licensee will get their own SRAs in there.

You will elaborate to the licensee what assumptions you used to come to a white conclusion. One of them would be that you're assuming significant or high-level degradation to the fire barrier or the manual suppression, whatever it may be that you're doing in that part of the calculation, and the licensee would obviously come back and say they think it's moderate, and the difference between moderate and significant can make you from a green to a white, as you know.

DR. APOSTOLAKIS: But shouldn't the ultimate criteria, though, be, really, the relative speed with which a fire is expected to spread, how quickly you can stop that. That really should be the ultimate criteria.

MR. GARDNER: That's a part of it. It's much more complicated than that.

DR. APOSTOLAKIS: Like what else?

MR. GARDNER: Well, ignition frequency -- okay. First of all, you have to postulate --

DR. APOSTOLAKIS: Oh, you mean when you deal with --

MR. GARDNER: -- the plume and that there is a potential for --

DR. APOSTOLAKIS: But suppression deals with a fire that's already there.

MR. GARDNER: Yes.

DR. APOSTOLAKIS: So, Dr. Powers asks how do you decide that degradation is significant. What I'm saying is the criterion really should be can you arrest the growth of the fire before it does damage.

DR. POWERS: That's not the way the thing is set up, George.

DR. APOSTOLAKIS: I know it's not, because it was not done using risk assessment.

DR. POWERS: Yeah, it was. It was done using your wonderful fire technique.

DR. APOSTOLAKIS: No. No. We very clearly have an equality there. The time to damage has to be less -- greater.

MR. GARDNER: I think if you're familiar with the fire protection SDP process, you can see that they have tried to make --

DR. APOSTOLAKIS: It's very hard to do.

MR. GARDNER: -- a mathematical estimate of the significance, and I think the fire protection is less subjective than the internal events. It makes it more difficult and it makes the people that use it have to be more sophisticated in their capability to understand risk and how to use it, but it's not perfect, and we're going to use it, and just like with the other one, we'll probably be revising it before long.

Continuing on with operator recovery action, when the fire has been somewhat put out, there's still smoke removal, de-watering.

At FERMI, we had six or seven hundred thousands of gallons of water to -- because of surface contamination -- to decontaminate, and you'd be surprised at the public outcry when you tell them you're going to put it through filters and send it out to the lake.

DR. POWERS: I'm not going to be surprised.

MR. GARDNER: That's quite tricky.

Control re-unitization -- you try to re-establish your power systems that you've lost, get all your systems back now, instead of the ones that got you to safe shutdown, and return to service.

We also do a manual fire-fighting capability assessment just to assist us with the SDP if it becomes an issue.

As parts of the design aspect we're looking at -- and that's slide 63 and 64 -- we're looking at electronic circuit analyses common enclosure, high-impedance faults, spurious circuits.

If you want to discuss a high-impedance fault, it's an arcing fault.

Any of those things I could talk to you about in specifics, but in general, just for the purpose of what we do, is we're looking -- as electrical engineers, we're looking at common enclosure, associated circuit faults.

We're looking at common power supply. This goes into breaker coordination, fuse coordination.

A high-impedance fault is not your classical volted fault. It's not the one where you're estimating the contributions of your inductive motors. As they start stopping, they will actually feed faults, and when you're doing a normal fault analysis, you have to get all your contributions.

In this case, you're just doing a -- assuming that the fault is what they call a arcing fault, and that actually can be of more problem than a volted fault.

DR. APOSTOLAKIS: How can you have a spurious signal from an open circuit? Can you give me an example?

MR. GARDNER: If you have a circuit that's supposed to be open and you have a dual ground -- first ground on one side of the contact that's open and then you ground the other side, you now create a bypass around that closed -- an open circuit.

DR. POWERS: The Europeans, in testing their new modern cable insulation, found out that open circuits became closed circuits, because there was some copper oxide in the material that got reduced by the boric acid or borate that they put into it, and open circuits all became closed. I mean it was a conduction pathway.

MR. GARDNER: Sure.

DR. POWERS: And so, needless to say, they've kind of redesigned that new super insulation.

MR. SIEBER: Why are high-impedance faults more significant sometimes than volted vaults?

MR. GARDNER: If you can visualize the fact that you have a distribution panel -- let's say it's feeding 125-volt DC and you're feeding, let's say, three loads that are part of your safe shutdown, and then you have four or five loads that aren't, but unfortunately, those four or five loads run through the fire area, and we will postulate that you will have multiple high-impedance faults on each one of those loads that runs through that fire area.

Each one of them could be an arcing fault, which means the current of that fault will be slightly less than its breaker.

So, the combination of all of those currents can equal the tripping of the supply breaker to the whole distribution panel, which cuts off the power to the one you needed to suppress the fire or to deal with the fire.

MR. GROBE: We have about 30 minutes left. We're still in fire protection, and then we had a discussion of on-line maintenance.

Is your preference to stay with fire protection?

DR. POWERS: I would like to.

MR. GROBE: Okay. And if we have a few minutes -- Laura, I'm kind of cutting you off, but -- Laura and Mike. If we have a few minutes, we'll talk about on-line maintenance; if not, then we'll just conclude with fire protection. And we'll skip the break.

MR. GARDNER: Any other questions about hot shorts, open circuits, high-impedance faults, common enclosure?

DR. POWERS: Well, you'll never get a resolution on that between the NRC and the licensees.

MR. GROBE: Well, you're not going to get it from us.

DR. POWERS: I understand. I'm asking for prognostication, not resolution here.

MR. GARDNER: I think you're talking about the classical question that's confronting us about whether a licensee has to assume multiple hot shorts versus a single.

That issue we wrote a TIA on, which is a task interface agreement, and we have not seen the definitive answer yet.

There have been meetings between the staff and NEI and the owners groups.

I believe, in talking to the staff, they're pretty sure that our position is going to be the position, but I'm sure if I talk to NEI, they'll probably tell me the opposite.

DR. POWERS: Are your licensees in this particular regional happy with that, or are they resisting?

MR. GARDNER: No, but Braidwood -- Commonwealth Edison is one of the licensees, and they were the basis for our task interface agreement. They emphatically said one.

MR. GROBE: Put some time-frames on it, Ron. The TIA was based on Dresden, wasn't it, and that was about four years ago?

MR. GARDNER: Yeah, four years ago, I'd say, we wrote that, right.

MR. CALDWELL: I think we were the first region to really address the issue.

MR. GARDNER: It might have been, yeah.

MR. SINGH: Hey, Ron? Does Perry have that same similar problem?

MR. GARDNER: Who's that?

MR. SINGH: Perry?

MR. GARDNER: As far as their position?

MR. SINGH: No, I mean do they comply with their hot short issue?

MR. GARDNER: When you're talking about hot shorts, you mean do they assume multiple hot shorts?

MR. SINGH: Yes.

MR. GARDNER: I'm not sure. We're getting ready to go to Perry, and one of the next two inspections will be Perry, and we'll find that out.

I didn't keep a catalog of who does what. We're going to pick them up on the FPI, and hopefully that will give NRR an opportunity to come to one position or the other when we find it during these inspections.

MR. CALDWELL: I think we scheduled our fire protection inspections to target those plants where we thought we would probably have the most question in terms of their approach, if I recall correctly.

MR. GARDNER: We did Braidwood partially for that reason. That was the first one. Perry is number three, and we're going to be looking at that.

Actually, we also picked Quad-Cities in December, because Quad-Cities will complete, we hope, all of the modifications necessary to establish full compliance with Appendix R by November, which would make our December inspection like just in time, and if you have any questions on Quad --

DR. APOSTOLAKIS: Was there a high number?

MR. GARDNER: Yes.

DR. APOSTOLAKIS: The result of wrong analysis, very conservative analysis, or are they actually doing anything about it?

MR. PARKER: It depends on who you ask.

DR. APOSTOLAKIS: See, that's why I'm asking.

MR. PARKER: The licensee pointed out that there were some over-conservatisms in their analysis. So, they had to make some bounding assumptions.

So, that was part of it, and then they did implement some compensatory actions and were making modifications, because they did agree that their plant had a high fire risk vulnerability, but they claimed the 5 times to 10 to the minus 3 was really over-stating the full as-found condition, if you will.

