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NUCLEAR REGULATORY COMMISSION

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615TH MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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WEDNESDAY

JUNE 11, 2014

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ROCKVILLE, MARYLAND

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

COMMITTEE MEMBERS:

JOHN W. STETKAR, Chairman

HAROLD B. RAY, Vice Chairman

DENNIS C. BLEY, Member-at-Large

RONALD BALLINGER, Member

SANJOY BANERJEE, Member

MICHAEL L. CORRADINI, Member

DANA A. POWERS, Member

JOY REMPE, Member

PETER RICCARDELLA, Member

MICHAEL T. RYAN, Member

STEPHEN P. SCHULTZ, Member

GORDON R. SKILLMAN, Member

DESIGNATED FEDERAL OFFICIALS:

MAITRI BANERJEE

JOHN LAI

GIRIJA SHUKLA

MIKE SNODDERLY

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

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

(8:30 a.m.)

CHAIRMAN STETKAR: The meeting will now come to order. This is the first day of the 615th meeting of the Advisory Committee on Reactor Safeguards. During today's meeting the committee will consider the following.

Fuel Cycle Oversight Program Enhancement Project, Overview of the SHINE Application for Molybdenum-99 Medical Radioisotope Production Facility, Level 3 PRA Project Plan, Update and Overview of Regulatory Analysis Guidelines, and Preparation of ACRS Reports.

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

Portions of the session on the overview of the SHINE application may be closed in order to discuss and protect information designated as proprietary. We've received no written comments or requests to make oral statements from members of the public regarding today's sessions.

There will be a phone bridge line. To

preclude interruption of the meeting, the phone will be placed in a listen-in mode during the presentations and committee discussion. A transcript of portions of the meeting is being kept, and is requested that the speakers use one of the microphones, identify themselves, and speak with sufficient clarity and volume so that they can be readily heard.

And with those introductory remarks, we'll turn immediately to the first topic on the fuel cycle program, and Dr. Michael Ryan will lead us through.

MEMBER RYAN: Thank you very much, Mr. Chairman. I appreciate the opportunity to bring the Fuel Cycle Oversight Program to your attention, and I guess without any further delay I'll turn it over to Kurt Cozens to start us off. Good morning.

MR. COZENS: And I will make the first presentation, but first I'm going to ask Mike Franovich to say a few opening remarks.

MR. FRANOVICH: Thank you, Kurt. Good morning, ACRS members. My name is Mike Franovich. I'm chief of the Programmatic Oversight and Regional Support Branch in the Office of Nuclear Material Safety and Safeguards. I have a few opening remarks here today to capture or characterize what we're about to present to you today in two distinct sections, or

two distinct presentations, I'll say.

The last time we met with the full committee, I believe, was back in the 2011 time frame. We did have a subcommittee meeting, a meeting with the subcommittee, Dr. Ryan's committee, in May 7th, last month. So we have had an opportunity at least at the subcommittee level to provide a status update and so forth, but it's been some time for meeting with the full committee.

About the last time we met with the full committee we were crafting SECY-11-0140 on revising the fuel cycle oversight process. By my count, this is perhaps the third attempt to revise or refine the fuel cycle oversight process, the third attempt in the last 15 years.

Some have characterized this project as a marathon project. We have continued to make incremental improvements to today's fuel cycle oversight process, but we haven't gone that final step to go through what I would call a major change, something akin to what you see in the reactor oversight process.

So it has been a long time and a long journey on this particular project. We did receive very detailed and clear direction from the Commission

on the SRM for SECY-11-0140. That detailed SRM requires us from time to time to go back and look at it to make sure we're meeting the Commission's expectations.

We have translated that SRM into an executable project plan. The SRM isn't laid out as a project and it's not chronological in terms of its expectations, so we have translated the detailed SRM and we, by and large, work to the project plan as it's written today.

Today you'll hear about two specific presentations. One is on the status of the RFCOP and our efforts to re-baseline the next two phases of the project. We have essentially completed Phase I of the project on time and on schedule.

There are a lot of essential building blocks in Phase I that we have to work on to ensure that when we get to Phase II and III that at least we're taking care of those basic building blocks, for example, the corrective action program guidance of which I'll speak to in a minute.

I'd also like to acknowledge a lot of the work for the RFCOP represents more than NMSS's efforts. We have a large contingent of staff down in Region II that participate in this project. NSIR is

also involved, and the Office of Enforcement.

We're under the auspices of a steering committee. That's not uncommon for large projects in the agency, but we do have a steering committee of senior executives that provide us additional direction and guidance. Thank you.

For the RFCOP effort, Kurt will obviously go into details about that here in a few minutes, but I'd also like to note on the corrective action program our licensees do have corrective action programs or processes. Most of them are not akin to what you would see on the power reactor side.

