Official Transcript of Proceedings ACRS-T-3322

NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards
Plant Operations and Fire Protection
Subcommittees Region II Visit

Docket Number: (not applicable)

PROCESS USING ADAMS
TEMPLATE: ACRS/ACNW-005

SISP - REVIEW COMPLETE

Location: Atlanta, Georgia

Date: Thursday, August 25, 2005

Work Order No.: NRC-549 Pages 1-138

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

August 25, 2005

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

PLANT OPERATIONS AND

FIRE PROTECTION SUBCOMMITTEES

REGION II VISIT

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Thursday, August 25, 2005

8:30 a.m.

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Conference Room 24T20

Sam Nunn Federal Center

61 Forsyth Street, N.W.

Atlanta, Georgia

PANEL MEMBERS:

JOHN D. SIEBER, Chairman

VICTOR H. RANSOM, ACRS

GRAHAM B. WALLIS, ACRS

DANA A. POWERS, ACRS

THOMAS J. KRESS, ACRS

RICHARD S. DENNING, ACRS

MARIO V. BONACA, ACRS

WILLIAM J. SHACK, ACRS

STAFF:

RALPH CARUSO, ACRS Staff

ASHOK C. THADANI, ACRS Staff

JOHN T. LARKINS, ACRS Staff

W. BILL TRAVERS, NRC Region II

VICTOR M. McCREE, NRC Region II

JOE SHEA, NRC Region II

I-N-D-E-X

P-R-O-C-E-E-D-I-N-G-S

MR. SIEBER: This is a continuation of the ACRS meeting with Region II personnel, and the portion of the ACRS that are here today are the Pant Operations Subcommittee and the Fire Protection Subcommittee which comprises the bulk of ACRS members, so there's only a couple that are absent.

I would welcome Bill Travers, as he has welcomed me, and as an old friend, and I would report to you that your team did an excellent job yesterday in their presentation. It was very efficient and forthright, and for me, and I'm sure the rest of the members, I gained confidence in the agency's ability to handle the issues that come forward from licensees, and particularly some challenging applications that lie before us right now.

And that was one of the purposes of our visit was to get a handle on TBA's applications for Browns Ferry for license renewal, extended power up-rate, combined with the restart activity which looks almost like starting a new plant.

And so I think that will be a challenge for both the region and the headquarters staff and for us to understand it and be able to separate the issues and combine them in a way that will allow us to make

good decisions.

And so I thank you on behalf of the subcommittees for the work that the region is doing in that regard, and since they visit us from time to time at White Flint and report their findings to us, I've always had that confidence in Region II personnel. I also read the website that has your inspection reports.

I would point out that our agenda calls for us to conclude by something like 12:15 today, and for me, my next two days of travel must work like clockwork. I'm going to Montana but I have to pick up my wife and mother-in-law on the East Coast to accompany them out there, and every connection looks to me like a bad one, and so I have to leave promptly, and in the event that we aren't done, I don't want to cut short any of the discussion that will go on. I would ask Dr. Powers to take my place to conclude the meeting.

So with that, I'd like to ask Dr. Travers to give us a little introduction.

DR. TRAVERS: Thanks, Chairman Jack. It's great to see you. Glad the ACRS could come to Region II. It is a good organization and I'm glad you've had the benefit of some of the presentations yesterday.

I'm sorry I couldn't be here for the first half of the first day that you were able to take advantage of some of the information developing here at Region II.

There are a lot of challenges in Region II and obviously a lot of challenges within the agency, and the Southeast seems to be the targeted area for some of the projects, probably not unsurprisingly, that are being developed, and so we're extremely interested in being ready and prepared for the new work.

But the fundamental job that we have on a continuing basis is safety inspection at both nuclear power plants and all of the fuel cycle facilities across the country that are organized under Region II. And that's the reason I was out in Washington at Framatone Richmond yesterday to accompany Commissioner Jaczko, and for the first time myself have the advantage of that tour.

We certainly look forward in the future, as we have in the past, to working with ACRS. You are also obviously going to be challenged on some of this new work as it develops, if it develops, and so we'll need to assure that we have the same kind of good coordination and interaction with ACRS as we pursue these matters.

There's a lot on the plate, and I think today's first discussion actually, that Vic McCree is going to lead us through, will underscore the challenge we have in the most important element as I see it, and that the personnel, the people side of NRC programs.

NRC, in my sense, has always been effective largely or most importantly as a function of the people that work here, and so that's not going to change. Any organization is really defined by its personnel and the people that work.

I've been lucky enough to work in enough jobs to see NRC in a broad scope fashion, and I can tell you my experience here in Region II reinforces my view, a similar one I think that you share, that we're very fortunate to have a very professional team here at NRC.

But again, welcome, glad you could come.

MR. SIEBER: Thank you.

MR. McCREE: As Bill has indicated, and certainly made it very clear to the management team, our people are our greatest asset. So the management team, including myself in the Division of Reactor Safety and Joe in the Division of Reactor Projects, spend a considerable amount of time and effort focused

on identifying our needs, our skill needs, where we are, recruiting, hiring, developing, and putting in place an environment that's enriching enough and focused enough that people feel like staying here. We focus on retention.

But I wanted to take a while to talk about Joe and I, our use of the Strategic Workforce Plan, something that we've engaged in for the last two years, as well as our recruiting philosophy and strategy; the use of the Division of Reactor Projects Resident Inspector succession Plan which Joe is going to speak, as well as the Division of Reactor Safety Skills Matrix, both of which, again, are tools to help us to the end of getting good people onboard; and then talk about staff development training and end with just an overview of demographics that help drive what we do.

The Strategic Workforce Plan is, as you may be aware, an agency initiative of several years ago to address our current and long-term successor planning needs. All staff have to use that web-based tool to enter their skills and their knowledge.

Management looks at it to confirm their skill and knowledge level. We use it to determine where we recruit, how extensively we recruit, and it

also facilitates the technical Training Center's development of the training program that all of our staff have to take advantage of.

Using that tool does help to increase our efficiency and effectiveness. Prior to that, while we made it work, it was certainly less efficient than it is now. So it's a very helpful tool for us to use the Strategic Workforce Plan.

Next slide, please. Our recruiting philosophy and strategy. We've learned over the years that we have benefitted in Region II when we attempt to target folks who have some connection to the South, to the Southeast. We've targeted our recruiting efforts primarily to southern universities, as well as other locations in the South, and that's really helped us in terms of identifying people and also retaining them. When they have a connection to the geography, they tend to want to come and they tend to want to stay. So that's helped us tremendously.

We've used tailored vacancy announcements, specifically -- and I know Joe is going to speak to this -- we've tried to target our vacancy announcements so that we get the people that we want to apply for jobs.

As an example, in our Resident Inspector

Program, about five years ago we were hiring people for the position that they would occupy once they joined us, as a project engineer, for example, when we really wanted those people to develop to become residents.

So we changed the title of that announcement so that it was a Resident Inspector Candidate Development Program and were able to draw in the operations-oriented people rather than the project management experience that we were getting under that previous posting. That's helped us significantly.

Again, we have targeted universities in the South, in the Southeast, such as Georgia Tech, Virginia Tech, NC State.

MR. WALLIS: When you target them, what sort of response do you find that you get from these universities?

MS. McCREE: The response that we get is a very positive one. We've identified what we call champions. In fact, across the agency we've identified champions for specific universities. We go and visit the different schools and departments that we're targeting, Nuclear Engineering departments at Georgia Tech and NC State, South Carolina State, and others.

DR. TRAVERS: Graham, just as an example -- Georgia Tech is just four stops up, we live next door -- about six months ago we had a group of students come over and I think we've actually gotten some fair interest from the group. We spent the day with them, had the chance to interact with them and some of the different disciplines.

MS. McCREE: It's the student chapter of the American Nuclear society.

MR. McCREE: In fact, several of our relatively new hires were members of the group that came over and hosted and talked with.

MR. WALLIS: When they actually get hired, that's when you really learn something.

DR. TRAVERS: We have quite a few Georgia Tech on line.

MR. WALLIS: Because students will flirt with all kinds of potential employers but when you actually hire them, that's when you actually learn something.

DR. TRAVERS: In fact, one of them told me, Well, MIT is really the Georgia Tech of the Northeast.

MR. WALLIS: You mean it's been corrupted in the same way.

(General laughter.)

MR. McCREE: One of the strategies that we use, as well, is certainly using our internship and co-op opportunities to get potential new hires onboard so that they can see what we do, whether it's what they want to do, and we certainly have an opportunity as well to see what they're capable of.

And using the co-op strategy, in particular, helps us because it's easier and more efficient for us to hire potential new hires when we bring them in as co-ops and have them here for one or two summers, and we've used that very successfully over the last few years.

MR. McCREE: Next slide, please.

MR. SHEA: Let me take a couple of minutes to talk about the structure to the Inspection Program, and that's the context in which we look to make sure we have the right folks with the right qualifications to successfully accomplish that.

The NRC's entire Operating Reactor Inspection Program is outlined at the highest level in our inspection manual, Chapter 2515, and that outlines the entire Inspection Program: Supplemental, Baseline, Special Inspection programs, and in there indicates that it's imperative that those inspections

be conducted by qualified inspectors and then points to our qualification procedure.

That manual chapter for Operating Reactors is manual Chapter 1245, and that details the levels of qualification, the basic and final qualification, as well as refresher training and continuing education expectations for inspectors.

In the context, all of the training programs are oriented toward establishing really four critical elements that a good inspector needs to have, and that's they understand the legal foundation for acting as an inspector in a regulatory framework, that they have a detailed knowledge of the technology that they're inspecting, and that gets down to whether that's the NSSS specific training or just the generic aspects of pumps and valves or diesel generators and that sort of thing which are generic to the power reactors.

It drives toward making sure the inspectors have good inspection techniques, that is, their ability to gather data, analyze it, and assess it against the regulatory structure, and that's with making sure that they have good ability to assess that in a fundamental safety sense.

And finally, the training program makes

sure that inspectors have what's critical, communication, the ability to communicate what they see in the field to the licensee, back to management, back to headquarters.

MR. WALLIS: Can I ask you about this, you said they learn about the regulatory structure.

MR. SHEA: Yes, sir.

MR. WALLIS: They must be smarter than some of us. Some of us have been on this committee for 10-12 years and we're still trying to figure out some of the details of the regulatory structure. Maybe these guys pick it up quicker. How long does it take for them to really get familiar with the regulatory structure?

MR. SHEA: The expectations for someone who comes in at maybe an early mid-career entry is two years to achieve final qualifications, so they can pick up basic qualifications in 6 to 8 months.

MR. WALLIS: This is a full-time job, so it is taking quite a while.

MR. SHEA: Yes, it does.

MR. POWERS: Based on my observation, it's a grind for two years. They're counting the minutes till the time they get through it. I teach R-800 for this and I get them about a third to two-thirds of the

way through, and they're looking for the end.

MR. WALLIS: Especially your course, I should think.

MR. POWERS: My course is so much fun. Of course, it's rigorous and demanding but it's lots of fun.

(General laughter.)

MR. McCREE: Actually, it's a very sought-after course.

MR. SHEA: But clearly, that's a challenge in part to ensure that it becomes not as much of a grind as it perhaps can be, but we make sure that we're giving them real-time assignments that will give them practical application, even while they're going through the qualification process.

MR. WALLIS: Do you get any attrition? Do they find that after a year that they don't like it?

MR. McCREE: No. The answer is no.

MR. WALLIS: That's a good sign.

MR. McCREE: We haven't lost any during the training process. We've had some leave after -- and these are new hires right out of college -- we've had just a couple leave from this region. I think our attrition rate is less than some of our counterparts in the other regions and headquarters, and I'd like to

attribute that to the fact that most of our new hires have co-op'd with us beforehand, so they have a much better understanding of what they're getting into rather than someone who we just bring in right out of school.

And again, we try not to do that with our new hires. Mid career, it's a little bit different, they're more mature, if you will, more experienced, and have a much better idea of what they're getting into.

MR. POWERS: My observation is that when you pair a new hire with a mentor of some maturity and there's a good working relationship there, it breeds an enthusiasm.

MR. McCREE: Indeed.

MR. POWERS: I can tell who is doing that in the classes I teach because their enthusiasm and curiosity levels are just much, much higher.

MR. McCREE: One of our early lessons learned too -- because most of our new hires are in the Division of Reactor Safety, new hires meaning right out of college -- is that we try not to bring them in one at a time because we want them to have a peer group, if you would.

In fact, early on we called them Pride

Group 1, Pride Group 2 because we bring in several, three or four new hires, and it really helps with their own synergy, at their own level, and it has helped us to retain them and move them along. A couple actually have gone into the Resident Program after about three or four years.

DR. TRAVERS: When we think of attrition, there is one element that we're thinking about currently, and that is some of the new jobs that are likely to be created in headquarters as a function of some of the new work that is being done.

So we're actually incorporating into our philosophy of looking for people for training some notion that we'll probably lose some folks, and that's not just Region II, but the regions collectively will lose some folks as some of those jobs appear to be attractive in our MSS workshops.

MR. LARKINS: Is that a concern? Traditionally the regions have served as the feeder group for a lot of headquarters jobs when they reached the journeyman level, GG-13, 14, as they look for promotions and stuff, and with the challenges you're being confronted with and the need for expertise.

DR. TRAVERS: IT's been more of a challenge in Region I, and as real estate prices go up

in Washington.

(General laughter.)

DR. TRAVERS: But it is.

MR. McCREE: It's happened, I think it's good for the agency to have that movement of operations field experience to headquarters. We're mindful of that and try to plan for it by populating staff with people who can fall in behind them and do what we need to do.

But it is a challenge, and what Bill is alluding to is the fact that the Program Office has allotted us additional FTEs to recognize the likelihood that there will be opportunities

MR. LARKINS: But as you said, as real estate prices get higher, there's less movement.

MR. SIEBER: Washington is a good place to move away from.

DR. TRAVERS: Amen.

(General laughter.)

MR. RANSOM: Do you put the training materials together here? I presume you have training materials that you use. Right?

MR. SHEA: Yes.

MR. RANSOM: I'd personally be interested in getting a copy of that.

MR. SHEA: The training course program is fairly extensive and all oriented toward supporting the qualification of the inspectors. There's classroom training offered both in headquarters and here in the region, and again, some of the attributes about the legal foundation of regulatory structure, the technology and inspector techniques are offered in both places. Part of the qualification process, there's probably 10 to 15 courses that an individual needs to go through, and that material is here and in headquarters.

MR. RANSOM: You haven't put together a text or something with this material?

MR. SHEA: It would not be a single binder, if you will. Some is online, but we can get the representative elements of it.

(General talking.)

MR. McCREE: I think what would be useful is to look at the manual chapter itself, manual chapter 1245 which has several attachments that describe what the qualification program is all about. It tells a person what you have to do to become basic certified and furthermore, what you have to do to complete full qualification.

That's a relatively new development and it

was updated about three years ago, so I think that would be a very useful thing.

MR. WALLIS: So we understand it's tough material, but nobody flunks out, or do some people fail?

MR. McCREE: Well, if that happens, then we have failed.

MR. WALLIS: I presume it's very well, you select them so well.

MR. McCREE: We have had inspectors who have, for example, not passed one of the series courses.

MR. WALLIS: They go back and do it again?

MR. McCREE: What we do is we tutor that individual and send them back and have them do it again, that's correct. And we've had a lot of success with that, the second time around. But we've not had anyone fail to become fully qualified, it just may take a little bit more time.

MR. SHEA: And then the culmination of that final qualification process is the qualification board in which there are seasoned inspectors and management assessing the full range of knowledge of that person before they put him out in the field, so it's that board's responsibility.