MR. GROBE: You have to appreciate that the refined analysis with significant improvement is still 5 10 to the minus 5. It's not low-risk, but it's equivalent to their --

DR. APOSTOLAKIS: Just from fire.

MR. GROBE: Yeah, just from fires.

We have two more topics. One's the SDP, which I sense a lot of familiarity with. The other is -- we've put together some slides on Quad, if you guys are particularly interested in Quad.

DR. POWERS: I think we can get Quad from another route.

MR. GROBE: Okay.

MR. GARDNER: Okay.

I can finish the last two slides, then.

Sixty-five is where I was headed.

The next, baseline use of risk information at the baseline fire protection inspection -- and as I tried to state earlier that both the triennial and the resident inspections are using risk information to guide where they look and how significantly and deeply they look when they pick those areas; also, that the fire protection significance determination process is in its own compartmentalized document, and it's IMC-0609, Appendix F, and that's a good document to have available if you're going to be following fire protection issues.

DR. POWERS: At least in the version they gave us, there's an egregious typographical error in Appendix F. When you go through the calculations, you come up with --

depending on how you read the typographical error, either with astronomical numbers for any plant or minuscule numbers for any plant.

MR. GARDNER: We had tried it a few weeks ago at Brookhaven, and we didn't find any errors like that, so maybe the version we had was a later version.

Slide 66.

We would expect that the resident inspector, with their understanding of the fire protection issues and the complexity of the SDP, would only be involved in phase one screening.

If it looks like it had to go further, they would engage the region and the SRAs.

The inspection team, however, will do a phase one and a phase two, and if, in fact, we find that the phase two is heading us towards other than green, we would continue to do that, and that would be a more protracted evolution, with inputs from the licensee and more refinement with the SRA in helping us to look at our assumptions and seeing if we were overly conservative.

That was all I had prepared.

Jack indicated I have some material on Quad, but you indicated you didn't need that.

So, any questions you have on this material, I'd be glad to discuss.

MR. SIEBER: I think your presentation was very good.

MR. GARDNER: Thank you.

MR. GROBE: You can tell, this is about as excited as Ron gets, but this and the SSDI inspection we feel are very meaningful inspection efforts. You can really find stuff with this kind of inspection, and we're excited about both of those inspection efforts, very detailed, design-oriented, intrusive-type inspection.

If there's a problem, we could find it with this type of inspection.

MR. PARKER: I hope all our inspections are meaningful, though.

MR. GROBE: Yeah, but these are new tools that we didn't have before.

DR. APOSTOLAKIS: There are no performance indicators. They are planning to --

MR. GARDNER: No, sir. I think we haven't -- we're not smart enough to figure out which ones would be relevant.

DR. POWERS: Great men have tried.

MR. GARDNER: That's right.

DR. APOSTOLAKIS: How about fires, the number of fires?

DR. POWERS: It just turns out to be meaningless.

MR. SIEBER: They're mostly wastebasket fires.

MR. GROBE: And they're fairly frequent. You'll have a couple of fires a year.

DR. SEALE: Any good performance indicator is something that is not so rare that, in itself, it's a catastrophic event. So, you want something that happens every once in a while as a performance indicator.

DR. POWERS: Yeah, but wastebasket fires just aren't going to do anything.

DR. SEALE: I agree with you. I'm saying the frequency is not the problem. It's the wastebasket.

MR. GARDNER: I think we're also concerned, though, that a low number might lull you into a false sense of security.

So, there's some danger on taking any number and saying that is going to make your determination as to whether you're there or not as far as defense-in-depth.

DR. POWERS: With NFPA, when they tried to do it, they ended up putting in this incredible core of Appendix R, essentially, kinds of inspections and deterministic activities, because there was no way to say, okay, if they're doing all this, this indicator will indicate that.

MR. GROBE: I think you could develop an indicator that could result in your ability to cut back in the classical fire protection inspection area, but this and the

SSDI are very design-oriented, and I can't think of any performance indicator that could result in you giving justification to cut back in this area, because this is focusing not just on ignition sources or initiating events, those kinds of things. I think we could develop an indicator in those areas. It's focusing on did your engineers do a good job designing it, in a very complex design.

DR. POWERS: And are your people maintaining it and subverting it inadvertently?

MR. CALDWELL: Right. In actuality, the performance indicator is the results of the inspections over a period of time.

DR. POWERS: Yeah, that may be it.

MR. PARKER: When we met in Region II to discuss inspection resources and how we were going to implement the new program and what is the appropriate estimated number of hours, there was discussion about the frequency of these inspections, and I think there was the recognition across the regions that the safety system design inspection and the fire protection inspection were -- the two inspections where probably the most risk-significant findings will emanate, and as a result, do you want to continue with that intrusive inspection, versus looking at performance indicators, and so, there was that discussion.

DR. POWERS: One question, in thinking about smoke, are you staying aware of these difficulties people are having with their assumptions on how well-sealed their control rooms are?

MR. GARDNER: You mean to keep the smoke out of the control room?

DR. POWERS: Yeah, leakage rates.

MR. CALDWELL: The control room habitability has been a problem as long as I've been in this agency.

DR. POWERS: We're seeing occasions of enormous discrepancies between what's assumed in the FSAR and what the actual tracer gas types of mixing are. I mean they're just not even close. I mean it wasn't even a good guess. And it's really because the FSAR is writing about what somebody drew up on a piece of paper.

MR. GROBE: That in-leakage is when the door is closed. If you have an event, that door is going to be opening and closing on a regular basis.

DR. POWERS: That's another question that comes up on the leakage test, is there's a lot of other things happening. The HVAC system gets manipulated around and changed, may be off, and whether the test actually relates to the environment during an accident, but over and above that, even with the test and the conditions you have, we're seeing huge discrepancies.

MR. SIEBER: Well, the duct work is like a furnace duct in your house, and it deteriorates, too. They use those Pittsburgh seams to hold them all together.

MR. GARDNER: Well, there's also an over-reliance on IEEE-383, I think, cable fire tests, to say that that's the end-all to say I won't catch fire.

In reality, all that does is raise the ignition temperature, but once it's ignited, it burns faster and hotter than a non-IEEE-383 cable.

DR. POWERS: I've heard that.

MR. GARDNER: It's true.

DR. POWERS: I have not seen the data, but that's definitely what I've heard.

MR. GARDNER: Yeah.

DR. POWERS: But on the other hand, we also find that aging cables are less combustible.

DR. SEALE: They've already evaporated.

DR. POWERS: It's actually a cross-linking thing and you get rid of the plasticizers, which are the real flammable part.

MR. GARDNER: It's the oxygen scavenging from the neutrons, yeah.

MR. GROBE: Any other questions?

Laura, you're on.

MS. COLLINS: We can be brief. We don't have that many slides. I'll answer whatever questions you have.

DR. POWERS: If you haven't learned by now, the ACRS has an infinite supply of questions.

MS. COLLINS: I'm going to talk on the topic of risk associated with on-line maintenance, and we have a procedure in the new baseline inspection program that's carried out by the resident inspectors, and it's actually 7111.13, titled "Maintenance Risk Assessments and Emergent Work."

Part of that inspection, we would sample between five to eight maintenance activities per quarter, and that's dependent on a unit size, and I'll say right up front that this is a lot more emphasis on reviewing these types of assessments than we had under the old core program.

The concept is to evaluate the effectiveness of the licensee's risk assessment and control of the maintenance activities.

That's the objective, and this was really developed because we knew (a)(4) was coming, (a)(4), the requirement of the maintenance rule, which, really, under (a)(3), we previously said they should do a risk assessment, and they were for the most part, but we didn't have -- it wasn't really a requirement, so now it's becoming a requirement.

Since we knew it was coming, we put it in a baseline inspection program and we've been doing it kind of ever since then, but I will say, because of that, and because (a)(4) isn't fully in effect, we really anticipate more changes to this procedure.

We've had two throughout the pilot program. The guidance is changing. My understanding is that NRR is even going to come out to the region and do a temporary instruction, go out to the licensee's facility and really see what they're doing and what we should be looking at, to help us, I think, define what a finding is going to be in this area.

On the next slide, I've just written down the inspection objectives from the inspection procedure.

We looked at planned work. We also look at emergent work, and then the last bullet is verifying that the licensee has adequately identified and resolved problems in this area, and that's just a standard thing we have in all of our inspectable areas.