But we felt it was necessary to provide guidance to what it would look like to enhance a corrective action program, because we think a CAP is a very core program that's needed for major oversight process if we're going to go in the direction of what you see in the reactor oversight process. The Commission's given us lots of direction in that area, and Sabrina Atack will cover that.

Without further note, I'll just turn it over to Kurt to start on the RFCOP status.

MR. COZENS: First of all, let me introduce myself. I'm Kurt Cozens. I'm a senior project manager, I have the lead for the RFCOP

project.

First of all, the purpose of this presentation is to provide the ACRS with a status of the RFCOP project. That's the Revised Fuel Cycle Oversight Process. And we'll talk about some details.

This is an abbreviated presentation, basically the same one that we presented to the subcommittee. And in the interest of time we've tried to hit the highlights, so I will not go into quite the level of detail that I did at the subcommittee.

First of all, just to reflect what does FCOP, the Fuel Cycle Oversight Process, address as far as the regulatory space? Part 70, Part 40, Part 76, that's the space that we're talking about here and working in. These are all fuel facility type of activities, and so we go on from there.

This is a slide that actually I spent a great deal of time discussing at the subcommittee. It discusses the 15 years of the history of this project. That's a long time for a project to keep going, even for me.

Let me just kind of hit the highlights of how we got to where we are. It started in 1999, when basically the Commission asked us to look at fuel cycle oversight process. This is the same time when

the ROP was being developed and being processed and NMSS was asked to look at the subject.

By the 2002 time frame, the Commission directed the staff to proceed with development of a revised fuel cycle oversight process. That was an issue, it was a slow start. By 2006, the Commission says pause.

Basically in 2002, I think it was, or somewhere earlier we had started the ISA process of having the fuel facilities develop a more risk informed type of activity and that was still in progress. And it was a key understanding that we needed to proceed for the RFCOP.

So by 2006, now, we're restarting. We put it on pause. By 2010, the staff had developed a sufficient amount of direction to bring this up to the Commission and also up to the ACRS, and they submitted a SECY-10-0031 that requested approval of the project.

The Commission did not approve that project and gave some additional guidance telling the staff to go back and take a few extra steps on this. That redirection occurred in SECY-11-0140 that recommended proceeding with the RFC project development and the implementation that was the scope of that.

There were several options that were prepared during in that SECY. The Commission approved Option 1, which is what I will be speaking about today.

Today in 2014, we not only have published our project plan we're essentially complete with Phase I of the three phases that the project has, and I'll talk about those in more detail. So in a slide that before, I think, it took us 20-plus minutes to talk about, that's the nutshell of the long history of this.

We've also met recently, as Mike mentioned, with the ACRS back in 2011. That's when we discussed the SECY-11-0140. And from that in the ACRS letter that was published, it, you know, basically came up with the following conclusions and recommendations that did believe that what had been proposed was an improvement over the traditional process. That the staff needed to develop cornerstones, cross-cutting issues, a significance determination process and an action matrix, the core elements of a revised fuel cycle oversight process.

So much of the nominal concepts of an ROP, but structured in a different manner than is appropriate for fuel facilities. The ACRS at that

point had agreed with the staff on the recommendation of significance determination process cornerstones that is based upon the hazard based approach versus an operational based approach. I'll speak more about that in a little bit.

And that the ACRS also agreed that we should develop a qualitative significance determination process and that we might pursue the quantitative, which is something that I will also discuss a bit in a moment. And that we wanted to provide oversight processes that had an incentive for licensees to adopt it and work with us on it.

Many of you were probably not even participating on the ACRS back in 2011, and if you go back further, probably more of you were not participating. So let me recast what are the deliverables in this particular project.

There's Phase I has several preparatory activities. These are the revising the enforcement policy that is the activity where we would take the existing enforcement policy and permit severity level for violations to be treated as a non-cited violation, pending the fact that the licensee had an approved effective CAP program. This is what Sabrina will talk about later. That enforcement policy has been done.

The next one was a, Activity 1.B is really a series of inspection procedures as inspection manuals that were being brought up to date just to make them in current space.

There was a revision there that staged enough to go forth so that we could incorporate any RFCOP guidance that's necessary in the inspection. But that RFCOP not having been developed, we haven't modified these for those purposes, just a cursor.

The development of a CAP guidance, that's what Sabrina's going to talk about so I won't steal her thunder. We will also be developing inspection procedures to inspect any approved effective CAP programs.

Determination and issue characterization. There was quite a bit of discussion going into this. Basically, this centers on the concept of performance deficiencies that have been used in the ROP process and maybe the CROP process, and how would we treat that in the fuel area. So that one I will talk about a little bit more also.