MR. WALLIS: I remember about TMI there was some public criticism of the process where people sort of marginally would fail and eventually be reprocessed and marginally get through and so on. I'm sure that is no longer the case?

MR. McCREE: We try to invest on the front-end to make sure that people that we hire are very capable. We've been very fortunate in terms of our new hiring, in terms of grade point average and certainly their college experience, that they're very solid academically. In fact, many of our hires not only have an undergraduate degree but they have a master's degree before coming in.

With respect to our mid-career people, we interview then extensively, do very thorough reference checks, and have been very fortunate in terms of the quality and experience base of folks we've hired.

Again, even in the resident program, within the last five years we've put a major push on because a number of our residents have been hired in headquarters. We've been very successful with hiring individuals that are SRO licensed, shift technical advisors, shift supervisors who are fatigued with working shift work and have always thought about being a regulator, and this is just the right time for them

in their career, and we have a number who are out there in the field right now.

MR. SIEBER: It's been my experience that the key person involved in the training and development of resident inspectors is the senior resident at the plant site.

MR. McCREE: Exactly.

MR. SIEBER: And that performs the check on the quality of the reports that are written and also day-to-day tutoring.

MR. SHEA: That's right, and in fact, once a person receives a basic level of qualification after six months, then they can be assigned to a site, and in that context we would look where are the sites where we have the most seasoned senior residents and look to pair those newer basic-qualified folks with some of those more seasoned folks and get that exchange that way.

MR. SIEBER: I guess the flip side of that is the biggest mistake you can make as managers is to make somebody a senior resident who really doesn't have all these qualities and attributes because some of them are not the kinds of things that you can readily measure.

It has to do with personality, it has to

do with attitude, it has to do with drive, and I have seen a lot of good resident inspectors in my career become so because the senior resident was a very knowledgeable person with a lot of leadership skills.

MR. McCREE: We've tried not to make those kinds of mistakes, and we've had the benefit, we mentioned, of experience level. Each year in NRR sends to the commission a paper called Resident Inspector Demographics, and if you look at that paper, historically Region II has benefitted from having the most experienced inspectors, senior residents as well as residents, in terms of time on a site, past experience in the technical field, whether a shipyard or within the industry.

So we have had that luxury, if you would, of having had experience to pass along to our new resident inspectors.

MR. KRESS: But of your new hires that would like to continue their education, do you have a program, some sort of agreement with Georgia Tech or somewhere that they can go to night school or get off from work?

MR. McCREE: The agency has a program that we benefit from that's called 368 Training that we do take advantage of. What you'll find out in a few

minutes when I show you're the Division of Reactor Safety Skills matrix is while those opportunities are available -- and we have done that, for example, in the digital systems, digital controls, we sent several of our electrical/INC inspectors over to Georgia Tech to get that type of training -- there is, on the other hand, an abundance of training that the NRC offers through our Technical Training Center and the Technical Training Center can contract out for, should there be sufficient interest in that area from all the regions.

MR. KRESS: I had in mind something like a BS engineer wanting to get a master's degree.

MR. McCREE: Right. There are several paths by which a staff member or inspector could pursue that. One would be, as Victor was alluding, sort of on a piece-by-piece approach, course-by-course, you're justifying those courses in the context of their benefit to the agency, but a number of folks have put together advanced degrees through that process.

The other avenue is the agency does have some graduate fellowship program, but those are programs where someone steps out for the period of time, the 18 months or so, to get a degree and then

gets that degree and incurs some obligation to the agency and then comes back in.

MR. SHEA: There is a fellow from Region III, C.J. Farnham, has gone up to MIT to take on graduate studies.

MR. SHACK: I just wanted to ask what number of fellowships do you have per year typically?

MR. McCREE: Right now I think C.J. is the only one, however, we have two current co-ops for whom we are paying their tuition or at least part of their tuition to complete their undergraduate degree. And Joe has a resident inspector out at Harris who is actually completing a master's in nuclear engineering through North Carolina State.

So it is being done, it is quite challenging, though, particularly as a resident, to have time to do that. You're on call 24/365, so it' makes it very challenging. But that is something that we encourage and we support.

MR. DENNING: I don't mean to downplay the importance of the things that you're talking about here and the stimulation of inspectors and their training, but there must also be people that get into this job that really aren't suited for it that are dead wood, and how do you handle that? And I realize

that's a really difficult problem for the agency, but how do you do that, how do you identify them and move them someplace at least where they're not doing harm?

MR. McCREE: Very carefully, very thoughtfully, and certainly using the support and understanding of senior management, as well as the Office of Human Resources and the individual himself. And certainly the regions are isolated in that challenge.

MR. DENNING: Do you have an annual evaluation process that actually works? I mean, does it really work? I've seen lots of them where there's the process but it's done superficially and everybody is afraid to say negative things in these kinds of evaluations.

MR. McCREE: We do have an annual evaluation process and that's certainly a formal process, but it's certainly not the only one that allows a manger, supervisor to engage an employee to put in place resources to enable them to perform better.

We try to hire individuals who have the will, that share our values and certainly have the base level of experience and/or knowledge to help us accomplish our mission. Our job then is to provide

the access to the skills to enable them to do it.

When that doesn't happen, then we have to certainly engage that individual and see what job is best for them, and we do that very thoughtfully and very carefully.

MR. DENNING: Do you look to the utility for comments on the inspectors, or is that inconsistent with regulatory?

MR. McCREE: The answer is yes. This goes back to the early '90s and the Towers Perrin report, where now we formally, as directed by the EDO, when a branch chief or a senior manager engages with a licensee, when we go out for site visits or certainly when they drop in and visit us, one of the specific items that we ask about and we actually document in our trip reports is how our inspectors are performing and if there are any issues that we need to address. So we do get that feedback.

DR. TRAVERS: We try to encourage at every opportunity when management interacts with management, I always ask: Are there any problems; are there any issues you want to raise with me about how you see our oversight program working?

And so I think the best thing you can do is just try to keep those communication lines open.

Sometimes we get some information; sometimes we act on it, sometimes we don't see a need to.

But I think Jack brought up a point earlier that there really is an art, almost, to the way inspectors who are serving this regulatory function interact with licensees. It's acquired, it's not just technical, it's a skill set that takes some time to develop, and in some people it takes a little longer than in others. But in the main, we think we're pretty successful.

MR. SIEBER: Well, I noted when I was working as a licensee that quite often supervision would come and spend a week at our plant sites, basically to monitor what goes on with the site-based personnel which I thought was a good thing.

They would sit in on all the meetings and occasionally I'd be asked what do I think. But licensees are going to be pretty cautious about saying, Well, your resident inspectors are not any good. I don't recall anybody as ever having said that; there may be an instance or two.

DR. TRAVERS: It is occasionally said, we have issues that are raised.

MR. SIEBER: But I would imagine it's pretty rare.

DR. TRAVERS: It's rare, in large measure, I think it's not needed all that often because we have been fairly successful.

MR. SIEBER: I've been flat-out asked by regional administrators what do you think of this person or that person, but the impression that I got, both from outside the agency and inside the agency, is these organizations at the region are basically small enough that the regional administrator and all of the management really know a lot of details about the performance of individuals in that organization. I have always been impressed by that. And I'm sure that this region is the same.

MR. McCREE: And that's not a mistake. I mean, as Bill indicated, people are asked that, certainly the residents and even our base inspectors put a lot of time and energy into their development, their hard technical skills, their soft skills as well that are developed for certainly our seniors, our first-line supervisors. They go through the supervisory courses and that enhances their tool bag as supervisors and their ability to interface with the licensee and certainly senior management in that context.

We reinforce it certainly through the

division directors and the branch chiefs, several of whom spoke with you yesterday, as well as twice a year we have our inspector counterpart meetings involving all the inspectors. So that's another opportunity for Bill, and certainly my colleagues and I reinforce the soft issues, if you would, as well as the important safety issues.

MR. SIEBER: Well, the skill set required for inspectors is quite a bit different than, for example, working in NRR or other places, and if an individual may not be too terrific an inspector, maybe NRR is the place to send them.

MR. SHEA: One last point perhaps on that is that there is an expectation on the first-line supervisors, the branch chiefs who are in the region, that they get out a number of times per year and directly observe the performance of the senior and the residents, both by doing walk-downs of the facility and watching them, observing them doing an inspection, and also attending inspection exit meetings where they can, in the first part, watch their technical inspector skills, on the second forum, watch their communication and ability to communicate regulatory issues directly.

So in addition to the feedback that may or

may not come clearly from the licensee through those other venues, the supervisors first-line and second-line have their own base to make those assessments of performance.

Let me go to the next item and talk about some attributes of succession planning that are unique to the Resident Inspector Program.

The staffing requirements for the resident inspector set out in 1999 established the end policy where at the 18 sites across Region II we have approximately just under 40 resident inspectors out there, depending on the number of reactors at the site.

In terms of succession planning, there's one additional element in the resident program that makes managing succession planning, one element more complicated beyond just managing attrition due to retirements or attrition due to folks making mid-career changes.

The agency's relocation policy established in 1998 SECY paper and carried forth in the field policy manual, establishes that to ensure continuity on one hand and objectivity on the other hand, the resident inspectors can be at the site nominally no more than seven years and typically no less than four

years, with provisions for extraordinary circumstances.

And again, that provides for making sure we have continuity so we're not changing folks out so fast that we can't connect the dots as well, and that they don't stay so long as to lose their objectivity.

So management in the region and the branch chief tracks and projects into the future the expected turnover dates for both the residents and the senior residents, and we can get a sense for what years we're going to have gaps starting to open up that we need to plan for.

One management tool or enhancement that has been made in the recent past is our ability to overlap the assignment of residents and senior residents so that they can get a solid turnover of the issues and performance of that licensee before there's a gap.

And there have been instances where that's caused the agency problems over the past few years, and in response to that we've put in place this ability to double encumber for a period of time the coverage at the site -- I think it's a year for a resident and six months for a senior resident -- and allow, again, for a good turnover.

In the context of looking ahead and projecting when the different sites are going to have openings or change-out of personnel, we can see where we need to keep some surge capacity -- I call it -- in the region of folks who are going through the qualification process, and that is the Resident Inspector Development Program that Vic alluded to earlier.

Currently we have four folks here in the region who are going through their basic qualification program, and that's out of a population of residents of about 40 folks, so that's about a 10 percent surge capacity. And each of those individuals is on a track with expectations about when they're going to timely complete their qualifications and are doing well in terms of keeping to that expectation. In fact, we're getting ready to hire on a fifth person into that program to keep that surge capacity.

MR. WALLIS: So you have 40 out there and the average resident's time is five or six years, then you're going to have to need eight a year to replace them or something?

MR. KRESS: They go someplace else.

(General talking.)

MR. WALLIS: They just keep rotating them

around? I see what you mean, they don't go somewhere else, they just go from plant to plant.

MR. SHACK: Can they actually return to a plant after some time?

MR. McCREE: If I could?

MR. SHEA: Sure.

MR. McCREE: With respect to surge capacity, that is, if you would, a nominal surge capacity in the Division of Reactor Projects. There are also inspectors in the Division of Reactor Safety who certainly are capable and have interest occasionally in being residents as well. So there are actually several that we know of who would like to, at some point, become a resident. And in fact, each of them are fully qualified, so there's actually more.

MR. WALLIS: It's sort of a strategic reserve.

MR. McCREE: It's a strategic reserve. I'll have to write that one down.

To answer your question, there is no agency policy that would preclude a resident from returning at some subsequent point to serve as a resident or even as a senior at the same site.

We have had sub-optimal experiences when we have done that. We have a senior who was once the

project manager at Browns Ferry, and in fact, his predecessor was employed at TVA at Browns Ferry 17 years before we assigned him. But that's the exception rather than the rule.

We generally do not do that simply because of the perception by the licensee that that individual may not be open, and even when we had some inspectors who have been employed by a licensee, we will consciously try not to send that individual or assign that individual to that site to avoid that same perception and questions about objectivity.

MR. SIEBER: I thought that was a hard and fast rule.

MR. McCREE: Again, that's not a written policy, it's not an institutional policy, but it's one that we try to keep in mind.

DR. TRAVERS: But you're correct, very often what happens when people move is they move to another site, especially a resident inspector may move up to become senior, for example, at another site.

MR. SIEBER: On the other hand, again as a licensee, there were instances where I would have liked to have hired my staff, NRC personnel, and of course, the ethics issue would prevent me from doing that with anybody having anything to do with our

plant, but I could have hired from somebody else's plant.

MR. McCREE: And it's becoming our internal policy not to assign a resident to a licensee, not just to a site but to a licensee for which he or she has served as a resident before. It could become an even greater challenge as licensees combine across regions, and we're aware of that and our policy will have to be reformed by those changes as they occur.

But we've found that policy useful, it's helped us in terms of our personnel assignment

MR. SIEBER: Now, there used to be a rotation policy of five years which was, to my knowledge, never rigorously enforced just because of the difficulty of playing checkers with few checkers on a big board.

MR. SHEA: As I was referring to, it has been revised, it's now actually a seven-year stay time. In fact, the two I was referring to, here's how we track -- this is for senior residents -- who is current at the site and the little red circle shows when their seven-year period would expire, and the X reminds us when we would want to think about advertising that upcoming vacancy and make sure we do

that in a timely way so we can get the overlap and the good turnover.

MR. McCREE: Just to reiterate, that is rigorously enforced. It's in the EDO's policy field manual. In fact, Bill has to request permission from the EDO to extend it beyond that date.

DR. TRAVERS: I don't think we've done it.

MR. WALLIS: You might want to level this out a bit. I notice you have no hires in some years and you have a huge number -- or no moves in some years and then a huge number in other years. You might want to level it off so there's about the same changeover each year or something. Just a comment.

MR. McCREE: This slide here again shows the senior residents, and there are a couple of assumptions -- and again, this is just a tool, there's no magic in this other than experience, logic and reason -- but one assumption is that the seniors would remain at the site until the end of their tour, seven years, which based on our experience, that's rare.

As Joe mentioned by policy, we have to leave them there for four years unless we get Bill's permission, and again, he has to request the EDO's approval.

DR. TRAVERS: Sometimes it's just money.

MR. McCREE: It is, it's the cost of relocation. I think it's about $100,000 per move, and those costs are excessive and we've received guidance. In fact, those waivers that Bill could previously request would not likely be approved unless there's some extraordinary reason.

MR. SIEBER: One practice that you had, and I think you still have, that I think is a really good practice is take a resident from one plant and assign him as a transient inspector to another plant with perhaps similar issues.

DR. TRAVERS: We do that very often with special inspectors, for example. Even in Region III, for example, where David Specie or D.C. Cook has been, we can very often provide team members to some of the team inspections they carry out.

And where people go on vacation, we very often send senior or resident inspectors to those other sites, and in a developmental sense, we're looking for opportunities to broaden the perspective to people to bring in their own jobs.

MR. SIEBER: Among licensees, one of the things that developed a complacency in the organization was a lack of communication in this broad breadth of knowledge of what the industry was doing.

You have the potential in the agency to have the same thing occur, and these kinds of thins are efforts that will prevent it or forestall a sense of complacency that develops because the scope is too narrow. So I encourage that.

DR. TRAVERS: I think that's a very good point and in an era where the nuclear industry is performing sort of relatively well -- especially in comparison to 12-15 years ago -- that guarding against complacency, both within the industry and within NRC, is a very, very key element of what we need to guard against.

MR. SIEBER: Well, the kind of policies that you're talking about and that you employ are the kinds of things that I think help the agency avoid those situations, so that's good.