If they come up with some kind of problem in this area, we can select that and go in and see what they do about it to fix it.

MR. BONACA: Some of the emphasis in -- you know, in the rule is manage risk. Any consideration to limit the risk? That's a question which is somewhat open, because in absence of criteria and in absence of tools to quantify the risk, I mean it seems to me like there is some option there.

We were shown yesterday that, you know, increasing risk from a baseline of about a factor up to 10 is not considered high enough increasing risk that you have to go to management for approval. It's a judgement. It depends on how low your baseline is.

So, any sense on how this is being implemented at the sites?

MS. COLLINS: Well, we can go on to the next slide, where I start to talk about our inspection techniques.

MR. BONACA: Okay.

DR. WALLIS: I was going to ask you -- I see you're evaluating effectiveness several times and you're looking at adequacy. Is there a lot of judgement involved in this?

MS. COLLINS: Absolutely.

DR. WALLIS: It's all judgement.

MS. COLLINS: It's all judgement at this point, and we're looking forward to new guidance and new information from NRR, as I said a minute ago, to what would be a finding in this area.

Even right now, we have preliminary information in our inspection procedure that I understand is from the NEI guidance which we're endorsing with our reg guide, and there's different levels with increase in CDF and increase in CDP, and I had an inspector call me recently because I was in a pilot program and say, well, I'm here at this plant and they don't calculate increase in CDP, they only do CDF, what do we do about that?

I don't know what we do about it at this point.

You know, we're going to -- those are the kinds of questions and some of the feedback, I think, that we've been giving throughout the pilot program to the program office, that not only do we need guidance for licensees, but we need the guidance for the inspectors to say what is really an issue in this area?

DR. APOSTOLAKIS: Now, the NRC staff developed this upper bound on the CCDP of 5 10 to the minus 7, I believe. Why can't we use that here?

I mean instead of having a licensee say, well, gee, I'm really managing risk, because under exceptional circumstances, all I'm doing is raising the CDF by a factor of 3 and I'm already very low, but in the context of, what was it, allowed outage times, they came up with this number of 5 10 to the minus 7, which means about three hours you have a CDF of some value.

Can that be -- you know, lacking anything else, why can't that be a starting point for evaluating or verifying how the licensees manage the risk?

MR. PARKER: There are some thresholds in some of the documents. The problem I think Laura is pointing out is there's no requirement.

So, if the licensee were to exceed those and the residents and the SRAs or challenge the utility, what do we do with that and how do we address that?

DR. APOSTOLAKIS: The 5 10 to the minus 7 is one of the Region V risk-informed regulatory guides. It may not be a requirement here.

DR. POWERS: It's an allowed outage time.

DR. APOSTOLAKIS: Yeah. Well, it's an increase, an increase in CCDP.

MR. PARKER: But I think Laura's point is that this task group is looking at the maintenance rule, implementing procedures associated with (a)(4) here. We would assess that, you know, what is a finding.

If we identify that the licensee did a CCDP and determined it was greater than 5 times 10 to the minus 7, in what context do we put that on the table, what's our assessment of that, etcetera.

DR. APOSTOLAKIS: I'm not saying this is the answer. I'm saying at least there is a starting point there where somebody thought about it and came up with a footnote that is really very nice. We don't know what to do, but let's assume this.

MR. BONACA: Yeah, because -- in part, also, is because -- I mean the risk increases associated with how many components you're taking out of service and what kind it is.

Now, especially for those power plants that are on 24-month cycles, they have plenty of time over two years to do maintenance on-line without taking multiple components out of service.

So, what does it mean, this managing risk? I mean does it mean that since I can go up to whatever I want, I can take five components out of service simultaneously.

There is a balancing act there that I don't think has been properly defined, and that's why I was asking those questions.

DR. APOSTOLAKIS: Maybe that will be the next round of refinement. We haven't really had a chance to think about these things.

MR. CALDWELL: First of all, at least there's a recognition that they have to put something in place to do an assessment of it.

I guess I'm a little removed from the inspection program, but what Laura is saying -- we don't have the criteria or guidelines yet to do an assessment of it. But at least we're requiring them to do an assessment.

As we get smarter, those licensees that -- they actually know what is good and what's bad. Those licenses that -- because we don't have the tools yet or the whip or whatever, the lever -- that want to push the envelope will be the ones that we catch as we get smarter and come up with our criteria.

Those that are good and smart and know how to do this -- they'll already have set themselves a limit that will be within where we end up.

DR. APOSTOLAKIS: I think the staff, though, at headquarters should think a little bit about this, because this is very important.

Now, yesterday, as Dr. Bonaca said, we were shown some spikes in the core damage frequency, but I don't recall any discussion of the duration.

MR. BONACA: There was no duration.

DR. APOSTOLAKIS: There was no duration. It was just the core damage frequency went up, and then they said themselves, regions -- you know, we told them to change their names, but they call them now very high risk, high risk, and so on.

But they were prepared to go up by a factor of 10.

Now, you might say, well, gee, they're already starting at 5 10 to the minus -- no, 1.5 10 to the minus -- so, why can't they go to 10 to the minus 4 or a little higher?

MR. BONACA: And they implied that they could higher if they get management approval.

DR. APOSTOLAKIS: I guess the issue you're raising is, even if the CDF goes up by some number, it's still not clear that adequate protection is still preserved.

MR. BONACA: Absolutely.

DR. APOSTOLAKIS: I mean that's even higher.

MR. BONACA: The other issue is, even if you stay within a certain limit, wouldn't just limiting the number of components you're taking out of service mean good management?

I mean there is the other issue that it doesn't say that you have the liberty to go wherever you want, as long as you don't meet a certain number. There is another way to do it, which is to only limit the number of components you're bringing out of service.

DR. APOSTOLAKIS: But then again, you are going back to the deterministic way. I would be reluctant to do that. I would like to explore the CDF and CCDP first. Instead of calculating probabilities of minimal cut-sets, count the number of events in there. So, let's be consistent in our evolutions.

I think we should explore the CDF and CCDP issues, see how far we can go with those, and if necessary, then we'll go back and limit it more.

MR. CALDWELL: For those licensees that have real strong management, that are interfacing with the plants on a day-to-day basis, they're no different than we are, and they're old school, too, deterministic approach.

For those licensees, they'll probably do that. The manager is going to say I don't want the diesel -- I don't want these six components being taken out at the same time, I don't care what it says, that doesn't feel good to me, and you know, until we have a better approach, we're going to have to rely a lot on licensee management in order to keep their plant safe.

MS. COLLINS: Some of them are pretty developed. I mean they already have these kinds of limits. The limit I've seen in the guidance that's coming out -- CDF -- it says something like 10 to the minus 3 should not normally be entered.

Well, the procedure I'm familiar with is not even close to that. So, they're already way far away from that.

The other thing that I think is kind of self-limiting is resources, taking these systems out of components. Oftentimes, they have LCOs that -- they don't have enough resources to take all this stuff out, equipment, so I think it's naturally limited that way.

DR. APOSTOLAKIS: Let me ask you a question. In your view, should the criteria be bounds on CCDP or CDF?

MR. PARKER: Our procedure has both in it.

MS. COLLINS: Yeah.

DR. APOSTOLAKIS: Very good.

MR. PARKER: It has a threshold of the ICCDP of less than 10 to the minus 5 and ICCF less than 10 to the minus 3.

So, it's asking the inspectors to look at that if they exceed either of those thresholds, because some utilities, like Laura pointed out, are using CDP, some are using CDF.

But you want to -- CDP, I believe, would be looking at the duration, and you want to factor that in there.

DR. APOSTOLAKIS: If you say that you have an ICCDP of 10 to the minus 5, that's almost two orders of magnitude greater than what the NRC staff had proposed.

Now, you are NRC staff, too. The other staff.

Yeah, we have to really work on those things and make sure that we have some consistency.

MR. PARKER: That's instantaneous, too.

DR. POWERS: When you look at these plants, do you find them taking out multiple systems at the same time?

MS. COLLINS: We do find that there are multiple systems or multiple components at the same time.

DR. APOSTOLAKIS: What's multiple?

MS. COLLINS: There could be two or three, but --

DR. APOSTOLAKIS: Two or three systems?

MS. COLLINS: Yeah.

MR. PARKER: Some plants may have divisional outages and take out all their divisional equipment or any maintenance on a particular division at a time.

MR. DAPAS: Train outages. They'll take out maybe RHR and the charging pump, let's say, associated with the same train.

DR. APOSTOLAKIS: But that doesn't defeat the whole system, does it?

MR. DAPAS: Sure.

MR. GROBE: Sure. They'll do maintenance on several systems on the same train.

MR. CALDWELL: Multiple systems within a given train.

DR. APOSTOLAKIS: Is it fair to say, Laura, that there is a need for guidance in all three bullets?

MS. COLLINS: Oh, yes, absolutely, and we know that there are major changes coming to this. I mean we already know that.

Of all the procedures that we have, this is probably the one that is sort of newest to the resident inspectors and where they need additional guidance, and I think that's a well-known fact.

DR. APOSTOLAKIS: Okay. Thank you.

MS. COLLINS: When we go to slide 70, though, and talk about inspection techniques, kind of the way -- what we do -- we would probably select a planned work week, a week or so in advance, or if it's emergent, you know, we don't have that time, and we focus on that work that does involve the risk-important systems and components.

We also tend to focus, I think, on unique activities or first-time evolutions, and then we take that safety assessment, we try to understand what the assumptions are, we talk about the licensee's PRA staff, and their operations staff, and the next week, perhaps when the work is going on, we evaluate the plan and the safety assessment against, really, the conduct of the work to make sure that it's consistent, and this also applies to shutdown risk assessments, where configuration of the plant is changing, and we try to know up front what the assumptions are, this has got to be back in service before we take this out. Those are the kinds of things we would go out and check.

MR. CALDWELL: Laura said something about we'd focus in on first-time evolutions.

I can tell you that once on-line risk started, the majority of the transients or events that were caused were because they transitioned from an activity they did while shut down to an activity while they were operating and didn't fully evaluate how they were going to get there, and they either didn't tag out a component correctly or they operated a piece of equipment the wrong way or whatever that resulted in a transient.

So, it is a good area to focus on as they're moving to on-line risk.

DR. APOSTOLAKIS: Let's say you have a plant that's a 18-month cycle. If I look at a random -- at the plant at a random time during that 18-month period, is there a high probability that some on-line maintenance is going on?

MS. COLLINS: Yes, every week.

DR. APOSTOLAKIS: Every week.

MS. COLLINS: Yes.

DR. APOSTOLAKIS: So, I wonder, then, whether the -- what so-called baseline CDF is meaningful anymore. We should revise it to take into account this plant's on-line maintenance.

MR. DAPAS: Supposedly, the SDP accounts for that.

DR. APOSTOLAKIS: No, no, no, the baseline, the PRA itself.

MR. DAPAS: When you look at, if a component is out of service, what's the additional contribution to the baseline CDF, and there's some assumed amount of out-of-service time associated with that.

DR. APOSTOLAKIS: What I'm saying is you don't have a baseline. If your baseline is moved to the point where you have something --

MR. SIEBER: You already have assumed a certain amount of outage time per component.

DR. APOSTOLAKIS: Not with on-line maintenance.

MR. GROBE: With on-line maintenance, if you look at the fault tree, there's some component for equipment out of service time, which can be on-line, can be shutdown.

DR. POWERS: What George is saying, I think, is that that's gotten kind of averaged over the entire year, and in truth, it's peaked, it's spiked, and so, now he's moving from spike to spike with maybe a little trough in between or something like that.

DR. APOSTOLAKIS: What we used to call baseline CDF perhaps is not baseline anymore.

MR. DAPAS: It may not truly capture the risk posture of the plant at the time a piece of equipment is taken out of service.

DR. APOSTOLAKIS: This is a very interesting thing.

MR. BONACA: If they showed that they were integrating that value, as I've seen other plants do, to assure that you stay within the assumed unavailability in the IPE. So, I mean there is a self-controlling mode.

DR. APOSTOLAKIS: No, but what they showed us was that there was a line that said this is 1.5 10 to the minus 5, our baseline, and here we had a spike because we did this, then we had another spike because we did something else.

Now, Laura is telling me that actually they should have spiked every week.

MR. PARKER: There are typically spikes every week, but I think you're right, they generally --

DR. APOSTOLAKIS: If you have a lot of spikes, then --

MR. PARKER: It has to balance out, because they're looking at the availability and the un-availability, and that all should be modeled appropriately within the scope of the PRA.

I understand what you're saying as far as the spikes, and we need to look at it in a different context.

MS. COLLINS: The other part of the maintenance rule is sort of their annual assessment where they're supposed to be looking at that, and we also go in -- and the concept of balancing the unavailability and reliability, which I guess we assume that, if they meet their performance criteria for those systems and components, that they've achieved that goal.

So, that's under a different inspection procedure that's done by Division of Reactor Safety. They do that once a year.

DR. APOSTOLAKIS: Okay. I got the answer.

MS. COLLINS: Okay.

Page 70, the last bullet, I say consult with senior reactor analysts. If we have some kind of an issue -- and I say we haven't really decided what a finding in this area is -- the SDP doesn't apply to these findings. So, my understanding is that there is a SDP for these kinds of issues under development in NRR.

To date, we've just been using our best judgement and the judgement of the SRAs.

DR. POWERS: Your understanding is our understanding, and you've apparently seen just as much as we have.

MS. COLLINS: Okay. But I guess the good thing is, throughout the pilot program, we've seen pretty good programs with risk assessments, and we haven't identified what we believe to be any significant issues.

DR. POWERS: That does seem to be what we see. For these planned outages, they're doing good work, they're doing real good work, and there's an economic incentive, because people that do well-planned, well-thought-out work have short outages, costs less money to get more done.

The difficulty is what about unplanned and what you call emergent events, and how well is that going to be done, and I don't have a handle on that.

MS. COLLINS: I think in our experience we've seen it done pretty well, but we don't know what's coming.

DR. POWERS: Your experience is extremely important to me, because you have an experience that I don't, and so, I take your word very sensitively.

MR. DAPAS: There is a spectrum of performance depending on the licensee.

DR. POWERS: I'm sure that's true, but I mean if the general feeling is, hey, they're doing a pretty good job here, then I'm going to worry a lot less about it than oh, my god, can I tell you some horror stories.

MS. COLLINS: There are a couple of areas that I think are of interest to us, and that is how the licensee might evaluate initiating event frequencies or probabilities, which is kind of what I'm seeing in the guidance.

Other than weather-related, impending weather kind of problems, I don't necessarily see a lot of that, and I'm not sure how that will be done. So that's another area that I think we'll explore.

On page 71, inspection observations, again, I said --

DR. APOSTOLAKIS: Yeah, the second bullet -- would you elaborate a little bit? We don't have to go through all of them.

MS. COLLINS: Right. We have seen where the duration of the maintenance exceeds the planned duration, but if it doesn't exceed an LCO, there isn't much involvement we have other than a comment.

DR. APOSTOLAKIS: But this is common? Is this a common occurrence?

MS. COLLINS: No, I wouldn't say it's common.

MR. BARTON: It happens occasionally, yes.

MS. COLLINS: But we've seen it.

MR. BARTON: Because you have a system outage scheduled for 36 hours and it ends up 42 for some kind of problem, and that happens not too infrequently.

MR. DAPAS: And I just wanted to comment -- this has brought to bear an issue where the procedure would ask us to assess is the actual time to execute the maintenance greater than planned, okay?

You're asked to look at that as part of the inspection procedure. Then what do you do with that, because does that really translate to an increase in risk, and they're within the LCO time and they may be within the time assumed as part of your baseline CDF.

What do you do with that, and that's one of the questions that we've been wrestling with with the program office.

MR. BARTON: I think you understand why it is it happens, and if it's the same cause that always happens, then you've got an issue.

MR. DAPAS: You're right, but again, the result of that has to be some increase in CDF that crosses some threshold where you can land that issue with the licensee and engage them, versus an observation per se.

DR. POWERS: It's like drunk driving convictions. The penalties are very severe in New Mexico for the second one, but since they always excuse the first one, nobody ever has a second one.