DR. TRAVERS: And I mentioned good performance. If you look at the Southeast, in particular, the performance of the nuclear industry in the Southeast and the potential for that sort of complacency to take over is quite good. So we certainly recognize your point, it's a good one.

MR. SHEA: The point about the distribution of rotation times, on that same tool, this reflects the projections for the resident

inspectors, and you can see that unlike the seniors where it was a little sort of weighted out there in the 2009-10 time frame, the resident inspector rotation distribution is a little more balanced.

Some of those folks would go to other sites as their times came up, some of them as senior resident or even headquarters positions came open would be looking to move into those kind of positions.

MR. McCREE: So just from an overview, the surge capacity that Joe spoke to within the region is a typical source of new residents to replace the incumbents, and for the most part, the residents within Region II, and in fact, the entire population of the nation of residents, because when a senior resident inspector position is posted, it's posted nationwide.

So we have potential incumbents among residents within Region II as well as in other regions, or perhaps even headquarters that there may be some residents who have gone there to gather additional experience and then they come back to the region as a senior resident. And that's always helpful for us to get cross-pollination among the regions and headquarters.

MR. THADANI: Just a quick question, Joe.

Changing the five-year to seven-year policy, I assume that would lead to improved morale and so on. Is that the case?

MR. McCREE: That is my perception, that's been my experience from speaking to the residents and the seniors is that it's helped them to plan their lives better, and we've also been able to assure their objectivity through other means. And one of the requirements that we lay upon inspectors every year is that they do an objectivity visit at another site for at least a week, and that's helped us to, again, promote their objectivity, as well as visits by our branch chiefs. But that seven years has been a help.

MR. THADANI: Is there any study that says seven years is good, nine years is not good?

MR. McCREE: There's nothing scientific about that.

MR. SHEA: And in the end, any relocation is going to have its challenge for the individual, so seven years or eight years.

MR. McCREE: But it's a nice round number.

MR. SHEA: The last piece I was going to mention -- but may in the discussion on DRS show it in a little bit more detail -- is that in the continuing development of our inspectors we have a similar web-

based tool where we track the experiences that the inspectors have, both their prior experience, their internal developmental activities, the classroom and academic training they've had, and from that we attempt to make sure that as we're planning training activities and training opportunities for the whole inspector corps, make sure that we continue to get a good distribution of all those four basic skills that I talked about at the beginning.

In the interest of time, perhaps we can look at that tool in the next part of the discussion.

MR. McCREE: That's the one I'm about to speak to.

I think Yogi Bear once said, You've got to be careful if you don't know where you're going because you might not get there.

Several years ago -- it's been recognized for more than several, about five years ago, and this has been updated certainly since that time -- recognized that we have a significant succession plan challenge because of our aging workforce and other factors.

So we laid out what we thought was a logical tool that would identify the skills that we need, and from that, to complete our tasks.

MR. WALLIS: So these needs in this column are the needs above what you have now? Because otherwise you might conclude that you have ten people and you only need two. What you mean is you have ten people and you need two more.

MR. McCREE: Understand. These are the needs that we need right now.

MR. WALLIS: So you have ten people and you only need two of them? Is that what I understand?

MR. McCREE: Let me start in the left-most column. The skills needed are the skills that we need right now to implement the Baseline Inspection Program.

MR. WALLIS: So in all columns you have more people than you need?

MR. SIEBER: No. Physical security has fewer qualified people.

MR. WALLIS: Yes, but in most of them the staff onboard is bigger than the need so you could do away with a lot of these people?

MR. SIEBER: No. Some people have more than one skill.

MR. McCREE: Let me use an example. Under structural engineering, the first area, the staff needed to complete integrated leak rate response

testing, the staff needed is one and we have four onboard who are capable of doing that.

MR. WALLIS: Okay, but they're doing other things too.

MR. McCREE: They're doing other things as well. So we have more than enough.

MR. SIEBER: Well, this doesn't explain whether you have enough people to do all the work, this tells you whether you have enough skills to do individual jobs.

MR. McCREE: Correct.

MR. SIEBER: The more interesting question is do you have enough overall people with the right skills to do all the work that has to be done. And that's a different answer than this chart will show you.

MR. McCREE: That's correct. What this does do for us, however, is identify skills gaps. In other words, the delta between what we have and what we need or what we project we will need because of anticipated losses, for example, due to primarily retirement.

DR. TRAVERS: Or new programs like construction inspection.

MR. McCREE: Yes.

MR. SIEBER: Or physical security where you do have a shortfall.

MR. McCREE: Right.

MR. THADANI: I'm a little bit surprised, why is that a special skill, integrated leak rate response testing?

MR. POWERS: What do you mean, it's the hardest test I can think of doing. It's unbelievable difficult and nobody has done it for ten years.

(General talking.)

MR. THADANI: But is that a special skill?

MR. McCREE: It is an activity, it is a line item inspection requirement. Not every mechanical or structural inspector can do it by virtue of just being a mechanical or structural, it takes experience.

DR. TRAVERS: We just want to make sure we're tracking the capacity to be able to have the right people and skill to do that.

MR. POWERS: It's an incredibly difficult test to do because just the day-to-day variations is bigger than the leak that you're trying to detect.

MR. WALLIS: I think it's just words. This is really a task, isn't it; these are task areas rather than what you might think of as skills. It

doesn't matter, though, I understand what you mean.

MR. CARUSO: The staff need, though, that's not an FTE number, that's a bodies number.

MR. McCREE: Correct, exactly.

MR. CARUSO: I mean, if you add that number of staff needs up, you don't come to the same FTE as you have onboard.

MR. SIEBER: No, you don't.

MR. McCREE: I've not done that, but if it weren't I the ballpark, I'd question the adequacy of our FTEs. In fact, you won't see a total number at the end because we haven't thought of it that way, but you ask an interesting question.

MR. POWERS: On this integrated leak rate test, we are coming up on the ten-year anniversary of the revised Appendix J so there must be some that are coming down the line. Do you know when we scheduling to do these things?

MR. McCREE: We could probably change the schedule.

MR. POWERS: It would be interesting to witness one of them because they're incredibly difficult to do.

MR. THADANI: You could also go to other regions if necessary for stuff like that.

MR. POWERS: The agency may want to get a specialist in there to do those things.

MR. McCREE: Another example I'll point out to you, primarily because he's here, under metallurgical engineering, the staff needs are four, staff onboard is four. However, under 2005 as well as 2006, 2007, you'll notice EM&L which stands for early career, mid career and late career.

Again, this was a tool primarily driven by our anticipated loss due to retirement. The fact that one of our metallurgical engineers in that are, if you would, discipline, is in the late career, we identified the need to hire a mid-career in-service inspection engineer, and he just happens to be here right now, has a good bit of industry experience from PSE&G.

So that's one example of we use this to inform what our needs out, and we went out and got him, so when we update this in a few weeks, we'll be able to remove that. And there are other similar examples. This is a dynamic tool that we use.

For example, on the next page under mechanical engineer, there's a clear abundance, if you would, of mechanical engineers but we did identify under projected new hires to transfer an early-career

from NRR.

We found out last week that that individual has decided not to come which is good for him because an opportunity is available for him at NRR, and actually good for us too because our assessment in the electrical engineering area has determined that we really need a mid career electrical engineer. So we can use that FTE for that purpose.

So this a tool, DRP has an analogous one, that we use to identify our needs.

And one additional thing that this shows on the far right column you'll see succession action plan and most of what's in there is the training courses that we are specifically targeting to our staff to develop, expand or hone skills that we know we're going to need, particularly among our new hires. You'll see EC, early career, those are training courses for early career.

And the vast majority of our training budget -- we'll have a Training Committee meeting next week, a senior management Training Committee meeting -- the vast majority of our training budget goes to the Division of Reactor Safety, I think about two-thirds, because the DRS staff are recognized as the experts in a number of technical areas so we

leverage our training budget to reflect that.

Go back to the power point slide, please. In closing on this slide, there are 17 areas here that we focus on, and we're in the process of enriching this, if you would, to address our needs in the anticipated construction inspection program area. It's a very dynamic area for us and there are some needs that we need to refresh with this.

Next slide. I have several slides here really just for your information that provide demographic data, if you would, on Region II staff.

An earlier question was asked about graduate training. We do have a number of employees that hold master's degrees, five who have doctorate degrees. What's not shown on here, and I'll enhance it next time, is the number of professional engineer licensees or EIT holders that we have. We do have quite a few of those, so I apologize for not reflecting that. We do have our one regional counsel too -- we only need one.

MR. WALLIS: The next one is interesting. Do you actually hire in at age 40? Otherwise you have a strange population distribution for whenever you say sustain ability, let's say.

MR. McCREE: Well, certainly to satisfy

EEOC laws, we cannot exclude individuals over 40.

MR. WALLIS: Well, if they just move through, you're going to have a real punch in ten years.

MR. McCREE: Right. What we have done -- and I can say this -- we have targeted at the entire agency new hires to address our age distribution challenge, and we've been very successful.

DR. TRAVERS: Twenty-five percent target for new hires. And again, we're not talking age, we're talking experience level as a function. But it certainly recognizes this issue that the agency has -- some would call it the perfect storm of things -- you've got a profile that looks like this in tandem with some of these new projects that are developing, and if you look at both of those factors, it becomes a very difficult situation.

MR. McCREE: Next slide, please. It's another complementary slide that talks about years of federal service, and again, this reflects on the far left our success in the last few years on our new hires in terms of staff with less than ten years experience. We've been very aggressive and very successful in that regard.

Next slide. I included this one -- in

fact, I just updated it this morning so it's not reflected in the slide that you have there -- to show the ongoing challenge we have in retirement eligibility and our need to definitely focus on succession planning.

There was a dip in optional retirement eligibility in '06, we did have several people retire, some moved to headquarters, but there is an increasing trend in increasing age in our workforce.

MR. THADANI: In '04, 60 people did take early retirement?

MR. McCREE: No. What that reflects is eligibility for.

MR. THADANI: So that's not real.

MR. McCREE: No. It's just eligibility

MR. WALLIS: How many total employees are there then, because if I look at these other pages, I see the total number of employees is 200 or something?

MR. McCREE: Correct, 212.

MR. WALLIS: So you have a huge number ready for early retirement.

MR. McCREE: Correct. That's the insight that I wanted to share with you.

DR. TRAVERS: And one element of that is that it's disproportional in certain areas, so it

becomes even more problematic in certain key areas. That's why we want to be as knowledgeable as we can to manage it.

MR. DENNING: I wonder if I could talk a little bit about fire protection engineer. I notice as far as the skill set going back there that there were identified as five fire protection, and are those truly fire protection engineers, people with just fire protection skills?

MR. McCREE: We have one licensed, I guess, if you would, fire protection engineer, we have several individuals with electrical or mechanical background who have developed expertise, if you would, in fire protection -- one of whom is sitting in the back there, and they lead our fire protection inspections.

On the other hand, we do have two co-ops who are -- in fact one will join us next spring who will have a degree in fire protection engineering, and the other one next fall. So indeed, they are knowledgeable in fire protection engineering.

MR. DENNING: When you're inspecting a site, to what extent do you rely on the resident inspector to check on the fire protection elements, or are there groups of fire protection engineers that go

around and do this? How do you actually do that?

MR. McCREE: That's a very good question. The Baseline Inspection Program, there's an inspection procedure for fire protection inspection, and there are two attachments.

One is a quarterly inspection requirement that the resident inspectors implement that's primarily focused on the performance of inspecting the plant for transient combustibles, for example, inspecting the licensee's fire drills, or if there's an actual fire, to observe the licensee's performance. That's the function of the resident inspectors.

And then we have what's called the triennial fire protection inspection which, again, Bob Schin and Charlie Payne will speak to later this afternoon, will talk about the triennial fire protection inspection which is a team inspection composed of at least four individuals and perhaps a contractor, and that's an integrated examination of the licensee's fire protection program.

MR. DENNING: If we move to risk informed performance based fire protection, what we've been told is that the inspectors will be able to go in and look at things and review what the licensee has done in terms of like fire propagation with computer codes

and associated circuits kinds of analyses, things that would really require a great deal of in-depth knowledge. Are those things practical for inspectors to do?

MR. McCREE: May I ask that you hold that? Well, the answer is yes. We do rely on contractor support for some of the more complex issues, but we have developed, through training, a very sound body of expertise, I believe, by comparison to some of our counterparts in the other regions, probably almost a center of excellence in terms of the quality of our fire protection inspectors.

Again, when Charlie Payne and perhaps Bob, you may want to sit here along with them in a couple of hours to talk about that. I'd ask that you reiterate that question to them.

MR. SCHIN: It's a good question. It's a problem that we're facing, how we're going to do that.

MR. McCREE: Can you go back to that last slide? This is just a demographic slide that shows agency-wide the ongoing challenge. This is an age distribution chart that shows the green-colored area is what the agency-wide age distribution was in 2000, September of 2000, and the blue is the shift that's occurred as of April of this year.

MR. SIEBER: Everybody got older.

MR. McCREE: The way I like to look at it is much more experienced.

(General laughter.)

MR. McCREE: It just, again, underscores the challenge that faces us right now in terms of our hiring strategy and succession planning. And of course, one of the real factors that we have to deal with here in Region II and in headquarters and other places is we would love to bring aboard to learn from our sage inspectors, to gather that knowledge and hit the deck running, so to speak but we're constrained by office space, so we're having to manage this very, very closely.

MR. SIEBER: Thank you. Any questions? If not, we are to the point of a break, and I think if we would come back at ten o'clock by that clock, that would keep us within striking distance of the schedule.

(Whereupon, a brief recess was taken.)

MR. SIEBER: We're ready now to resume.

MR. SCHIN: Good morning. I'm Bob Schin, senior reactor inspector in Engineering Branch 2 in the Division of Reactor Safety. I've been an inspector with the NRC in Atlanta for 18 years, and

primarily covering plant operations and engineering type areas.

Next slide, please. The purpose of this section of the discussion is to discuss certain white findings, and in particular the recent inspection that we had for a degraded mitigating system cornerstone at Oconee.

This inspection was performed using the inspection procedure 95002 for degraded cornerstone two white findings and during May to June of this year.

Next slide, please. The focus of the inspection, as described in the inspection procedure, is to provide assurance that for the two white findings the root causes were understood and corrective actions were adequate. Also, to independently assess the extent of condition and the extent of cause.

The two white findings, I'll give a little description of what they were. First, there was a 3rd quarter 2003 finding involving inadequate standby shutdown facility pressurizer heater capacity. That's the pressurizer heaters that were powered from the SSF. And this finding had been closed by a previous 95002 inspection that was six months prior to this

one.

And the second white finding was the 3rd quarter 2004 finding involving inadequate procedural criteria for manning the SSF during a fire. So both of these findings in part involved the SSF.

Now, to give a little technical description of what were the issues. First, the SSF pressurizer heater finding, this issue was licensee-identified during testing development on March 7, 2002. They discovered that they had an insufficient capacity of the pressurizer heaters that were powered by the SSF to assure natural circulation cooling.

What happens is if you don't maintain enough temperature in the pressurizer, then the pressurizer cools down, you lose RCS pressure, and you lose sub-cooling margin.

The way the BMW plants are designed, the hot leg goes into a candy cane which is a high part above the steam generator, and you have flow through the steam generator. The high part there is a hot part and it's subject to voiding, and then once you get voiding, you lose your natural circulation.

They discovered that the pressurizer ambient heat losses were in the range of 143 to 178 kW for each of the units, and that greatly exceeded the

70 kW that was in the original design basis documents.