MR. PARKER: We've seen that happen on occasion, and the SRAs have gotten involved on a few of the issues where the licensee's risk assessment assumed, let's say, 36 hours on a 72-hour, and they had some bounding analysis, and now, because of parts availability or some additional concern, they might have went up to the 72-hour, and so, we've asked the residents, that this is a good opportunity to challenge the utility on their risk assessment and their bounding analysis and go back to risk assessment and see if the licensee is comfortable with the new numbers, where it's taken them.

DR. POWERS: It's also a good vehicle for asking them about the uncertainty in their analyses, what kinds of things did they think about that might change their numbers?

DR. WALLIS: If this is a best estimate, then half the time the duration will exceed the plan, roughly speaking.

DR. POWERS: Based on the reports I see, I think most maintenance is less than the plan.

DR. WALLIS: Less than the planned time?

DR. POWERS: Yes.

DR. WALLIS: So, it isn't so bad that a few take longer.

MR. DAPAS: Getting back to Mr. Bonaca's point, I would offer that a licensee that is managing the risk would say, okay, if we run into a problem, then here is the risk if it takes 72 hours versus 20, and that's a sufficient increase, now we want to doubly insure we've got parts and we've, you know, done mock-up training or what have you to ensure the actual time is bounded.

DR. WALLIS: But surely all you're really interested in is the average over all the maintenance you do, and the fact that some may take longer and be a bit more risky doesn't matter, as long as it's compensated for throughout the year or whatever by the others that take less time.

MR. CALDWELL: We probably have a little more time than we anticipated. O'Hare is closed right now. So, we're calling on your particular flights to find out what that actually means.

My secretary is going to call and check and see if it means they've been canceled, delayed, or whatever, and then we'll let you know.

MR. GROBE: We can give you a nice list of restaurants.

MR. CALDWELL: Flying out of O'Hare and into National, which is what we do when we go to headquarters, your chances of one of the two of them getting there is 100 percent.

DR. POWERS: Now, I know why the risk analysts here are so busy. They're calculating the probability the boss is going to get back.

MR. GROBE: Other questions on 71?

[No response.]

MR. GROBE: Mike, do you want to go into a little bit of what you're doing?

MR. PARKER: Yeah. I just wanted to take a little time and go through some of the observations that Sonia and I had during our SRA site visits.

We went out to all the sites over the last -- probably -- I think it was six months to a year ago, and we went to each one of the sites together as a team and tried to get a pretty good idea of what tools the licensee has, how they're using them, and how they're integrating into the organization.

So, it was more of an observation visit to introduce ourselves, to go through the new inspection program, and how we're going to -- how we would like to deal with them on risk issues, but some of the things we found -- on-line risk assessments -- most of the utilities were using a probabilistic risk assessment such as Safety Monitor, EOOS, or Sentinel.

There were a few outliers out there that are still using deterministic. In other words, they're still using a matrix or procedure to look at things, and it's more of a defense-in-depth-type approach, and some of them also have pre-solved cut-sets that they're using on some of their on-line monitors, but it looks like quite a few of them, including Commonwealth, is moving to some very good systems. They're going to Sentinel at the Commonwealth facilities.

So, most of the utilities are using risk programs, and there's, I think, one or two outliers right now in our region that are still using matrix procedures.

Shutdown risk assessments -- the majority or all of them at this time are deterministic. Several of them are matrix procedures with defense-in-depth, and I'd say the majority at this time are using an ORAM-type program, outage risk assessment matrix, and that's defense-in-depth.

We have seen a couple plants that are in the region -- I mentioned Perry as an example -- that are looking at developing shutdown models right now. So, that's going to be very interesting seeing a full-blown shutdown model and how they're using that and integrating it into the organization and into outage planning.

So, it will be a very good tool, but they're completing that. They expect to use it the next outage, which is in February, and they're hoping to use it for some of their pre-planning activities right now, and they're going to tie it back in to -- they need to do some conversion and put it into Safety Monitor.

So, that will be one of our first plants in our region.

I know several plants out west are using shutdown models.

So, that will be very interesting.

As far as risk assessments, most of the utilities, I think, are doing some very good risk assessments. Generally that's involved with the work week managers and not the PRA organizations.

Generally what we've seen is the PRA organization or the corporate staff develop the tools and put them in place and then it's turned over to the line organization to look at normal work activities, and it's not until they've determined that they have a risk-significant configuration that they may have the PRA organization get involved and deal with the issue and look at the acceptability or challenge the model.

MR. BARTON: Well, don't they -- if they have any changes at all to that planned maintenance, don't they bounce that back off their PRA groups?

MR. PARKER: Right.

MR. BARTON: Okay.

MR. PARKER: But some of the organizations will have the line organization where they'll put it in the schedule and then run the program, and as long as the program is, let's say, a green baseline, they won't get involved.

So, to address George's question as far as what happens if they have a higher risk, do they try to balance that, some of the plants do, other plants will have like a 12-week rolling average or rolling schedule, where they have certain equipment that comes out periodically, and they will try to stick with that equipment at that timeframe and to complete that 12-week cycle. So, they've looked at certain combinations of equipment that they would like to take out at the same time.

So, they'll try not to manipulate that equipment and put it into a following week.

As far as integrating risk assessments, I think Laura mentioned that, in general, the information we're familiar with is licensees are doing a pretty good job at integrating their emergent work with the pre-planned, and we've seen a lot of occasions where the licensee has pre-planned activities, some equipment to identify degradation. They'll put off or defer or cancel some of their pre-planned activities so as not to incur that additional risk, and so, we've seen some good indications of that, which makes us feel pretty comfortable.

Maintenance rule (a)(4) -- as Laura mentioned, that's not out yet. I think that's supposed to take effect in November.

There are some direction coming out NRR right now.

There's two visits planned for Region III. There's a visit, I think, in the next few weeks that's tentatively set up to go to Braidwood, and with the region's assistance, they want the SRAs, the regional inspector, and then headquarter involvement just to see how Braidwood does activities. I think Braidwood was picked because they indicated they think they have a pretty good program in place. So, that's a one-day visit.

And then the other activity that's being planned is more of a comprehensive V&V inspection, and that's planned for Clinton, and that would be more than likely --

and I'm somewhat speculating, but I think it's to actually have the draft TI and see how the utility does things. So, it would be somewhat of a pilot or just maybe go through the exercise and see how our procedures develop.

MR. DUNLOP: I just got off a phone call a little while ago about the (a)(4) rule. NRR is not really going to prepare a TI. What they're going to do is -- in the verification -- is re-validate the new Attachment 13.

So, during the first survey visit to Braidwood, they'll figure out what kind of -- and at all the other regions -- they're doing five surveys -- they'll go out, look at the different types of assessments that the licensees are doing, come up with a new or revised inspection program procedure, and then, during the four verifications -- ours is at Clinton -- verify that the new procedure will work and it will be acceptable.

That's one change that we just found out, that I had just found out today.

MR. PARKER: That's Andy Dunlop. He's with the maintenance rule in Region III.

One of the challenges I think we're going to have in the maintenance rule -- and like we said, we don't know where it's all going, but we have some thresholds, there's some thresholds in some of our reg guides and other guidance, but I don't know how we're going to deal with the fact if the utilities exceed those thresholds and how they balance that and what tool do we have to encourage the licensee to reduce that overall risk, and so, those are questions that we have outstanding and we'll be involved with the development of these activities.

As far as risk assessments, I think, since the new inspection program, there's been significant implementation of the licensee evaluating risk.

In the past, as far as events, we've challenged the utilities, and we didn't see that they were truly assessing it.

So, I think the new revised oversight program has really forced the utility to look at some of those emergent work activities and the impact it has or transients, and we're seeing significant involvement on the part of the utility to assess that, and Sonia and I are actively involved in looking at the impact particular transients have on the plant, overall risk, and communicating that in our morning meetings and other avenues that we have.

We've also seen the utility and we've been strongly encouraging the utility to address the risk significance in LERs.

An LER asks the licensee to talk about safety significance of the event of interest, and we're seeing the utilities taking an opportunity to address what they characterize as the overall risk significance of the activity as part of the safety significance.

So, I think that helps the region and anybody that's following that particular activity to put it in perspective. It gives the licensee their first shot, and then certainly the residents and the SRAs are evaluating the risk significance of LERs.

The last thing is -- Sonia has already talked about how we're involved with the SDP process in the phase two.

Is there any questions?

That's all I have.

MR. BARTON: I want to thank you all for a real informative session and thank you for the work you've put into it.

I think, of the visits we've made, this has probably been one of the best if not the best, from my perspective. I don't know how the other members feel, but it's been very informative and a good dialogue and we learned a lot.

DR. POWERS: Yeah, I'd say that the meeting far exceeded expectations. I think it was an extremely good discussion among colleagues in these areas, and we got some things for us to go puzzle about.

I reiterate my belief that the wealth of experience that needs to be injected into this process, especially as we look to the next year of refining some of it, because you guys are really finding the rough edges, and I don't blame the people that put these new systems together.

They had millions of things to take into account, and they did a wonderful job doing as much as they did, and they knew they weren't going to get all the rough edges, and so, now, it's a process of making sure we find out about all those rough edges and do things, and what we just heard about on this maintenance rule business is something I hadn't anticipated.

We've clearly got to think about that a lot in the coming weeks.

So, it's starting to make me think. This is difficult, but I really appreciate it, and we had a fantastic visit out at Davis Bessie. They really pulled the stops out for us.

MR. CALDWELL: I thoroughly enjoyed this. I learned quite a bit.

I wanted to compliment the staff, those folks that are here. They did an excellent job, I thought, and Marc and Jack, and I certainly appreciate that, as I understand you did.

MR. BARTON: I think that's what was better. In our past visits, we've heard from the management of the region, and I think what was great today is we really heard from the people that are out there involved in the process and doing the work and having the interface with the licensees.

MR. SINGH: I just want to thank you, especially to Bruce Burgess, for his hospitality here. He has been really helpful, and he has worked since last October to arrange all this.

So, I really appreciate his help.

MR. CALDWELL: I think I ought to tell Bruce I appreciate it, too, because I jerked him around a bunch today, and it came out relatively smooth.

MR. BARTON: On that note, the meeting is adjourned.

[Whereupon, at 3:08 p.m., the meeting was adjourned.]

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III

VISIT OF THE ACRS SUBCOMMITTEES ON PLANT OPERATIONS AND FIRE PROTECTION

JUNE 14, 2000

OPENING REMARKS

DANA A. POWERS

Chairman, Advisory Committee on Reactor Safeguards
Chair, ACRS Subcommittee on Fire Protection

JOHN B. BARTON

Chair, ACRS Subcommittee on Operations

INTRODUCTION/ WELCOME

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Regional Administrator

Region III

Rev. 30, 05/0

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Lisle, Illinois

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James L. Caldwell, Deputy RA

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- Human Resources Staff — Dina Sotiropoulos (TL)
- Financial Resources Branch — Martin Kerlin, Chief
- Information Resources Branch — Reginald Mitchell, Chief

Division of Reactor Projects
Geoffrey Grant, Director
Marc Dapas, Deputy

- Reactor Projects Branch 1 — Mark Ring, Chief
- Reactor Projects Branch 2 — Melvyn Leach, Chief
- Reactor Projects Branch 3 — Michael Jordan, Chief
- Reactor Projects Branch 4 — Thomas Kozak, Chief
- Reactor Projects Branch 5 — Roger Lanksbury, Chief
- Reactor Projects Branch 6 — Anton Vegel, Chief

Division of Reactor Safety
Jack Grobe, Director
Steve Reynolds, Deputy

- Operations Branch — David Hills, Chief
- Mechanical Engineering Branch — John Jacobson, Chief
- Electrical Engineering Branch — Ronald Gardner, Chief
- Plant Support Branch — Gary Shear, Chief

Division of Nuclear Materials Safety
Cynthia Pederson, Director
Roy Caniano, Deputy

- Materials Licensing Branch — John Madera, Chief
- Materials Inspection Branch — Geoffrey Wright, Chief
- Decommissioning Branch — Bruce Jorgensen, Chief
- Fuel Cycle Branch — Patrick Hiland, Chief

REGION III ORGANIZATIONAL RESPONSIBILITIES

REGIONAL ACCOMPLISHMENTS

- Completion of pilot program for Quad Cities and Prairie Island
- Smooth transition to the revised reactor oversight program
- Completed PPR reviews (end-of-cycle for Pilot Plants)
- Effectively implemented the revised enforcement process
- Established resource accounting focus group and corrected resource expenditure documentation errors
- Improved information technology support for region
- Improved communications (internal and external)
- Wrapping up IMC 0350 programs for region

REACTOR PROGRAM IMPLEMENTATION

MARC DAPAS
Deputy Director, Division of Reactor Projects

JACK GROBE
Director, Division of Reactor Safety

DIVISION OF REACTOR PROJECTS

- 24 operating reactors at 16 sites
- 75 professional and administrative staff
- Branches organized to provide additional oversight for D. C. Cook

DIVISION OF REACTOR PROJECTS

- Inspection program management
- Continuous onsite inspection
- Residents are the focal point for agency interface with the licensee
- First responders for incident response

DIVISION OF REACTOR PROJECTS

SPECIFIC DRP INSPECTIONS

- Operations - observations of risk evolutions and event followup
- Maintenance - post maintenance testing and emergent work
- Surveillance testing
- Operability evaluations
  - 10 CFR 50.59 assessments
- Severe weather preparations
- Temporary modifications
  - 10 CFR 50.59 assessments
- Problem Identification and Resolution
- Performance Indicator Verification

Division of Reactor Projects

Division Director: Geoffrey Grant
Deputy Division Director: Marc Dapas

Branch 1
M. Ring BC
PE and RE (V)
Dresden
SRI and RI
Fermi
SRI and RI
Quad Cities
SRI and RI

Branch 2
M. Leach BC
PE and RE (V)
LaSalle
SRI and RI
Duane Arnold
SRI and RI
Kewanee
SRI andRI

Branch 3
M. Jordan BC
PE and RE (V)
Byron
SRI and RI
Braidwood
SRI and RI
Palisades
SRI and RI

Branch 4
T. Kozack BC
PE and RE (V)
Clinton
SRI and RI
Davis Besse
SRI and RI
Perry
SRI and RI

Branch 5
R.Lanksbury BC
PE and RE
Monticello
SRI and RI
Point Beach
SRI and RI
Prairie Island
SRI and RI

Branch 6
T. Vegel BC
PE and RE (V)
D. C. Cook
SRI and 2 RIs

Technical Support Staff
B. Burgess, TL
1 RE

Key: BC - Branch Chief
TL - Team Leader
SRI - Senior Resident Inspector
RI - Resident Inspector
PE - Project Engineer
RE - Reactor Engineer

Secretarial Support Staff
Div Secretary (V)
2 Full Time Branch Sec
2 Part Time Branch Sec

Division of Reactor Safety

- Engineering Inspections
- Safeguards Inspections
- Radiation Protection and Emergency Preparedness Inspections
- Operator Licensing
- Incident Response

Division of Reactor Safety

ENGINEERING INSPECTIONS

- Safety System Design
- Permanent Plant Modifications
- Maintenance of Licensing Basis
- Fire Protection
- Problem Identification and Resolution (DRP)
- Maintenance Rule
- Heat Sink
- Inservice Inspection
- Performance Indicator Verification

Division of Reactor Safety

SAFEGUARDS INSPECTIONS

- Contingency Response
- Access Authorization and Control
- Fitness for Duty and Behavioral Observation
- Problem Identification and Resolution
- Performance Indicator Verification

Division of Reactor Safety

RADIATION PROTECTION INSPECTIONS

- Operational Radiation Protection
- Radioactive Waste and Transportation
- Effluents and Environmental Radiation Protection
- Problem Identification and Resolution
- Performance Indicator Verification

Division of Reactor Safety

EMERGENCY PREPAREDNESS INSPECTIONS

- Emergency Exercise Evaluation
- Emergency Preparedness Program Review
- Problem Identification and Resolution
- Performance Indicator Verification

Division of Reactor Safety

OPERATOR LICENSING

- Initial Operator Examinations
- Senior Operator Examinations
- Operator Requalification Inspections
- Problem Identification and Resolution

Division of Reactor Safety

INCIDENT RESPONSE

- Maintain Facilities and Procedures
- Coordinate Exercises and Provide Training
- Interface with Federal, State, Local, and Tribal Counterparts