What happened is that the original design analysis for 70 kW was wrong, the heat loss was really more, and then over the years the amount of heat loss got worse because of poor maintenance of the insulation on the pressurizer, et cetera. So at this point they were greatly exceeding the 70 kW from the original design basis documents and the heat loss exceeded the kW for the pressurizer heaters that were powered by the SSF.

MR. WALLIS: So how do you have the insulation degenerate?

MR. SCHIN: Maintenance, they will take it off, put it back on.

MR. WALLIS: They don't put it on properly? It doesn't deteriorate, does it?

MR. SCHIN: It gets beat up. Pieces might be missing.

MR. WALLIS: They take it off and bits of it fall off. Okay.

MR. DENNING: It gets beaten up and doesn't work very well. The other kind doesn't get beaten up and it works well, this is why people like it, but metallic particularly.

MR. SIEBER: There are a lot of reasons

why they like the metallic. I take it the operators were able to tell by how many they would ordinarily have to put in service during a heat-up, that there was a discrepancy between the 70?

MR. SCHIN: Right. Prior to this 2002, there was a case when they lost power to the normal pressurize heaters and power from the SSF and discovered they couldn't maintain pressure.

Now, at that time, though, they had reactor coolant pumps running and so the thought was that the spray valve was leaking by and that was affecting it, and they didn't recognize the extent of the problem right off the bat.

Normally when the SSF is powering the heater, when you're relying on the SSF, you don't have reactor coolant pumps running at the same time, so you don't have any spray.

MR. THADANI: Didn't they find at the Three Mile Island accident that for the high points they had to have some vent capability to promote natural circulation? Does Oconee not have that?

MR. SIEBER: They have it. It's supposed to work without only second level safeguards. If you have to get into venting because of design deficiencies in the basic design, then the design

basis is invalid.

MR. SCHIN: Right. The procedures are not set up to rely on venting of that candy cane. Not for operation of the SSF, no, they don't rely on that.

MR. DENNING: Now, when you talk about SSF powering, you mean that there's a control capability only for certain of the electrical heaters from the SSF?

MR. SCHIN: Right, from the SSF. You can switch over the power; certain heaters can be powered either from the SSF or from the normal power supply.

MR. DENNING: When you say powered, do you mean control? SSF isn't the power source, is just is a control capability?

MR. SCHIN: No. It is a power source. When the plant is normally operating there's power from the normal 4160-4 kV switch gear out in the turbine building, there's some power that goes over to the SSF and normally powers the SSF. But when you're relying on the SSF in emergency conditions, it can either use that power which is not well protected, it's not safety grade power, or you can use the SSF diesel generator to generate power and power the SSF and power these heaters. That's the design capability. So the SSF does generate its own

electricity.

MR. SIEBER: On the other hand, if you require more power than 70 kW, the SSF diesel may not be able to provide that plus everything else.

MR. SCHIN: Well, it's probably could, it's a large diesel, I think somewhere around 3,000 kW. It's like a normal emergency diesel that other power plants have.

MR. SIEBER: But that's not part of the design basis.

MR. SCHIN: But the wiring is not such that the SSF diesel can power the other heaters, it's not wired up to be able to do that.

MR. SCHIN: So anyway, this was considered to be an inadequate corrective action violation because the licensee had numerous prior opportunities to identify it. It was not considered to be an old design issue.

Any more questions about that?

MR. DENNING: The words inadequate corrective action, is that what you would call the root cause?

MR. SCHIN: That was the violation that was cited by the NRC.

MR. DENNING: That's not a root cause.

MR. SCHIN: No, that's not the root cause. The root cause would have been the original design analysis was incorrect, the testing was not adequate to pick this up. There were opportunities when the operator should have noticed how many heaters, that they were having to use more than the normal amount of heaters to maintain pressurizer temperature, that type of thing.

But there may have been multiple problems. They had a problem with the spray valve leaking and that masked it to some extent.

MR. BUNACA: Well, that may have misled them.

MR. SCHIN: Right.

MR. BUNACA: When you say that there were several opportunities to identify, this was prior to March 2002, I guess.

MR. SCHIN: That's true, yes, sir.

MR. SIEBER: From day one.

MR. SCHIN: Right.

MR. BUNACA: I'm just asking because the finding was it the 3rd quarter of 2003, so a year and a half later you cite this finding, but actually the finding that you have in 2003 is for this event in March 2002.

MR. SCHIN: I'm not sure about the timing of when we count findings against the action matrix. It's not just when the licensee may have had an inkling of a problem.

MR. WALLIS: It's an interesting situation. I think we have other ones like this where a thing has been going on for a very long time.

MR. SCHIN: Right.

MR. WALLIS: And then the licensee eventually wakes up and says oh, we found this problem, and so you penalize them, so there's no incentive to find the problem.

MR. SCHIN: Right.

MR. WALLIS: It's kind of counter-intuitive, really. There ought to be some reward for at least recognizing the problem.

MR. SIEBER: The reward is there was no civil penalty.

MR. WALLIS: If they'd waited even longer, there would have been more penalty?

MR. SHACK: If somebody else had found it instead of them, they would have been hammered.

MR. SIEBER: It's the number of lashes. You get reduced lashes, reduced strength and number.

MR. SCHIN: The second white finding that

we were looking at was manning the SSF during a fire, and this finding was NRC-identified during a triennial fire protection inspection in February of 2002.

And in this case the procedures for staffing the SSF during a fire did not send operators to the SSF until after fire damage had caused a loss of function of steam generator feed water or high pressure injection.

So they had already sustained considerable damage due to the fire, and consequently, the pressurizer relief valves could lift many times and potentially fail open, rendering the SSF inoperable.

So the citation was for failure to meet the fire protection licensing basis for properly staffing the SSF during a fire before the fire damages the cables.

MR. WALLIS: Now, it becomes inoperable because it can't function anymore or because there's no access to it, or why is it inoperable?

MR. SCHIN: If you don't staff the SSF in time till after these various things fail -- for example, if you wait till after you have a loss of all feed water, what happens in a BMW plant when you lose all feed water to the steam generators -- they have small steam generators and within about seven minutes

the steam generators go dry.

MR. THADANI: This is a TMI situation.

MR. SCHIN: Exactly. And then the RCS pressure jumps right up to the relief valve set point and you start popping the relief valve. And then within 16 minutes from popping the relief valve, the RCS is heating up and the bubble shifts on the pressurizer over into the reactor vessel.

And so the problem is with delayed staffing of the SSF, now you've got some repeated popping of this relief valve for a number of minutes, and that increases the risk of failure of the relief valve. If the relief valve fails open, now the SSF won't work. It only has a small reactor coolant system makeup pump that pumps about 30 gallons per minute, and it can't handle any kind of leakage.

MR. WALLIS: It doesn't have the pressure?

MR. SCHIN: It does have the pressure, it's a positive displacement pump, but it doesn't have the volume.

MR. SIEBER: So this would have been TMI all over again.

MR. SCHIN: Could have -- right. Stuck-open PORV and no --

MR. DENNING: Main control room assumed

inoperable. Main control room is assumed uninhabitable.

MR. SCHIN: This is during an Appendix R analysis where you lose control of enough equipment that by the design, the safe shutdown analysis, they should be staffing the SSF.

The idea, and in fact, specific in the licensing basis was that they would send someone to the SSF -- the licensee made a commitment in a letter to the NRC that they would send someone to the SSF, when they had a fire in certain areas they would send someone promptly to the SSF to be standing by such that if you did lose control, had certain fire damage and lost all feed water to the steam generators, the individual would be at the SSF to promptly transfer control such that your relief valves are not going to be popping open multiple times.

MR. DENNING: Is that an action that you cannot perform from the main control room, or is it assumed that in this fire you lost the main control room?

MR. SCHIN: From the main control room you've either -- the problem comes in where the people are still in the main control room, it's habitable, but you've lost control of the plant because of fire

damage to control cables for various valves and pumps. So that the control room, you've lost either all feed water, main feed water and auxiliary feed water, or you've lost all high pressure injection capability.

Part of the problem is the SSF is designed such that when you go to the SSF to activate it, the first thing you do is transfer control to the SSF. It's like an auxiliary shutdown panel on the other plants, you have all these transfer switches.

And when you transfer control, now those valves and pumps are powered from the SSF and all the cables out in the plant that are subject to fire damage now are out of the picture.

But while they're in the picture before you throw those transfer switches, you could have spurious actuations of valves and potentially cause more damage. In other words, you don't want to wait till after you've had fire damage to the cables and spurious actuations until you throw the transfer switch because by then it might be too late.

MR. WALLIS: So why is it only a white finding?

MR. SCHIN: It was only a white finding because our significance determination process came out that way, and it depends largely on the initiating

event frequency.

MR. WALLIS: Because it's so unlikely.

MR. SCHIN: Exactly. An initiating event frequency.

MR. WALLIS: Because it sounds pretty bad, the scenario you've described.

MR. THADANI: I think what you described, to me, is very reasonable way to deal with this issue, but does Appendix R allow you to also assume that relief valve is stuck open or are you postulating certain shorts that create that condition, and if so, then why wait?

MR. SCHIN: No, Appendix R is a deterministic design criteria.

MR. THADANI: Right, and that's why I don't know if you can postulate.

MR. SCHIN: The way our process works, first you have to have a finding where the licensee did something that was contrary to the licensing basis in this case. The licensing basis was that they send someone to the SSF immediately. They didn't do that, they were going to wait till after they had all this fire damage. So that's the finding.

Now, when we look at risk, now we can consider the likelihood of a valve sticking open.

MR. WALLIS: So they can be lax if they think that it's not risky? They didn't do what they were supposed to do.

DR. TRAVERS: They have to fix that. We're only talking about the classification of the finding as a function of risk and the initiating event probability associated with it.

MR. WALLIS: But it's interesting, they obviously were not in compliance, they didn't do what they should have done, but you said well it's okay because it wasn't so risky.

(General talking.)

MR. SIEBER: I'm with you, I'm a deterministic kind of person.

MR. WALLIS: You're a very bad boy but the risk wasn't so bad so it's okay.

MR. SIEBER: I would skip that last part.

MR. BUNACA: One aggravating circumstance, of course, is the fact that they did not identify this, you found it.

MR. SCHIN: Right.

MR. BUNACA: I mean, do you account for it when you make a determination of a white is it purely based on the significant determination on a risk basis, or do you have consideration of who identified

this problem?

MR. SCHIN: No. And the risk only considers if the issue had been -- the condition had been in place for various time periods, up to three days or up to 30 days or up to a year. If it had been in place for 10 or 20 years, that doesn't change the risk from the NRC's analysis.

MR. WALLIS: But it obviously does. If you multiply the risk per year by number of years, it was a bigger hazard.

MR. SCHIN: Right, but our process doesn't do that, we stop at one year.

MR. BUNACA: Now, if you had a number of findings, different findings, and was consistently the NRC is the one identifying these technical deficiencies, how would you handle it within the ROP? Does it become a cross-carrying issue? I'm not sure about that. Maybe it would be.

MR. SCHIN: Possibly. It has to do with how we document things and whether they could be cross-cutting issues, but basically we have this action matrix that once we identify something as say a white finding, it goes on the action matrix and it's on there for so long, for let's say a year, and it will drop off if it's been corrected and we've

inspected and verified that the situation has been corrected. So it could stay on for longer than a year.

And then if there's any other issues that come on the action matrix that are say white findings in the mitigating system cornerstone that are on during the same quarter, then that makes two that are on the action matrix at the same time and we have a 95002 inspection.

We've had a number of these at Oconee during the last few years.

MR. BUNACA: I mean, that says something, and I'm sure ROP really deals with it. I'm sure you have ways of dealing at some point with it, that's what I was looking for. I mean, it's like treatment of repeat events where you have an issue, supposed to be corrected, the correction is not adequate, so you have a repeat event again. Those are aggravating factors which are important, may be cultural issues.

MR. SCHIN: Right. Now, when we get involved, though, we identify what the finding is and they have to implement some corrective action. And then we go back for issues that are white or more, we have a follow-up inspection, and it's either a 95001 or 95002 inspection, and we look at what their planned

corrective action is and does it address the issue and the causes for the issue, and then we determine if that's adequate and we close the finding. And then the white goes off the action matrix.

But now, that doesn't prevent having some other issue two months later that's another white finding that may be in some different piece of equipment or different cause.

MR. SIEBER: Well, both of these are in the same cornerstone which is mitigating system, so it's not multiple degraded cornerstones. And you look for cross-cutting issues if the root cause for multiple degraded cornerstones is the same. And so this doesn't appear to fit into that.

DR. TRAVERS: You can get into trouble by multiple or repetitive.

MR. DENNING: What is the root cause here? On this one, what do you consider the root cause to be? Was it in the Appendix R analysis?

MR. SCHIN: The licensee did a root cause analysis and we reviewed that, and they determined that the root cause was multiple and it was because back during the early 1980s when this Appendix R rule came out and they installed the SSF and they had first procedures for the SSF, that the operators who wrote

up the first procedures incorrectly interpreted the licensing basis.

MR. WALLIS: So it's a procedures problem.

MR. SCHIN: Right.

MR. WALLIS: Because your description said they didn't send anybody to the SSF, but the procedures didn't ask them to do that.

MR. SCHIN: Right. But they had the whole licensing basis and the letters at the time, and they understood that there was what was called a ten-minute rule for the SSF, that if you lost all of the feed water function or all of the high pressure injection function that you had to man the SSF within ten minutes and get it in operation.

Then the fire protection rules came out and for manning the SSF in the event of a fire, they apparently incorrectly assumed that that was the only ten-minute window. But the description in the letter to the NRC said that one of the concerns was hot shorts and spurious actuations during a fire, and so that they would man the SSF or send someone to the SSF within ten minutes of the start of the fire so that the person would be there before the hot shorts would occur. But if there were hot shorts and spurious actuations that occurred, there would be someone

already at the SSF.

But the operators misinterpreted that and they didn't understand apparently that quote, ten-minute window from the start of the fire to get to the SSF within ten minutes or promptly, and they just considered there was one ten-minute window.

MR. DENNING: And then to transfer to the SSF?

MR. SCHIN: The licensing basis was just that you have someone there promptly from the start of a fire

Now, the licensee's root cause said that there were people at the general office -- most of their engineering in those days was at the general office, not at the plant, so their engineers were in Charlotte and the people at the plant were in South Carolina.

But the electrical engineers at the general office understood what the problem was but they didn't communicate with the people at the plant, the operators. The operators who were writing the procedure apparently went on their own and their root cause was they didn't understand.

What they said was that during the course of many years since that happened, there were multiple

missed opportunities to identify this, when they did their own different inspections, other various NRC inspections, audits. And this issue of timing the staffing of the SSF was questioned on many different occasions, at least half a dozen. And they had some programmatic breakdown as to why it was not picked up on half a dozen different occasions since the early '80s when the problem originally happened.

MR. WALLIS: Is this the only BMW plant you have in this region?

MR. SCHIN: No. We have Crystal River too.

MR. WALLIS: Is the other one doing it right?

MR. SCHIN: Yes, as far as we know. Well, they don't have an SSF, so they have to staff their auxiliary shutdown panel at some point. And to be honest, that's an areas that we're looking at, the timing of staffing the early shutdown panel and could there be other problems with that, maybe there could. We're looking at that in fire protection inspections.

MR. CARUSO: When you looked at the risk for these two issues, not manning the SSF, but manning the SSF and he pressurizer, did you consider because they both related to the same starting scenario

synergistic effects between them in determining risk?

MR. SCHIN: Right, we did that. Bob, our senior risk analyst, looked at that and the risk of each one of these and how they would add together, and considered that to correctly assess the risk of both of these being in place at the same time, you would directly add the risk of each one, and it still came out white. It was a high white but it didn't go into the yellow column.

And he evaluated why that was appropriate, and it was because the one issue the concern was an early failure of the pressurizer or safety valve early in the scenario, and the other one, the concern was later in the scenario. The timing wasn't at the same time.

MR. McCREE: Just so that you know the depth of the risk reviews of STPs, when we have a potentially greater than green finding, the SRAs routinely share their analyses with the support risk group at NRR as well as research. And part of that process called the Significance in Enforcement Review Panel, the SERP, focuses primarily the risk analyses. This was a collegial conclusion we reached on the significance of this.

MR. SIEBER: Let me ask a question that

you may know the answer to or maybe not. The agency has a goal, a time goal as to how long it takes them to go through the significance determination process which is sort of a performance measure on the senior reactor analysts.

How are you folks in Region II doing with respect to meeting the time goal to produce the answer?

DR. TRAVERS: Good question, and that's the next presentation.

MR. SIEBER: I should read ahead, or maybe I did and that's where the question came from.

(General laughter.)

MR. SCHIN: Do you have any other questions on that? Okay.

We have team composition here. It was a small team. We had a lead inspector which was me, a senior reactor analyst, and a basic-qualified inspector who was basically in training for doing this type of inspection.

The inspection itself, we had what we call a bagman trip -- it's an advance information-gathering trip to the site -- which was done by one person, me. I went for one day and collected all the information that we requested.

Then we had a prep week in the office, one week on site, and then we had one additional week in the office because we didn't finish everything we needed to do while we were on site but we brought enough information back with us to finish the review.

The results of the inspection were that we didn't have any new findings of significance that we identified. We saw that there were some opportunities for improvement in the licensee's process for determining root causes, contributing causes, extent of cause and corrective actions.

We concluded that overall, though, the corrective actions that were already completed -- which they had done to restore compliance, they had changed the procedures and changed the number of pressurizer heaters that were powered from the SSF -- and the corrective actions that they had planned, if well done, would have been adequate to address the issues, and we closed the one open white finding.

Any other questions?

MR. SIEBER: Thank you very much.

MR. SCHIN: If not, I'll turn it over to Scott Freeman.

MR. FREEMAN: Good morning, everybody. My name is Scott Freeman and I'm the senior resident at

Sequoyah and I'm going to talk about a white finding that occurred at Sequoyah where they had a binding in one of that RHR breakers.

To start with a little background, TVA began using ABB Services to refurbish their 6900 breakers in 1996 and between then and 2000 they had numerous problems with these breakers. In fact, at one point they even removed ABB from the authorized supplier list.

It got to the point in September of 2000 that the refurbishment cost for safety-rated breakers reached $31,000, and based on that, in July of 2001 TVA decided to replace the safety-related breakers with Siemens breakers and began changing the breakers out in November of 2001.

These new breakers were vacuum breakers manufactured by Siemens and modified by Wiley Labs to fit the existing cubicle, and also to make them safety-related.

What I have here is a sketch of the mechanism and you have to excuse the quality of this, I had to do this myself, but over here is a drawing of the breaker, this is the cubicle, and the breaker racks into the cubicle this way.

What I wanted to point out here was when

they started using Siemens breakers, problems began almost immediately, and most of them were associated with this MOC switch, the mechanism-operated cell switch. That's this guy right up here at the top.

It sits in the top of the cubicle and is operated by this long arm that goes to the bottom of the cubicle, and that little horseshoe thing there mates up with a slot on this mechanism on the breaker that operates off of the breaker itself.

Most of these problems were due to the extra force from this breaker. Because it's a vacuum breaker, it operated about twice as fast as the original which multiplied the forces on this switch up here by four, and that's essentially where most of the problems occurred.

MR. SIEBER: That's a cell switch. Right?

MR. FREEMAN: The cell switch is up here; it's two of them in parallel.

Let's go to the next slide. That's the breaker sitting on the floor, and over on the right there this is one of the buses, there's another one across the room from it.

Next slide. That's actually the failed breaker and they're looking at in the warehouse. This part down here is where the problem occurred. This is

that operating mechanism that's on the breaker. This is the breaker operating shaft and there's a rod that runs here that slides this up and down as the breaker opens and closes.

Next one, that's a closer view of it. There's a slot, a notch right here that mates up with a part of the cubicle, and this spring absorbs some of the force, and then there's a bolt right here and an elongated notch. This is where the binding actually occurred.

Let's go to the next one. This is another view of it. You can see the slot here and the elongated notch here.

One more. This is the cubicle. The primary goes in there, this is the secondary connection, and this is the MOC switch mechanism here. That notch we just showed you meets up right here, it operates this up and down which moves that rod.

One more. And this is the MOC switch up it the top of the cubicle and there's the rod coming up from below. This little device right here is a modification they made after they started refurbishing the breakers to absorb some of the force as the breaker opens.

This goes down when the breaker closes and

when the breaker opens this comes up, and they had some problems with so much force here it was breaking these things loose.

Next slide. This is the list of problems that we looked at that shows eight different failures starting in 2002 going all the way up to the bottom one that is the one that actually got the white finding.

MR. BUNACA: Do they go back to ABB?

MR. FREEMAN: They did eventually; I'll come to that. That's their ultimate correction.

The problems started in 2002 and they started with problems found during initial checks with the breaker in the test position and eventually ended up, worked their way through the problems with the breaker in connect position and showing up during PMT, and eventually at the bottom there, an on-demand failure with the RHR pump.

MR. WALLIS: If they failed to close in 2002 several times, why didn't they fix it?

MR. FREEMAN: They thought they did. There were deeper problems. In fact, there were even problems in 2003 that I didn't put up there because they occurred during receipt inspection.

And this last problem, this one on the RHR

pump, was attributed to a phenomenon called bradding -- which I'm going to get to in just a minute -- and the one right above it was also.

MR. SIEBER: It looks like the vendor failed to sailor-proof the mechanism.

MR. FREEMAN: That was part of it. This is the bracket on the failed breaker, this is where the problem actually occurred, and this bolt right here -- this is the side of the breaker, this bolt screws into the side of the breaker. It's a shoulder bolt and it fits up tight against the side, and then this bracket slides up and down in it and there's washers here to take up the space.

Well, what happens here is when the breaker opens, this thing goes down and the very top of that notch hits on the bolt. It was hitting on the bolt and it was causing it to mushroom out a little bit, and you almost had to feel it, but it was just a little bit, and Siemens called that bradding.

So now when the breaker closes and it tries to go up, this bradding acts as a drag force, and if you et enough drag force, the breaker won't latch, and that's what happened on the RHR pump.

The other thing that it depends on is the tolerances between the bolt, the washers and the

bracket.

MR. WALLIS: What's it made out of, that thing that mushroomed out?

MR. FREEMAN: Yes, it's a brass/copper type.

MR. WALLIS: Something soft.

MR. FREEMAN: Yes, something soft.

But what we found was that there was no specs on installation, not tolerance, no clearance, no specs to make sure it would slide.

Next one. This is the same bracket disassembled, and actually I'm going to pass these around here. I have some black and white pictures that go with it.

You can see right here at the top of the slide, that's the bradding. And it's really hard to see, the only way you really know for sure is run your finger on it and you can feel it.

And on these ones going around, I have a picture of this one plus the one previously from the previous failure that they found in the Siemens shop, and we'll come to the Siemens shop in just a minute.

MR. WALLIS: Is this the usual kind of thing you get in these boxes?

MR. FREEMAN: This one is pretty close to

what ABB had, only it's modified just a little bit to absorb the force. This part with the "V" on it actually slides up and down also.

But you can see also on these washers up here, marks where the mushrooming had scraped the washers, and there's a good picture of the shoulder bolt. The breaker side goes right in this slot right here.

MR. WALLIS: That's a nice hard hammer you've got up there.

MR. FREEMAN: Right. Well, Siemens had actually identified this problem in April of 2004 as part of cause investigation for previous failures, and they recommended TVA do inspections.

In fact, on those sheets going around, there's ones that describe for the failed breaker and ones for the Siemens breaker they found in the shop.

They recommended a visual or a functional inspection, and basically they said you could look at it and look for it or you could functionally test meaning you could take the mechanism apart and try to operate it.

And they indicated that a visual was somewhat subjective because bradding was normal, so they told TVA that some bradding could be expected,

but they also stated that the functional would be more accurate, and the best way is to disconnect the mechanism and operate it through its full range of travel.

MR. SIEBER: Even if assembled correctly, the end of that slot will always hit the shoulder on that bolt.

MR. FREEMAN: Well, that was a little bit debatable. It was doing it a lot, I'm not sure it would do it every time.

MR. SIEBER: It looks like it was designed to do it.

MR. WALLIS: But you could make it out of a different material that was less susceptible to plastic defamation.

MR. SIEBER: Well, you know, then you break the bolt.

MR. FREEMAN: The problem was really in not anticipating that this force was there.

Next slide, please. This is what TVA did about this. Because Siemens had said some bradding was normal, TVA chose to do a visual inspection. They had 12 breakers in the warehouse as spare and they did a visual inspection on those by sliding a coin down on that elongated slot to check for bradding and found

some minor bradding and said that was normal.

They inspected the ones in the plant, 6 in the A train of ECCS and 12 in the B train by using a boroscope. The breakers remained racked into the bus and they stuck a boroscope down the side and did a visual inspection with using maintenance personnel only. Engineering wasn't present for the inspection and only reviewed one tape. They were recorded but they reviewed only one tape.

MR. WALLIS: They used the visual inspection but you told us earlier it was rather hard to see?

MR. FREEMAN: That's my opinion, it's almost impossible to see. Actually, it's my opinion that had they done the functional test here, they would have found the problem, but they chose not to.

Next slide, please. So what was NRC doing up to this point? Well, we had been monitoring this using our baseline modules but because TVA was addressing the problems as they occurred, we had no operability concerns, and what I have up here is a list of the ones we did in 2003 and 2004.

The bottom one there, we started doing a PI&R annual sample because the problems just kept occurring and we wanted to see, well, what's their

corrective action program doing about it. In fact, we had exited on that PI&R sample but pulled it from the report because they had two failures between the time of the exit and the time the report went out.

After the RHR pump failed, we got a little bit more concerned. DRS sent two inspectors up for a one-week inspection, and they raised questions about qualification testing. They asked them: Did you not do the thousand endurance cycles that the triple E standards call for?

And the residents, after that happened, started looking back for previous problems and we found that an identical problem to this had occurred in June of 2003 where the corrective action document said the bolt was too tight and the mechanism was binding. And they basically at that time just loosened the bolt and went on.

MR. WALLIS: Even when it was new.

MR. FREEMAN: Yes, it was during receipt inspection.

Also, Chuck Castoe and Steve Cahill came up and had a visit with TVA management to let them know we were really concerned about it.

Next slide, please. At that point, TVA really started looking for the causes. Up until this

point they had been laying off the cause on the vendor all along, saying vendor problems, vendor problems, vendor problems. But when we got more involved in it, they dug deeper and found some process problems.

The first one was this engineering document change process. That's really their like-for-like engineering process. And they did that because it was basically easier to implement. They didn't have to sign off a document every time they put one of these breakers in. And this essentially resulted in them not addressing the impact of the faster breaker operation. Because of that process, they didn't look at all these problems with the MOC switch.

The other thing was they didn't hold the vendor accountable for qualification testing. They were supposed to be getting documentation approving all the qualification, and the vendor didn't do it and they didn't push it. Consequently, the vendor basically did a technical justification in lieu of qualification testing on the original breaker.

MR. SIEBER: So it basically was not physically tested.

MR. FREEMAN: The first one -- they went through five iterations of design; the very first one

was not tested, after that they started doing them.

Next slide. Disposition. This was the white finding beginning July 1, 2004: The RHR train was inop for 14 days and the delta CDF came out to be about 1.3E to the minus 6, and the main drivers were the reduced sump recirculation for small or medium break loca because of the one RHR pump being out, and no sump recirculation for loss of 125V DC battery board 2.

That's because losing that battery board would prevent the opposite RHR pump from starting, so there would be no RHR.

Next one. Conclusions.

MR. SIEBER: This is a BWR. Right?

MR. FREEMAN: No, it's a PWR. It's an ice condenser.

Conclusions. I put there the process worked because as the problems continued to get worse, NRC attention got more focused and eventually the licensee dug deep enough and found their own problems.

MR. WALLIS: How long did that take?

MR. FREEMAN: Well, essentially from when they started in 2001 until 2004, but we really started looking in 2003.

MR. WALLIS: So there's no expectation for

time on your conclusion that the process worked?

MR. FREEMAN: Well, that's why I have the process didn't work up there.

MR. WALLIS: Which conclusion is correct?

MR. FREEMAN: Well, they're both right because actually the problem did get solved, but we had a suspicion all along and the residents had a suspicion all along that there were problems with these breakers. But to really dig into and find out would have required a very intensive design inspection, and in order to continue doing the remainder of the baseline inspections, as long as we felt they didn't have any operability concerns, we kept on doing the baseline inspections. It's kind of a resource question.

MR. CASTOE: But it's also a risk question. The previous failures were not greater than green, they were not risk-significant. When the RHR pump failed on demand, that became risk-significant.

MR. FREEMAN: That's true.

MR. SCHIN: That was the first failure that was actually a component in service.

MR. FREEMAN: Where we had an operability question.

MR. CASTOE: And in NASA-speak, that

became an out-of-family failure and that's what really got our attention because it was out of family from the other ones which we knew were not risk-significant. Chuck Castoe, by the way. So by our process, I think the process worked in terms of we engaged when the risk went up.

MR. WALLIS: This seems to be a problem. When you've got breakers which are poorly designed, they're going to fail, and they failed in various modes and they failed tests and stuff, but nothing is done until it fails in some risk-significant mode, although it's waiting to happen.

MR. FREEMAN: Well, I think that's kind of my dilemma when I sit and thing about whether this worked or not.

MR. SCHIN: Well, not optimally, of course. If they had taken the initiative which we felt they should have, then optimally you would have had resolution of this well before failure.

MR. CAHILL: They did repair a lot of the individual problems. They had a myriad of small problems that cropped up but the root driver that being the accelerated force of this different type of breaker and the incompatibility. But they fixed each individual problem and really never stepped back, and

like he said, they relied on the vendor and the vendor fixed each problem, and they never stepped back and said we really have a bigger compatibility issue here.

MR. WALLIS: Are there other breakers on some other circuit which is even more risky that are the same breakers?

MR. FREEMAN: Yes, they had these breakers in all of their essential switch gears.

MR. WALLIS: So I would think the delta CDF would be bigger if you said the breakers are going to fail.

MR. FREEMAN: Well, this was the only one that was actually inoperable.

MR. WALLIS: But the others are waiting to be inoperable.

MR. SCHIN: They only had a small portion. They were phasing these in, they weren't in all safety-related locations.

MR. CAHILL: The other thing we did was make sure they had one train.

MR. SCHIN: And we went through and analyzed where each one of these Siemens breakers was.

MR. WALLIS: They could have been on every train and then you lose the whole thing. It's a common cause failure.

MR. CASTOE: We looked at it and NASA looked at it and they moved breakers based on risk significance. They took them out of certain components and put them in other components to keep the risk significance low.

MR. FREEMAN: Yes, after the RHR failure, they moved them to where they had them only in one train to eliminate the common cause. But again, that was after the NRC really got looking at it.

MR. DENNING: I think there's an important aspect of this, though, if I'm understanding it properly, that has something to do with the way we license things versus the way Europeans license things, and I don't know whether it's really that deep.