Division of Reactor Safety

Division Director: John Grobe
Deputy Division Director: Steven Reynolds

Electrical Engineering
Ron Gardner, Chief

Staffing
Two Lead Engineering Insp
Five Senior Engineering Insp
Five Engineering Insp

Functions
- Fire Protection
- Instrument & Control
- Environmental Qualification
- Electrical Engineering Analyses

Mechanical Engineering
John Jacobson, Chief

Staffing
Two Senior Engineering Insp
Four Senior Reactor Insp
Five Reactor Insp

Functions
- In Service Inspections
- Maintenance Rule
- Structural Integrity
- Mechanical Engineering Analyses

Operator Licensing
David Hills, Chief

Staffing
Six Senior Examiners
Three Examiners
One Licensing Assistant

Functions
- Initial Operator Exams
- Operator Requal

Plant Support
Gary L. Shear, Chief

Staffing
One Lead Insp (HP)
One Senior Rad Specialist
Five Rad Specialists
One Senior EP Analyst
One EP Analyst
One Emgcy Resp Coord

Functions
- Emer Preparedness
- Rad Protection
- Incident Response

Safeguards Staff
James R. Creed, TL
Senior Physical Security Insp
Three Physical Security Insp

Risk Analysis
Two Senior Reactor Analysts

Secretarial Staff
Adeline Saso, Team Leader
Two Branch Secretaries

EXPERIENCE - NEW INSPECTION PROGRAM

MARC DAPAS
Deputy Director
Division of Reactor Projects

JACK GROBE
Director
Division of Reactor Safety

EXPERIENCE - NEW INSPECTION PROGRAM

COMPARISON OF NEW TO OLD PROGRAM

1. Old: 33% core, 33% regional initiative, 33% special inspections

   New: 95% baseline loaded, 3% supplemental, and 2% special inspections

2. Old: Greater flexibility in applying inspection resources - Inspection procedure could be closed using judgement on whether intent met

   New: Increased structure - inspection procedure scope must be completed in its entirety - closely controlled inspection hours

EXPERIENCE - NEW INSPECTION PROGRAM

COMPARISON OF NEW TO OLD PROGRAM

3. Old: Followed deterministic process and enforcement policy regarding significance of inspection findings

   New: Inspection findings processed through Significance Determination Process based on using probabilistic risk analyses

4. Old: More direct observation of plant activities

   New: Increased emphasis on inspection preparation and in-office review

EXPERIENCE - NEW INSPECTION PROGRAM

COMPARISON OF NEW TO OLD PROGRAM

5. Old: 6 month inspection plan (strong emphasis on operations)

   New: 1 year inspection plan (balance between engineering and operations)
   - Use of PIs - operations and maintenance
   - Design emphasis in engineering

6. Old: Inspection resources - flexibility in utilization (N+1, inspection scope, regional initiative)

   New: Extended absences or vacancy requires backfilling to complete program

EXPERIENCE - NEW INSPECTION PROGRAM

COMPARISON OF NEW TO OLD PROGRAM

7. Old: Limited public awareness

   New: Greater opportunities for public awareness (PIs and inspection reports on Internet)

EXPERIENCE - NEW INSPECTION PROGRAM

DRP CHALLENGES

- Inspection planning
- Managing existing inspection resources/ fully staffing positions
- Feedback and dissemination of lessons-learned on inspection program (procedures)
- Initial implementation program review and self-assessment (April - 2001)

EXPERIENCE - NEW INSPECTION PROGRAM

DRS CHALLENGES

- Inspection planning
- Managing existing inspection resources / fully staffing positions
- Limited risk analysis resources
- Questionable value of some performance indicators (safeguards area)
- Different expertise required in engineering area
- Reduced focus on precursors to risk significant issues

SENIOR REACTOR ANALYST PROGRAM

SONIA BURGESS
Senior Reactor Analyst
Division of Reactor Safety

SENIOR REACTOR ANALYST PROGRAM

KEY ROLES OF THE REGION III SRAs

- Support the new oversight program
- Provide focused risk perspectives in regulatory decisions
- Evaluate risk of events and inspection findings
- Provide risk insights for inspection planning
- SRA initiatives

SENIOR REACTOR ANALYST PROGRAM

SUPPORT OF THE REACTOR OVERSIGHT PROGRAM

- Aid the Region III staff in use of the Significance Determination Process (SDP)
- Perform the Level 3 SDP analyses
- Support the assessment and planning process

IMC 0350 PROCESS

JACK GROBE
Director
Division of Reactor Safety

MARC DAPAS
Deputy Director
Division of Reactor Projects

IMC 0350 PROCESS

RECENT REGION III 0350 PLANTS

- Point Beach Units 1 & 2 (10 months 97-98)
- LaSalle Units 1 & 2 (26 months 97-99)
- Clinton (32 months 97-99)
- D. C. Cook Units 1 & 2 (33 months 97-00)

IMC 0350 PROCESS

Purpose:

- Establish Record of Regulatory and Technical Issue Resolutions
- Guidelines for Granting Restart Approval
- Provide Assurance of Safe Operations After Restart

IMC 0350 PROCESS

Objectives:

- Agency Coordination
- Coordination of Issue Resolution with Licensee
- Establish Oversight Plan
- Provide Method for Communicating to Public and External Stakeholders

IMC 0350 PROCESS

Oversight Panel Membership:

- Region Division Director (Chairman)
- Director NRR Project Directorate (Vice Chairman)
- Region Branch Chiefs
- NRR Project Manager, SRI, and SRA

IMC 0350 PROCESS

Panel Responsibilities:

- Review Reason for Shutdown
- Develop Plan & Restart Checklist
- Maintain Ongoing Overview of Licensee Performance
- Determine Inspection Scope
- Assess Readiness for Restart
- Brief Commission and NRC Management
- Meet with Licensee and Public
- Provide Written Basis for Restart Recommendation
- Regional Administrator Approves Restart Recommendation

IMC 0350 PROCESS

Post-Restart Activities

- Continued Panel Oversight
- Assure Safe Sustained Operations
- Review Post-Restart Issues

TRAINING ANALYSIS

JACK GROBE

Director, Division of Reactor Safety

MARC DAPAS

Deputy Director, Division of Reactor Projects

SONIA BURGESS

Senior Reactor Analyst, Division of Reactor Safety

DAVID HILLS

Chief, Operator Licensing Branch, Division of Reactor Safety

RON GARDNER

Chief, Electrical Engineering Branch, Division of Reactor Safety

TRAINING ANALYSIS

ENGINEERING INSPECTORS

Staffing Challenges:

- High turnover rate
- Evolving roles - changing expertise
- Long training period for qualification
- Pool of experienced resources limited (Engineering Firms, Utilities, Military)

TRAINING ANALYSIS

SAFETY SYSTEM DESIGN INSPECTION (SSDI)

- Multi-disciplinary team of 5 design engineers
  - Mechancial Engineers
  - Electrical Engineers
  - Instrumentation and Control System Engineers

TRAINING ANALYSIS

FIRE PROTECTION INSPECTION (FPI)

- Multi-disciplinary team of 3 appendix R engineers
  - Fire Protection Engineer
  - Instrumentation and Controls/ Electrical Engineer
  - Systems Operations Engineer

TRAINING ANALYSIS

- **Staffing Accomplishments**
  - I&C Engineer (PhD - extensive digital experience)
  - I&C Engineer (extensive Appendix R experience)
  - Electrical Engineer (extensive industry and inspection experience)
  - Mechanical Engineer (extensive industry and inspection experience)

- Challenges - Mechanical Design Engineer

TRAINING ANALYSIS

CURRENT AND PLANNED TRAINING

- External Fire Protection/ Appendix R Course
- Internal Heat Sink/ Heat Exchanger Course
- OJT by experienced inspectors and contractors
- Exploring with TTC and other regions discipline specific courses

TRAINING ANALYSIS

RESIDENT INSPECTOR

Staffing Challenges:

- High turnover rate (5-12 percent annually)
- Long training period for qualification
- Pool of experienced nuclear resources limited (Navy, Shipyard, Licensee)

TRAINING ANALYSIS

RESIDENT INSPECTOR

Staffing Accomplishments:

- Fully staffed resident inspection program (only 1 site N+1)
- Aggressive hiring program for reactor engineer positions

TRAINING ANALYSIS

RESIDENT INSPECTOR

Training Challenges:

- Chattanooga training courses limited
- Absence from site for extended periods
- OJT is a large part of training program

TRAINING ANALYSIS

RESIDENT INSPECTOR

Training Accomplishments:

- Reduced training length through hiring of high quality individuals
- High quality OJT is provided
- Extensive cross-training

TRAINING ANALYSIS

SENIOR REACTOR ANALYST STAFFING/TRAINING

Staffing

- Two Senior Reactor Analysts in Region III
- Consideration of additional risk trained staff

TRAINING ANALYSIS

SENIOR REACTOR ANALYST STAFFING/TRAINING

Training

- 18 - 24 month training/certification program

Classroom:
- PWR/BWR technical training
- Statistics and PRA training
- SPAR - NRC PRA computer model training

Rotation: 9 months of rotational assignments in NRR/RES/Region

TRAINING ANALYSIS

SENIOR REACTOR ANALYST STAFFING/TRAINING

Challenges:

- Succession planning for SRA position
- Extensive time needed for training/certification

Training Analysis

REGIONAL INSPECTOR RISK TRAINING

- P-111 “PRA Technology and Regulatory Perspectives”
- SDP training

Training Analysis

OPERATOR LICENSING STAFFING/ TRAINING

Staffing Challenges:

- Difficulty in Retaining Certified Examiners
- Difficulty in Finding Qualified Individuals To Hire
- Long Lead Time in Certifying New Examiners
- Significant Increase In Examiner Work Load Starting in FY-2001

Training Analysis

OPERATOR LICENSING STAFFING/ TRAINING

Staffing Accomplishments:

- Budgeted 9 Examiner FTE - Sufficient To Meet FY-2001 Demands
- Approved 3 Examiner Overages
- Hiring Progress

Training Analysis

OPERATOR LICENSING STAFFING/ TRAINING

Training Challenges:

- Training and Certifying Several Examiners Simultaneously
- Scheduling of Cross-Certification Training
- Substantial Portion of Examiner Staff Is Relatively New To Examination Work

Training Analysis

OPERATOR LICENSING STAFFING/ TRAINING

Training Accomplishments:

- Examiner Certification Progress
- Improved Examiner Proficiency

FIRE PROTECTION ISSUES

RONALD GARDNER
Chief, Electrical Engineering Branch
Division of Reactor Safety

FIRE PROTECTION ISSUES

In many instances, fire risk is comparable to or exceeds total risk from internal events

FIRE PROTECTION ISSUES

INSPECTION BASES

FIRE PROTECTION DEFENSE IN DEPTH:

- Prevent fires
- Rapidly detect, control, and extinguish fires
- Protect Safe Shutdown Capability
  - Barriers/ separation
  - Suppression/ detection
  - Procedures
  - Equipment/ systems

FIRE PROTECTION ISSUES

INSPECTION BASES

- No performance indicators currently exist

- New inspection program currently provides no inspection credit for self-assessment

FIRE PROTECTION ISSUES

RESIDENT INSPECTION

On a quarterly basis, residents tour 6-12 plant fire areas to observe:

- Combustibles/ ignition sources
- Fire protection systems, equipment, and features
  - Material condition
  - Operational lineup
  - Apparent operational effectiveness
  - Fire barriers

FIRE PROTECTION ISSUES

RESIDENT INSPECTION

On an annual basis, residents observe a fire brigade drill:

- Response time/ number of fire brigade members responding
- Protective clothing, breathing apparatus and fire fighting equipment
- Performance of supporting organizations

FIRE PROTECTION ISSUES

REGION BASED INSPECTION

Triennial Team Inspection Preparation:

- SRA Risk Insights:
  - Fire area risk rankings
  - Transient sequences

- 2-3 day full team information gathering visit

- Selection of three to five plant areas important to risk for the inspection plan

FIRE PROTECTION ISSUES

REGION BASED INSPECTION

Triennial Team Inspection Conduct:

- 200 hours direct inspection effort in 1-2 weeks
- Fire area boundary design
- Safe Shutdown system selection adequacy
- Systems separation evaluations against requirements of III.G.2 of Appendix R (Including area detection and suppression)

FIRE PROTECTION ISSUES

REGION BASED INSPECTION

Triennial Team Inspection Conduct:

- Fire suppression damage assessment for redundant trains of equipment
- Operator recovery actions
  - Smoke removal
  - Dewatering
  - Controlled re-energization
  - Return to service
- Manual Fire Fighting Capability Assessment

FIRE PROTECTION ISSUES

REGION BASED INSPECTION

Triennial Team Inspection Conduct:

- Circuit analysis (Fire-Induced Circuit Faults)
  - Common power supply concern
    - Multiple high impedance fault condition
    - Fuse/ breaker coordination

FIRE PROTECTION ISSUES

REGION BASED INSPECTION

Triennial Team Inspection Conduct:

- Circuit Analysis(Continued)
  - Common enclosure concern (Electrical fault protection from non-essential circuits)
  - Spurious signal concern
    - Hot shorts
    - Shorts to ground
    - Open circuits

FIRE PROTECTION ISSUES

BASELINE USE OF RISK INFORMATION

- Generic and plant specific risk information used to focus resident and triennial team inquiry on plant specific areas

- Fire protection Significance Determination Process (FP SDP) in IMC 0609, Appendix F

FIRE PROTECTION ISSUES

BASELINE USE OF RISK INFORMATION

- Resident Inspector applies FP SDP phase 1 screen only (May request regional office support)
- Inspection team applies FP SDP phase 1 and phase 2 while onsite
- NRC and/ or licensees refine FP SDP analyses as needed post-inspection

RISK ASSOCIATED WITH ONLINE MAINTENANCE

Laura Collins

Project Engineer, Division of Reactor Projects

Michael Parker

Senior Risk Analyst, Division of Reactor Safety

RISK ASSOCIATED WITH ONLINE MAINTENANCE

IP 1111.13 - MAINTENANCE RISK ASSESSMENTS AND EMERGENT WORK

- Sample 5 to 8 maintenance activities per quarter
- Evaluate effectiveness of licensee's risk assessment and control of maintenance activities
- Maintenance rule requires risk assessment for online maintenance (a)(4)
- Future procedure revisions expected

RISK ASSOCIATED WITH ONLINE MAINTENANCE

INSPECTION OBJECTIVES

- Evaluate the effectiveness of the risk assessment and verify how the licensees manage the risk

- Verify the licensee has taken the necessary steps to plan and control emergent work

- Verify the licensee has adequately identified and resolved maintenance risk assessment and emergent work problems

RISK ASSOCIATED WITH ONLINE MAINTENANCE

INSPECTION TECHNIQUES

- Select work week/emergent work on risk-important SSCs
- Review safety assessment/discuss with licensee PRA staff
- Evaluate conduct of maintenance against the "plan"
- Consult with Senior Reactor Analysts

RISK ASSOCIATED WITH ONLINE MAINTENANCE

INSPECTION OBSERVATIONS

- Variety of Tools/Techniques Used
- Duration of maintenance exceeds planned duration
- Failure to Use Assessment Tool
- Inappropriate Credit for Operator Action to Maintain SSC Available

RISK ASSOCIATED WITH ONLINE MAINTENANCE

SRA'S ASSESSMENT OF LICENSEE RISK TOOLS AND SITE VISITS

RISK ASSESSMENTS

- Online Risk Assessments - Probabilistic/Deterministic
- Shutdown Risk Assessments - Deterministic

EMERGENT WORK

- Licensees Performing Risk Assessments
- Typically Performing Integrated Risk Assessments
- Maintenance Rule a.(4) Will Require Risk Assessments

RISK ASSOCIATED WITH ONLINE MAINTENANCE

SRA'S ASSESSMENT OF LICENSEE RISK TOOLS AND SITE VISITS

EVENT ASSESSMENTS

- Trend Toward Licensees Performing Risk Assessments Of Events
- Typically Addressing Risk Significance In LERs

SRA INTERFACE WITH LICENSEES/INSPECTORS

- Involved In SDP Process
- Assist Inspectors with Phase 2 and Conduct Phase 3 SDP Evaluations
- Interface with Licensee