But the problem always comes up when you're taking out a breaker, the breaker that actually was there originally, and you're replace it with some other breaker and you have to have interface equipment that's different, that's new.

MR. FREEMAN: That was my other conclusion.

MR. DENNING: And I'm wondering now and then that has to be made safety grade through commercial dedication process.

MR. FREEMAN: Exactly what they did, yes.

MR. DENNING: And now, you don't do any inspection of what -- the NRC doesn't do any inspection of vendor facilities. Is that true? Like in this case, how did they certify it to be nuclear-qualified? Did they do like a thousand cycles and this kind of stuff?

MR. FREEMAN: Well, it turns out they were supposed to and TVA had a contract with Wiley to go through this commercial grade dedication process, and they were supposed to include qualification in accordance with our Triple E standards.

Siemens and Wiley interpreted that and said, Well, using this standard -- and I can't remember the number -- they can do a technical specification in lieu of endurance testing. TVA didn't call them on that which they should have done, and they eventually admitted they should have done. Had they done that, they would have done the thousand cycle testing and may have found these MOC switch force problems.

MR. DENNING: The utility has to make sure, it's their responsibility that whatever was done to qualify it was really done.

MR. FREEMAN: Yes, that's how I see it.

MR. THADANI: But the Vendor Inspection Branch also has a responsibility to at least go through certain inspections.

MR. WALLIS: I don't understand this at all. I mean, you're hammering a piece of brass with a piece of steel, someone must have at a very early stage in design asked: Is it going to mushroom? I don't understand how it ever got to be designed this way. It seems very peculiar, but maybe I'm naive.

MR. FREEMAN: Well, this was actually a first of a kind type situation. There are other place that are doing this new breaker in existing cubicle situation; they all seem to be different. This was the first one to put Siemens breakers in these ABB cabinets, and because of these two process problems, they actually missed things they should have got.

MR. CARUSO: As a result of this experience, do you have a good sense that TVA watches closely for unforeseen problems when it replaces old equipment with new equipment, especially from a different vendor or a different design?

MR. FREEMAN: Well, I say they learned a lesson. I don't know if they're going to do it every time, we just have to keep watching them.

MR. CASTOE: They have the right checks an

balances in their process, they just didn't follow what their own process says in this case. They went back in their corrective action program and looked at their process and found five other indications, five other modifications where they had used this process and did not follow their process.

MR. CARUSO: If they were replacing a lot of components in a large plant that hadn't operated recently, would you be concerned?

MR. FREEMAN: I would want to check, yes.

MR. CAHILL: This is Steve Cahill. What Scott was saying about the first of a kind situation, TVA was alone in their false sense of security about this because -- if you saw all those Siemens breakers you saw at Browns Ferry, those used to be GE Magnablast breakers -- TVA had gone through Wiley and gotten those Siemens breakers to change out all those things in the same type of process, and that's not the first time Wiley had done that, they had done it at two other plants.

So they worked well, TVA had great success with Wiley using Siemens breakers, so they figured we can use them over here at Sequoyah to fix this problem. And what Scott was saying, that's the first time Wiley had ever done those Siemens breakers in an

ABB cabinet, and they got molded in that false sense of security and figured they could use less than their normal full design change process and they did the like process, and apparently that was a poor decision in hindsight.

MR. SIEBER: Are these breakers unique to the combination of the metal-clad switch gear and the breaker body itself, using one vendor for the cubicle and another vendor for the breaker?

MR. FREEMAN: They are unique and Wiley was supposed to modify them to make them fit, so you could basically just roll the old one out and roll the new one in.

The reason they went for like-for-like was because at Browns Ferry they didn't use like-for-like, they had to sign off every time they changed a breaker out, 200 or however many times it was, and essentially they didn't want to do that again, they didn't think it was worthwhile. That was the main reason.

MR. SIEBER: But do they think it would have been worthwhile at this point in their history?

MR. FREEMAN: They do now, yes.

MR. SIEBER: Of course, signing off doesn't usually fix anything, it just implicates somebody.

MR. FREEMAN: Well, there were some other checks too that the system engineer was supposed to do.

MR. THADANI: So did they issue a Part 21 report on this?

MR. FREEMAN: I don't think so, but I don't really know, I don't know for sure.

MR. CAHILL: You mean at Three Mile Island? There was some other site that was doing the exact same purchase of these breakers for an ABB cubicle and TVA shared information with them, and they had a lot of leverage with Wiley to get these things fixed. They basically weren't going to pay Wiley any money now until the TVA problems were addressed, and that was the only example of where this application was going on anywhere else.

So to answer your question, the intent of a Part 21 was addressed by that.

MR. FREEMAN: Back to what you said earlier, they have now removed all the Siemens breakers from the emergency close positions in the bus and intend to eliminate them completely by spring of next year. They're going back to the ABB breakers.

And that's the end of my presentation. Thank you.

MR. SIEBER: Thank you very much. Well done.

MR. WALLIS: Well, it's a real object lesson how one little tiny detail, the way one little bolt behaves in a little slot can prejudice the safety operation of an important piece of equipment.

MR. DENNING: And PRA didn't find it, did it.

MR. FREEMAN: That was actually part of my last conclusion was that these new type of designs can result in unforeseen problems, and utilities really need to watch that.

MR. RANSOM: Doesn't this equipment have to go through a qualification program?

MR. FREEMAN: It was supposed to, yes, and they did a technical justification in lieu of actually operating it, the vendor did. They read a loophole in the code and TVA didn't call them on it.

MR. DENNING: Well, it's a subtlety as to what's like.

DR. TRAVERS: The other thing that's been touched on here, I think, that's important is this reliance on vendors and the question arose here who do we hold responsible. Well, we hold the licensees responsible and they'll be the ones who are subject,

potentially, to enforcement for matters of this sort, and so they really need to be a little bit more proactive and involved, we believe, in these sorts of endeavors.

MR. SIEBER: Well, strangely enough, we're back on schedule. Thank you very much.

MR. PAYNE: Good morning. Are we ready to continue? My name is Charlie Payne. I'm the branch chief for Engineering Branch II which has responsibility for fire protection. Also, I have both the regional SRAs under my direction.

I'd like to start off with covering the types of fire protection findings in general that we have. You're probably familiar that Hemic and MT fire wraps have been an issue for several years. We've got four sites that have those.

We've had circuit analysis, associated circuit issues, manual actions in lieu of protecting the cabling which is actually a subset of circuit analysis -- this is a pretty significant problem here in Region II and I'll discuss that a little bit more -- reactor coolant pump seal cooling, and safe shutdown.

The circuit analysis is also kind of tied to safe shutdown because if we have problems with

manual actions, then their ability to achieve safe shutdown is also in question.

And then we've got just miscellaneous other things like smoke detectors in the wrong place or oil retention dikes that don't handle the capacity of the tank.

MR. SIEBER: Do you have instances of where a licensee relies on manual actions but didn't ask for NRC approval to do so?

MR. PAYNE: We have some occasion where the licensees did that but there's a high number of instances where they didn't. And I'll cover that when I get to the manual actions log.

The Hemic issue, it's a long standing one, it affects four plants. All four of these licensees are going to NFPA 805, and so that's part of the basis for why they're going to NFPA 805 but hopefully that will get resolved when they do their transition.

The recent testing that NRR and research have done showed that these fire wraps don't meet the one-hour and three-hour resistance rating. And NRR has issued a draft generic letter for comment to basically say that this is a problem and require the licensees to come up with a plan on how they're going to address this issue, and they're going to track all

of this nationwide.

MR. THADANI: So do they declare these inoperable and pass some compensatory measures in place

MR. PAYNE: That's right. And most of these plants have had fire watches in place, but for example, Harris, we've got our triennial inspection team doing that. They were there for the first week last week, they're going back next week. And one of the things we pointed out to them is that they need to be looking at the bigger picture with their compensatory actions. A fire watch isn't necessarily the only thing that they could do to help reduce the risk presented by this.

And also in Harris's situation, they disagreed with the results that we came up with on Hemic. They felt like their Hemic was different, and so they just did a series of tests of their own that I don't have the official results on, but they're trying to demonstrate that their Hemic wrap is actually adequate to maintain a one-hour and three-hour barrier.

MR. SIEBER: Didn't the agency do some tests at Wiley within the last year or so on Hemic, or did they

MR. PAYNE: Yes. We just completed some testing and issued the results this spring, and that's the basis of the generic letter.

MR. WALLIS: I have a couple of questions. What does this stuff wrap and how widespread is it within the plant?

MR. PAYNE: Depends on the facility. Some licensees have used it to achieve train separation when they had Train A and Train B.

MR. WALLIS: Twenty feet or something, whatever the distance is?

MR. PAYNE: Right.

MR. SIEBER: Yes, and adjacent cable train

MR. PAYNE: But for example, Harris uses it extensively in their plant, and so that's one of the reasons it has a significant impact on them. But McGuire and Catawba, they use it but not extensively.

MR. DENNING: Tell me something about 805? Do they use 805 to get around having to -- suppose you can't demonstrate one-hour and three-hour, we don't believe the tests that they come up with, is the only conclusion then that one would then have to replace those wraps? Or can you use 805 in some way to get around it so that you say you prove that it wasn't risk-significant, or something like that?

MR. PAYNE: I think you can prove that if it's not risk-significant, then you don't need to have the wrap there.

Now, there's a requirement also to maintain defense in depth, so I'm not sure how the interface between those will happen. But for example, if you don't have any ignition sources in this compartment but you do have both trains in there, Appendix R would say you've got to wrap them or separate them or something like that. But really, the likelihood of a fire is so small that they're meeting the requirement but it's really a waste of money and they think it's something that is not required. So that's what 805 will be able to achieve for them.

MR. SIEBER: And then all you have to do is hope that there really isn't any ignition sources.

MR. PAYNE: That's part of what we do. We go through there and our new inspection process pretty much has us counting all the different ignition sources. We send our SRAs often out on the pre-inspection visit with our team and he walks around all the fires that we're contemplating and inspecting, and helps us decide on whether these are problems or not.

MR. POWERS: Then you have to depend on your hot work permitting requirements during shutdown

to ensure that there are no ignition sources in there.

MR. PAYNE: That is correct, we take that into account. We'll look at their administrative controls and we'll talk with the senior residents and the DRP branch chief.

MR. POWERS: The trouble, for instance, when we were at Browns Ferry recently, they were displaying their permitting requirements for work and things like that, and not once did hot work show up on any of their lists.

MR. PAYNE: Well, it's certainly a factor. When we come up with an issue, they try and one of their responses is okay, we've got an administrative control, for example, that says hot work, the likelihood is going to be less than what you're assuming, and then we'll have to evaluate that aspect of it.

MR. POWERS: And it's just a persistent problem, especially when you get to these things where the argument is made that there are no ignition sources or there are no combustibles. It works either way because trapped combustibles are just a consistent problem during shutdown.

MR. PAYNE: The circuit analysis, it's again another set of long-standing issues, and it's

primarily related to associated circuits and spurious equipment operations. So the licensees did a pretty good job of identifying these pieces of equipment, the main components are important for safe shutdown and we need to protect or separate those pieces of equipment.

But the associated circuits, the stuff that helps make sure that that equipment operates correctly, the protective circuitry -- I can't think of what I wanted to say, sorry -- but it's associated with making sure that the equipment will work correctly. Those circuits weren't actually evaluated often by the licensees.

And what we have found is that sometimes those circuits run in the same area, were not protected, and if you had a fire in that, you would get some kind of spurious actuation that they weren't planning on that opened a valve that's normally closed and would divert flow away from where you need it to be.

RIS 2004-03 was issued to resolve this, and it gave the licensees a year of enforcement discretion to let them identify these issues, get them into their corrective action program, and start initiating corrective action. And there would be no risk evaluation done. In other words, no matter what

the risk was, as long as they identified them and started getting a program to fix them, we would give them discretion.

We've only been able to close one finding to date out of all of our list of stuff, and that's because the licensee had actually gone out and corrected the issue, and so we gave them discretion on that.

Most of the other issues we have, the licensees have not been very aggressive in trying to come up with a resolution on it. Also, a lot of them are going to NFPA 805, and so they're saying when we go to NFPA 805, we'll fix this issue because it's identified and it will be part of the process.

Part of our concern in that is that some of these plants aren't going to be actually transitioning for another four or six years, so what are they doing in the interim. So when the enforcement discretion expires at the end of the year, we need to be having a plan on is this going to be adequate for the interim for those plants.

MR. WALLIS: This is something that comes up all the time when you've got something which plants should be doing and they're very dilatory about it, and it doesn't seem to be any sort of scale. I would

think that as they get later, they get penalized in some way and something happens. Give them an incentive to get on and do the job.

MR. McCREE: We do have that capability and have exercised it in other areas via our enforcement policy.

MR. WALLIS: But it's up to your judgment to say now you've taken such a long time, we're going to whip you into shape.

MR. PAYNE: One of the things to remember, though, is that for all of these issues, the licensees have instituted compensatory actions. So from a risk perspective, it probably is not an issue, but if you start getting enough of them added together, then you start having to reevaluate whether there's really a problem or not.

Next I want to talk about the manual operator actions which, like I said, is a subset of circuit analysis, and it's often used to mitigate spurious equipment operation in lieu of cable protection, but on occasions they do have some risk-significant critical operator actions that they're doing instead of trying to operate the equipment from the main control room.

Licensees have long believed that it was

an acceptable alternative to Appendix R3G2 requirements, and Region II is one of the first that identified that licensees were doing this and this was a problem, and it's used extensively in Region II.

We've got some plants that have tens of not hundreds of manual actions imbedded in their fire protection procedures.

MR. WALLIS: This led to something. We had a meeting on this just last year. Didn't this lead to some agency action to clear this matter up, all these plants that were taking credit for manual action without getting permission and so on?

MR. SIEBER: Well, we wrote a letter on it.

MR. WALLIS: We wrote a letter on that too. Did that lead to some agency action?

MR. SHACK: Well, there's a Nuclear Newsflash that they withdrew that draft rule yesterday.

MR. WALLIS: The rule isn't going to come out after all?

MR. SHACK: They proposed to remove it, they requested permission to do that.

MR. PAYNE: Originally there was a plan for manual actions that were determined to be

feasible -- and we had established some proposed criteria for measuring feasible -- that it would be acceptable for those to be used in lieu of protection. But there are a number of problems with that, one of which is if you have enough of them from a risk perspective, the likelihood of 100 percent success all the time is pretty small, even if they are feasible.

We've been having problems at some of our sites where we've identified non-feasible actions where the operator just couldn't do the job. And like I said, they often have high human error probability.

MR. WALLIS: That was a concern we had, I remember, in our meeting with these folks that were presenting this stuff about operator actions, and they had to go down these stairs and along here and put some ladder up and do something or other, and we were thinking are they really going to be able to do this with the conditions which are current in the plant.

MR. PAYNE: And it may be only one operator that they've got dedicated to doing that, and if he breaks his leg climbing up that later.

Reactor coolant pump seal issues, to date we have identified five Region II licensees that have this concern, and just to recap, if you lose reactor coolant pump seal cooling, Westinghouse has shown that

for after 13 minutes or so you don't want to be restoring seal cooling or thermal barrier cooling to that seal because you could get a small break loca through the reactor coolant pump seal, thermal shock and it would cause the seal to dislodge or get tilted, you get popping, numerous different concerns.

And they issued guidance probably about 10 or 15 years ago that ended up getting implemented into the EOPs that if you have a station blackout, when you lose the reactor coolant pump seal cooling as a result of that, do not restore it when you get the power back because you don't know how the reactor coolant pump seal is going to perform, and you may not have your equipment needed to compensate for a small break loca.

And what they recommend is that you cool down the plant and get established and then get established and then do an evaluation on your reactor coolant pump seals before you restart.

Well, we found that some licensees didn't implement that guidance when you have fire that causes you to lose reactor coolant pump seal cooling, and often their mitigation strategy for the fire to achieve safe shutdown required them to go out there and come up with a way to restore charging.

Quite often that's the way they do it is

they'll protect one charging pump and that charging pump is going to go through the reactor coolant pump seal. They didn't isolate it.

And we had some licensees, as you'll see on my slide here, that took 60 to 90 minutes to restore charging flow, and they just turned it back on, went right to the reactor coolant pump seal, and we said, How do you know that that's not going to cause a seal loca?

And we processed one of them at Surry and it turned out to be a white finding after we did an extensive Phase 3 analysis of it, and the other four plants were still processing. Well, I take that back. We did North Anna already which is the sister plant of Surry. Because of their plant configuration and the way they implemented their fire procedures slightly different than Surry, it turned out to be a green finding for them.

MR. WALLIS: Do they all have the new seal material? There was an improved seal material that Westinghouse came up with.

MR. PAYNE: You mean the high temperature seals?

MR. WALLIS: Have they installed that material in all of these plants?

MR. SIEBER: That doesn't solve the problem.

MR. WALLIS: But it's still an improvement, though.

MR. PAYNE: That is true. And when we first identified this issue, Surry was the first site that we identified this with, our original risk analysis said just losing the seal cooling was going to cause a small break loca, and after interactions with NRR and Westinghouse, we came to the conclusion that the analysis with the new high temperature seals will protect them adequately. If you just remove the seal cooling you should be all right.

MR. SIEBER: And leave it alone.

MR. PAYNE: Leave it alone, that's right. And we have some licensees that that's their strategy is they make sure that when they lose the seal cooling, they'll go out there and isolate it before they restore their charging for later on.

The 60 to 90 minutes is tied towards how long before they lose pressurizer level, and when it gets down to the bottom, they need to have charging flow coming back.

MR. SIEBER: And that's based on tech spec leak rates. Right?

MR. PAYNE: That's right.

MR. SIEBER: Sixty to 90 minutes. Not a seal leak.

MR. PAYNE: That's correct. Well, the actual 60 to 90 minutes include tech spec and up to 25 or 21 GPM, the station blackout type of criteria that we applied, but not the 200 or 480 GPM that risk analysis had looked at.

MR. THADANI: If the licensees chose in the past to deal with station blackout and the breaks in the service water system where you lose seal cooling most of the time, they would have taken care of not only that issue but also this because they would have had capability for some level of charging fairly quick basis.

MR. PAYNE: That's right.

MR. BUNACA: So those plants that opted for that option, they would be okay.

MR. PAYNE: Yes. If they could come up with some way to quickly restore cooling to the seal, they would have been all right.

For example, there are some plants that do that, they recognize that they need to get cooling back and their procedures prioritize some actions to get the seal cooling done, and 13 minutes is generally

the criteria.

You did ask a question about NFPA 805. All of the plants in the country right now that are going to NFPA 805 are in Region II. That's Duke Energy with their Oconee, McGuire and Catawba plants. That's the order that they intend to transition to NFPA 805.

Recently Progress Energy has indicated their intent to transition to 805 with Harris first, then Crystal River, Robinson, and Brunswick.

We've gotten some indication that Dominion is interested in it, primarily, I think, from a Region I plant, the Millstone site, but they would transition, obviously, all their plants if they do decide.

MR. SIEBER: Once you do an initial plant, each plant is easier for incorporation.

MR. PAYNE: And then Oconee and Harris are the private plants for the agency and what we'll be doing is actually sending some observation teams three or four times a year during this two-year transition to observe their process, to give them some feedback on are they heading in the right direction or not, what kind of issues do they have with that, and also help us to develop our inspection procedure that we'll

have to use with this new process.

They'll be getting enforcement discretion during the transition, and that also applies to the old issues that they have if they committed during '05, so they were supposed to be intending to get some more licensees interested in transitioning. So far it's only been progress in Duke Energy.

But you do do a risk evaluation on these fire protection issues, but trying to identify any risks of red color or severity level 1.

MR. THADANI: But they have to do a fire PRA, don't they, a good quality fire PRA?

MR. PAYNE: It is not required, actually.

MR. THADANI: I though the reg guide just issued guidance on that.

MR. DENNING: I think that was our issue, Ashok.

MR. THADANI: And I'm saying I thought the staff agreed to modify the reg guide to include the language, and that's the reason I'm trying to ensure that's in fact what was done.

MR. SHACK: I think they agreed for that specific change they would use a PRA-like process to evaluate the change in risk, but you don't have to do a full fire PRA, you only have to do a PRA-like

analysis that encompasses the change that you're making.

MR. SIEBER: That's right, so you can end up piecemealing it.

MR. PAYNE: The licensees that are doing it now recognize the benefit of a fire PRA, and the ones that are transitioning now have a plan of basically developing a fire PRA. But it is not required, as Mr. Shack said, to transition.

And the findings are going to be open until the transition is complete, unless we come up with a process to somehow track them outside of our open items list.

I'll talk about SDP timeliness. That was a concern that you had. Just a little bit of background, fire protection and SSDPC were in the same branch up until October of last year, and we shared resources between those two inspections, and there's 15 required inspections a year in Region II.

And often what happens, the inspector that was on the fire protections team would be going on an SSDPC or another fire protection inspection.

MR. McCREE: Just to be clear, that's the engineering inspection, that's Safety Systems Design and Performance Capability inspection. These are the

two, quote, largest team inspections that we do under our Baseline Inspection Program, fire protection and the engineering inspection are SSDPC.

MR. PAYNE: So as a result, once we got the report issued, I didn't have any resource to dedicate to working on this, on any open items that we had unless they were simple. If they were pretty easy to disposition, we could get those processed through the SDP and issued either in the report or shortly thereafter.

But the complicated ones, for example, the safe shutdown issues, the reactor coolant pump seal issues, they took much longer to do, and I didn't have anybody to pull off of a team inspection to work on these issues.

It had some long-term effects too because if I did try and start somebody on that issue, they probably couldn't get done with it before they did need to get on the next inspection -- let's say he had four weeks to work on it -- couldn't get through it and then he'd be wrapped up on the next inspection.

And then if I had somebody else that had a month's worth of time available, that person would have to reinvent the wheel, if you will, trying to catch up to where the analysis was and understanding

the issue and then trying to make some headway.

It was very inefficient, we lost a lot of continuity, and if I tried to keep one inspector on it, then it was hit and miss as another inspector was available over time.

And I've got an example if you'd like to go through that where that happened.

MR. McCREE: So you've got a complete picture, the level of effort required to evaluate the significance of fire protection findings in general, and particularly the complex ones, is rather significant. The SDP Appendix D inspection under Chapter 0609 is -- excuse me -- Appendix F, is very resource-intensive. It requires a combination of certainly our senior more seasoned inspectors to be involved in the data gathering and analyses, as well as the senior reactor analyst.

The picture that Charlie is painting for you is a true one. We've gone through some organizational issues as well as a resource issue and the work itself is quite time-consuming. So it takes very deft management and very close coordination to get it done in a timely way.

MR. PAYNE: And if you go to the next slide, you'll see some of the things that Victor was

talking about. It's very difficult, the SDP is 24 pages long; most of the SDPs in the reactor area are only a couple of page long and they're usually fairly cookbookish. And then there's another 116 pages worth of guidance that you don't just learn it and forget about it, you're going to have to keep referring to it because it covers different situations, so the situation you're in, you're going to have to evaluate each of those things independently.

MR. POWERS: Are all your plants are currently Appendix R plants?

MR. PAYNE: No. It's a combination.

MR. POWERS: You've got them all?

MR. PAYNE: Yes.

And as Victor also mentioned, it requires a lot of data collection. One of the things that we found out, and it's on the next page, Step 2.8 is very difficult to do. It basically says once you're done with figuring out what the fire risk is, now go back into the reactor SDP and see if you've got any equipment to help mitigate this issue.

Well, what a lot of people don't recognize is that that means I've got to go find out where all the cables are for all the mitigation equipment and see if they run through this fire area and are

affected by the fire, because they obviously didn't protect them because that's not part of their safe shutdown strategy.

And trying to figure that out and then also figuring out does this equipment really work or not is difficult.

And as Victor also mentioned, it requires someone with a lot of plant operational understanding to integrate all of that. Most of my inspectors are electrical inspectors. We've taught them about integrated plant operations, but they haven't operated a plant and they don't know some of the interrelationships between that.

And I only really have one senior inspector that has integrated plan operations, and that's Bob. You've heard from him. I've got another senior mechanical inspector that he does a good job of it but he's really a mechanical inspector, he's not an ops inspector.

MR. McCREE: This goes to the earlier question where we were looking at the succession planning strategy. We asked about what that meant, how many, quote, fire protection experts we have.

Charlie has one senior, quote, licensed fire protection engineer, but Bob and McKenzie Thomas,

we've developed into fire protection experts, but what they also bring, and it's absolutely essential to implementing this inspection in a quality way is the integrated plant operations knowledge that allows us to not only find things but then evaluate the significance of it.

MR. PAYNE: In particular, the 90-day time limits goal that you were discussing with Bob earlier, it's really kind of unrealistic for complicated fire protection issues.

If you figure out all the different things that need to be done in order to process a greater than green finding to final determination, that 90-day goal, it basically requires the SDP to be done within two weeks. I have a hard time getting it done in two months, let alone two weeks, unless it's a fairly simple fire protection issue.

MR. POWERS: And this problem just doesn't go away, does it, and we started off with an SDP that was okay, to say the least, and now we've gone to one you can understand, you just can't do. It's like they don't want us to find fire issues in the plant.

MR. PAYNE: Yes, and we recognize that, and as a matter of fact, we just got done with a team going to V.C. Sumner to work on one of the reactor

coolant pump seal issues at V.C. Sumner, and we had on that team Bob, my senior reactor analyst, a reactor analyst from NRR, a fire protection expert from NRR, plus a contractor from Sandia who is probably the fire protection expert -- you may know him, Steve Nolan -- he was on the team.

And they went through to process these open issues that we had with V.C. Sumner, and it took them a full week of time, and the intent was to do a Phase 2 analysis so we could proceed on with the SDP, and they ended up doing basically a Phase 3 analysis because it was going to come out greater than green, it was going to be yellow or white, and then we'd have to do a Phase 3 probably to make sure it was right.

So they went ahead and worked on it and it came out the issues were green. And that was a success, but it required special organization to get this talent pool together to make it work.

On some of our simpler issues, for example, the smoke detector, it requires basically that you have very low degradation in order for you to screen it out green. If you look at Phase 1 of our SDP, anything that's greater than low degradation requires you to go to a Phase 2 analysis. And most of those issues will probably screen out in the Phase 2

fairly easily, like the smoke detector or the alarm, but the other ones that require you to go to the end to 2.8 which are the safe shutdown ones, they're the ones that take a long time to do.

MR. McCREE: We've had a significant amount of discussion with NRR and other folks in headquarters about the timeliness goal and the implications for fire protection, and I believe we're at a level of understanding now where our process is being changed. In fact, the metric will recognize that for some issues like fire protection, 90 days is really not realistic, that it would take longer, and in fact, the overall goal will be 180 days, but the process will take this into account.

We also had discussions last week -- in fact, we did our lessons learned on this visit at Sumner that Charlie was just talking about, and what did we learn from that that could help us to evaluate in a more timely manner other more similar findings. And developed the understanding that may indeed allow Steve Nolan to be involved in some other thorny findings that we have and areas where we need to train our inspectors and SRAs to help them to deal with other issues.

MR. POWERS: The problem with extending

the time is it doesn't eliminate your basic problem, you just don't have the manpower to do it, and bringing in contractors is great, except now on your succession planning you have to take into account contractors which is quickly becoming a formidable problem for you, and there's no obligation on the contractor to have succession planning there either.

MR. McCREE: We also discussed that and the need to transfer or develop our own expertise such as that which Steve Nolan has, and that's going to take a while, but there's an integrated way to get there.

One is sending people along with Steve to develop that knowledge and classroom training. We need to have that in-house.

MR. POWERS: Do you need it in-house or is the better solution is anything that you can screen out in an expeditious way -- and I mean literally in a day -- that you can toss over the fence to NRR and let them handle

MR. PAYNE: We have some ideas and we tossed them around also in the lessons learned meeting that we had and we're making some proposals to them that would help expedite the SDP, simplify it, in particular with Step 2.8, and we're going to forward

that as a recommendation to change it.

And they were open to the idea, and they're going to evaluate and see if maybe that's something we could do where Step 2.8 is actually a go/no-go kind of step, and if we're okay with that, we'll go forward with that as being a final result, and if everybody in the circ decides that we need a better answer, this is a little bit too complex, then we'll commit to going to a Phase 3 type of analysis and committing the resources to doing that.

DR. TRAVERS: But having those resources centered as opposed to distributed.

MR. POWERS: And it's not a criticism of you but if every region tries to set up the kind of expertise and divert the manpower that's going to be required -- because you could send a guy and say work 180 days on this but you're going to do it one month, then two weeks off doing something else, then one month, you'll end up in the same problem. You'll come back and say it's going to take 270 days to do this. I mean, you'll never get out of this problem.

And if it's an integrated analysis where you have to look at plant ops, electronics, mechanical and fire all at the same time, you're never going to get there. I mean, it's not your fault, I'm not being

critical of you guys, it's just that they're asking you to do the infeasible here.

MR. SIEBER: It's an agency-wide problem, and as I see it, you have a moratorium on associated circuits, you have the introduction of 805, and in fact, the triennial exams have not covered every issue. You have operator manual actions to deal with. And to me it looks like the day after a huge snowstorm and there's a lot of work that needs to be done to get back to normal, and the question is how vulnerable are during the months and years that it will take to get to a backlog that is normal.

MR. SCHIN: And that's a good question. We addressed that in this recent meeting with the licensees that are going to NFPA 805 and what they have for compensatory actions for all of these non-conforming conditions that they're finding is fire watches. So like Oconee has fire watches roving all over the plant covering all the different areas.

So what we're going to have to get into when we next meet with them over the next few months is how many of these non-conforming conditions, we have to look at what type of things they are.

In all cases, a fire watch may not cut it. You may have, even after you have the fire watch,

there may be some net increase in risk, and so you don't want to have too much of that.

MR. SIEBER: You know, a fire watch is a guy with a day's training and eight bucks an hour, and he may be a roving fire watch but he's watching five fire areas or ten fire areas.

MR. SCHIN: Right, exactly.

MR. SIEBER: To me there are better ways to do that

MR. SCHIN: Right, but by our regulations they're not clearly required.

MR. SIEBER: It says it's okay.

MR. POWERS: This story on the SDP for fire has just been going on since the start of ROP, it's just a very difficult area and it does not seem to me that it's getting the kind of management attention at headquarters that it deserves. I mean, they keep coming up with "Well, it satisfies this" all the time. I mean, I think you guys have got a real problem.

MR. McCREE: What we have is this tool that, as Charlie indicated, is good for screening relatively straightforward issues. It's a bit more resource-intensive when the issue is more complex. We've been working very closely with NRR on this

issue, as I indicated, and the resources and timeliness, all those factors, we have understanding and we have what we have, and we'll just work our way through it.

MR. POWERS: Like I say, I think you guys are doing better than I would have ever expected. Actually, I'd expect you to be screamingly angry over this.

MR. THADANI: There is a focus on the timeliness issue at headquarters, but I'm not convinced of this focus on really understanding how complex this is.

(General talking.)

MR. POWERS: I mean, I think that's the take-home lesson here

MR. McCREE: It's the reason why we leveraged this visit at Sumner is to develop that understanding and have the lessons learned.

MR. McCREE: It's going to take what it's going to take to get a quality answer, and to get a quality answer, I think there needs to be a broader understanding of what it takes to get there.

MR. POWERS: Well, you do this trip to Sumner and you come up with some interesting conclusions, I think it will be useful to us if you

come share it with us like at a Fire Protection Subcommittee or something like that and just focus in on this whole step here. I mean, I think that would fun. Don't you, Richard?

MR. DENNING: Absolutely.

MR. POWERS: And see what the strategy is for handling this.

MR. WALLIS: I would like to know what's going on in the other regions. Presumably they have the same situations.

MR. SIEBER: In three more years we'll know

MR. PAYNE: The NEI is sponsoring a fire protection information forum next week, and all the branch chiefs, except for one, and some NRR representatives are going to be there. And while we're there, I've asked them to have a meeting to talk about this, because I've got the same impression that are we an outlier, are we the only ones that have problems or not.

And just anecdotally, I found that at least Region IV has a long list of fire protection issues.

MR. POWERS: Based on historical evidence, you guys are better prepared in fire protection than

the other regions, if you ask me.

MR. PAYNE: I would like to try and get that feedback from them as well.

MR. SIEBER: You're on easy street, relatively speaking.

(General laughter.)

MR. PAYNE: We'll, we'd at least like to think that we've got a plan for moving forward, it's just that it's not something we can implement instantaneously.

MR. SIEBER: Well, there's a tremendous amount of work and it's complex work, and I think those are the two keys, and I think that there's a failure to recognize how important fire protection is. If we add all modes, all pipe PRAs, all of a sudden it would stick out, but fire is probably in the same realm of importance as normal day-to-day operation or shutdown operation. That being the case, maybe the resources need to follow.

MR. WALLIS: What needs to happen in Washington to solve this problem.

MR. PAYNE: The interesting thing is if you look at the amount of time they expect us to spend on the triennial inspection, it's 200 hours every three years, we spend well over that because that's

assuming three inspectors for two weeks basically, and I need more than three inspectors on that team to do an adequate inspection.

And that's what I tell them, we need to focus on finding safety-significant issues, we'll work out the risks afterwards. It's not something we can ignore, obviously, but he priority is making sure that the plants are safe.

MR. SIEBER: My impression, just working with a few licensees, is the licensees aren't prepared from a documentation standpoint to make your job efficient.

MR. PAYNE: That is true, we have found that out during our inspections.

MR. SIEBER: I mean, it's one of these paper-shuffle deals.

MR. SCHIN: My experience is that our inspection procedures and the number of hours for the inspectors for two weeks would work out fine if we didn't have any findings. So our problem is we're always having findings.

MR. PAYNE: I've got just a couple more slides, if you don't mind.

The next slide is just a current status. We have 31 open items, seven of them are new this

year. That doesn't include LERs that the licensees open if they've got a fire protection issue. Seventeen of them are tied to plants that are going to NFPA 805; four of them are Hemic, as I mentioned; seven circuit analysis issues; seven of them we're working pending SDP; and three of them are potentially greater than green.

That's the Turkey Point findings that are on headquarters' tracking list and I've got my senior reactor analyst and the project engineer from DRP at Turkey Point today. They're working on identifying the information they need to do this SDP, with the goal of completing it by the end of September.

We have four other issues that are pending additional inspection or information from the licensee. I've got eight of them that we've resolved but we just haven't documented them in the report, we're in the process of doing that. And one of them we've done a regulatory conference and we're pending the final significance determination which we hope to do next Tuesday.

Corrective actions, we've covered some of this. We've obtained help from DRP as well as NRR to help us work on these open items. We've obtained additional contractor support in FY '06 to free up

some of my inspectors to work on SDP stuff.

Also, as we staff up we're planning to have two separate fire protection inspection teams, one team is doing an inspection, the team that just finished is working on any open items, any URIs that they identified, and they'll have 6 to 8 weeks to work on this and it will be the whole team that's going to be available to do that.

MR. McCREE: Going back to contractor support very briefly. You mentioned earlier on the engineering inspection, the SSDPCs were going from about five a year to 18. In the past, Charlie would get one, maybe two contractors a year to train for the fire protection school program.

We've got NRR's attention and they're going to give us four this year which is twice. It was very difficult but we've convinced them that that's needed to not only address a backlog but to allow Charlie some flexibility in scheduling his inspections.

MR. PAYNE: Correct. Right now I don't have the staff to do two full teams independently. Plus like this year, we're still supporting the engineering inspections, but starting this coming fiscal year, we've got dedicated people, I'm staffing

up, and while I'm still staffing up, I've got the contractors to help us out.

And part of that, like I said, we're restricting our support of other inspections to really high priority issues like special inspections or AITs, that kind of thing.

And that's all I have.

MR. SIEBER: I think we're at the end of the agenda.

DR. TRAVERS: We're very suspiciously on time, Chairman. I think you laid down a challenge to us, and perhaps to the committee as well. We're on time here.

I guess I'll just sum up by saying I think we've covered a pretty broad range of topics. I think they were arranged in advance with your staff so there would be items that the committee was interested in.

And so we certainly do appreciate the opportunity to have a dialogue with you, not just today but on an ongoing basis as is appropriate for any of the issues at hand. Whether they be Browns Ferry or wherever, we can hopefully support your activities by providing some of the insights that we gain from our conduct of the inspection program here in Region II and throughout the regions, actually.

MR. SIEBER: I can tell you, without reservation, that the meeting and the reports that your folks gave us are excellent, and they really add to the perspective that we have in the functioning of the agency, because in the regions this is where the rubber meets the road. And individual inspectors and branch chiefs see in more detail the issues and the problems and give us a very good perspective of the kinds of things that we ought to be focusing on and directing our attention.

So I, personally, and my colleagues truly appreciate your spending the effort to be our hosts, and I'm sure that we will meet again, perhaps pretty soon or at least with some or your personnel because there are a lot of activities that are going on.

I also think, having met a number of your folks either here or on other occasions, that you have an excellent staff and very talented and very knowledgeable, and I think that's a tribute to the many good years of management of the Region II office.

So I wish, on behalf of my colleagues and the full committee and our staff, to thank you very much for hosting our visit here.

DR. TRAVERS: It was our pleasure. Glad you could come.

MR. SIEBER: Thank you.

And with that, I would like to adjourn the meeting.

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

CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Advisory Committee on Reactor Safeguards Plant Operations and Fire Protection Subcommittees Region II Visit

Docket Number: n/a

Location: Atlanta, GA

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Laurel Stoddard
Official Reporter
Neal R. Gross & Co., Inc.

McCree + Shea DIVISION OF REACTOR SAFETY SKILLS MATRIX - SUCCESSION PLAN

SKILLS NEEDED	STAFF NEED	STAFF ON BOARD	2005			2006			2007			PROJECTED NEW HIRES	SUCCESSION ACTION PLAN
			E	M	L	E	M	L	E	M	L		
STRUCTURAL ENGINEERING	2	2 Non-DRS 1	1	1(1)		1	1(1)		1	1(1)			Qualify EC in 2005 Transfer a DRP Insp to DRS in 2006 Train EC on ASME B31.1 Piping in 2005
ILRT /LLRT /Containment	1	4	1	1(1)	2	1	1(1)	2	1	1(1)	2		Train EC in 2006
ISFSI	1	3	1	1(1)	1	1	1(1)	1	1	1(1)	1		Train EC in 2006 (Soil Engineering)
SEISMIC	2	4	1	1(1)	2	1	1(1)	2	1	1(1)	2		Train EC on GeoTech Eng in 2005
Heavy Loads	2	4	1	1(1)	2	1	1	2	1	1	2		
METAL. ENGINEERING	4	4	3		1	3		1	3		1	Hire ISI Eng in 2005	Qualify EC as Eng Inspector by 7/06 Qualify EC as Eng Inspector by 8/06 Train EC on Stainless Steels in 2005
Erosion/ Corrosion/MIC Mechanisms	2	4	3	1(1)		3	1(1)		3	1(1)			
NDE / ISI / Welding	3	7	4	1(1)	2	4	1(1)	3	4	1(1)	3		Train ECs in ASME Sec IX in 2005 Train EC in Metal Welding in 05 Train EC on UT Level 1 in 05 Train EC on UT Level 1 in 2005 Train LC on UT Level 1 in 2005 Train EC on ASME Sec IX and Sec XI in 2005 Train EC on ASME Sec XI in 05 Train EC on ASME B31.1 piping in 2005 Train EC on ASME B31.1 Piping in 2005
Non-Code Repairs (GL-90-05)	3	4	2	1(1)	1	2	1(1)	1	2	1(1)*	1		
BWR Internals	3	3	1		2	1		2	1		2		
Steam Generators	3	4	3	1(1)	1	3	1(1)	1	3	1(1)	1		Train EC on Zetec Eddy Current in 2005

SKILLS NEEDED	STAFF NEED	STAFF ON BOARD	2005			2006			2007			PROJECTED NEW HIRES	SUCCESSION ACTION PLAN
			E	M	L	E	M	L	E	M	L		
MECHANICAL ENGINEERING	7	12	6	2(2)	4	6	2(2)	4	6	2(2)	4	Hire Mid-Career Mechanical in 2005 Transfer EC From NRR In 1/05	Qualify EC as Eng Insp 6/05 Qualify EC as Eng Inspector 6/07
Design and Operation of Pumps/IST	4	7	3	2(2)	2	3	2(2)	2	3	2(2)	2		Train EC on ASME Pump/Valve in 2005
Valves/IST	4	9	3	3(3)	3	3	3(3)	3	3	4(4)	3		MC Attend MOV/AOV Conf in 2005 Train EC on ASME Pump/Valve in 2005
Heat Exchangers	2	10	3	4(4)	3	3	4(4)*	3	3	4(4)*	3		Train EC in Service Water Eng in 05 Train EC on Service Water Eng in 2005
Water Hammer	2	3	1	1(1)	1	1	1(1)	1	1	1(1)	1		Train EC on Waterhammer in 2005
Safety/Relief Valves	3	3	1	1(1)	1	1	1(1)	1	1	1(1)	1		
Emergency Diesels	2	4	2	1(1)	1	2	1(1)	1	2	1(1)	1		
Spent Fuel Pool Cooling	2	5	3	2(1)		3	2(1)		3	2(1)			
HVAC	2	2		1(1)	1		1(1)	1		1(1)	1		
Coatings	2	3	1	1(1)	1	1	1(1)	1	1	1(1)	1		
Freeze Seals	2	3	2		1	2		1	2		1		
Governors	2	4	2		2	2		2	2		2		
Bearing Lubrication	2	4	2	1(1)	1	2	1(1)	1	2	1(1)	1		
Ice Condensers	1	1			1			1			1		

SKILL NEEDED	STAFF NEED	STAFF ON BOARD	2005			2006			2007			PROJECTED NEW HIRES	SUCCESSION ACTION
			E	M	L	E	M	L	E	M	L		
		Non-DRP 2											
ELECTRICAL ENGINEERING #	5	10	6	2(2)	1	6	2(2)	1	6	2(2)	1	Hire Mid Career in 2005 Transfer DRP Insp 1/05	Qualify EC as Eng Inspector 6/06 Qualify EC as Eng Insp 7/06 Qualify EC as Eng Insp 7/05
Distribution Systems (Breakers/Switchgear)	2	6	3	2(2)	1	3	2(2)	1	3	2(2)	1		Train EC in Power Sys Relays in 2005 Train EC in Substation Eng in 2005 Train MC in Power Cables in 2005 Train EC in Substation Eng in 2005 Train EC on Prot Relaying in 05
Instrumentation and Controls - Digital and Analog	2	7	4	2(2)	1	4	2(2)	1	4	2(2)	1		
V/V of Software	2	5	3	1(1)	1	3	1(1)	1	3	1(1)	1		
Instrument Setpoint Calculations	2	5	2	2(1)	1	2	2(2)	1	2	2(2)	1		
EQ	2	3	1	1(1)	1	1	1(1)	1	1	1(1)	1		
MOV/SOV	2	4	2	1(1)	1	2	1(1)	1	2	1(1)	1		EC attend AOV/MOV Users Group Conf in 2005
Batteries	2	2	1	1		1	1		1	1			
Logic Circuit Testing (GL96-01)	3	3	1	1(1)	1	1	1(1)	1	1	1(1)*	1		
EHC (Turbine Control)	1	1		1(1)			1(1)			1(1)			
Maintenance Rule	2	4	2	1(1)	1	2	1(1)	1	2	1(1)	1		

SKILLS NEEDED	STAFF NEED	STAFF ON BOARD	2005			2006			2007			PROJECTED NEW HIRES	SUCCESSION ACTION P
			E	M	L	E	M	L	E	M	L		
RISK ANALYSIS	2	2		2(1)			2(1)			2(1)			Train MC on Quant Risk/Reliability in 2005 Train MC on PRA Application in 05
Risk Expertise	3	1 Non- DRS 2			1			1			1		
NUCLEAR ENG. (Reactor Physics)	1	5	1	3(2)	1	1	3(2)	1	1	3(2)	1	Hire Co-Op in 2005 Hire Co-OP in 2005	Qualify EC as Eng Insp 6/06
Operations Inspectors EOP's(Excludes OL personnel)	2	3		2(2)	1		2(2)	1		2(2)	1		
OPERATOR LICENSING EXAMINATION	9	9 (Non-OL) 2	1	8(3)		1	8(3)		1	8(3)		Hire Two Examiners in 2005	Qualify MC as Examiner 5/05
Licensing Assistant	1	1			1			1			1		Train a backup LA in 2005
HEALTH PHYSICS	6	8 Non-PSB1 3	3	4(1)	2	3	4(2)	3	1	4(2)	3		One Insp attend the REMP Conf in 2005

SKILLS NEEDED	STAFF NEED	STAFF ON BOARD	2005			2006			2007			PROJECTED NEW HIRES	SUCCESSION ACTION PLAN
			E	M	L	E	M	L	E	M	L		
CHEMISTRY	1	2		2(1)			2(1)			2(1)			Train MC in RadioChem in 2005
EMERGENCY PLANNING	2	2 Non-PSB2 3		2(2)			2(2)			2(2)			
FIRE PROTECTION	3	5	2	5(2)		2	5(2)		2	5(2)		Hire Co-OP Fire Protect Engineer in 2005 Hire Mid-Career Fire Protection Engineer in 2005	Train MC in NFPA Sprinklers in 2005 Train EC on Fire Alarm Codes in 2005 MC attend NFPA Sprinkler Seminar in 2005 Two Insp to NEI Fire Prot Conf in 05
10CFR50.59	1	4	3		1	3		1	3		1		
License Renewal	4	5	1	1(1)	3	1	1(1)	3	1	1(1)	3		
Pre-Op Testing	1	1		1			1			1			
PHYSICAL SECURITY	8	6		6(1)			6(1)			6(1)		Hire a Security Inspector in 2005	Qualify MC as Security Inspector 5/05 Qualify MC Security Inspector 5/05 Train MC in Adv Security in 2005

E: Early Career (EC); Less than 40 years Old
M: Mid Career (MC); Greater than 40 years Old and less than Optional Retirement Eligible: () / *; Eligble for Early Retirement
L: Late Career (LC); Eligible for Optional Retirement

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