And then the last one was to develop a more-than-minor set of compliance thresholds that as inspectors are making determination, is this minor or greater than minor, we have it for fuel facilities

because we did not have that. And that is a modification of IMC-0616, basically those activities that are either completed or near done.

Phase II is really the development of activities that constitute the RFCOP process. The development of cornerstones is one activity. The development of a significance determination process, in this case the qualitative. The performance assessment process and the supplemental inspection program which is the product which comes out of the decisions that are made. Do we need --

CHAIRMAN STETKAR: Kurt, could you advance the slides? It helps our recorder sometimes to follow the slides.

MR. COZENS: I should have done that. I apologize.

CHAIRMAN STETKAR: It's a low budget operation.

MR. COZENS: I understand. Anyway, these were at Phase II, and this is the step that we find ourselves at in today's space. We will be starting that in about the July time frame.

Phase III is a requirement coming out of the SRM to have a pilot program. And then also added into the SRM was the qualitative fuel cycle

significance determination process versus the quantitative. And the SRM asked us to look at that and give some guidance on should we pursue in that space or not.

Then obviously the last step is the implementation of the results that come out of the pilot modifications and what do we recommend on implementing, because it is a decision by the Commission whether or not we proceed at that point or not. Those are the three phases which I wanted to summarize to bring us back up to common space.

MEMBER RYAN: Kurt, one thing on the last activity, Number 8, the implementation. Do you have kind of a feedback or an evaluation plan on how you're going to evaluate how it's going?

MR. COZENS: That would be part of the, when we do it there's always a need to not just release something. You've got to monitor it because you're going to find things you didn't anticipate.

MEMBER RYAN: All right, always. We talked a little bit about that before, so I wanted to make sure this whole committee --

MR. COZENS: There would be. It's part of the implementation plan. A feedback check will be provided to make any adjustments as necessary.

MR. FRANOVICH: So I might add to that. This is Mike Franovich again. I would envision when we get to that point that, you know, one of the goals of the project is to try to harmonize what we're doing in the fuel cycle oversight area with some of our other oversight programs.

So I would envision that as you're familiar within the ROP there's an annual self-assessment that goes on that actually is reported to the Commission. So I would imagine that we would be part of that effort to provide a status report and checkback.

Other mechanisms used such as surveys, stakeholder surveys to get feedback directly from licensees, not just internal feedback, these are other tools in the tool chest that are commonly used in other oversight programs. So I would imagine we would get to that point and link into those efforts as well.

MR. COZENS: Thank you. So just as a high level summary, where do we stand today? Phase I, we're targeting to having it wrapped up by June 30th, 2014. We're probably within a matter of days of having that done. I will note that the current schedule to completion of Phase I is September 2014, so we're actually a couple months early. But we're

trying to keep this on pace because it fits the needs and appropriateness as we proceed.

MEMBER SKILLMAN: Kurt, when you declare victory on Phase I, how will the affected facilities be drawn into use of the product?

MR. COZENS: Well, the Phase I, our preparatory activities, it is not implementing the RFCOP at all. We are still in the development phase of the RFCOP, so as far as transitioning to the RFCOP implementation, not at all.

But I want to mention that all the way through Phase I and all the way through all the phases, we have heavy engagement with the various stakeholders, licensees, NEI, public, and we do that at every phase.

I would note, like, for instance, when we enter into Phase II when we develop the multiple forms of cornerstones we might have, we would expect to have engagements with the industry and licensees and public on each one of those to get their feedback. It has been done that way ever since the get-go of the process, the project here.

MEMBER SKILLMAN: Thank you.

MR. COZENS: So just a summary, some of this I somewhat covered but I want to focus –

MEMBER CORRADINI: Can I just go back to Dick's question? So this is a preparatory phase, and the facilities, I'm assuming, are enrichment facilities? The whole fuel cycle at some point would be affected.

So is there something, is it a lack of consistency that drove this or is there something, is there a gap that required this? I haven't been to the subcommittee, so I'm just trying to understand –

MR. COZENS: First, I would say that we do have an FCOP process currently that works.

MEMBER CORRADINI: Okay.

MR. COZENS: This is, but when you get to the assessment it is a subjective evaluation on how are the plants performing, licensees performing. Just as in the ROP, the purpose was to have a more systematic, rigorous, visible, predictable process and that's what the RFCOP process is intended to bring out.

So we're making it a more predictable process by doing this. We're having a greater level of consistency through the agency on how we manage licensees, and so that is the purpose of the project.

MEMBER CORRADINI: Okay.

MEMBER BANERJEE: So could you, at least

for me, though I also didn't attend the subcommittee, what are the facilities that actually get covered here? How upstream do we get?

MR. COZENS: Upstream or downstream? Upstream, all the way through the --

MEMBER BANERJEE: Uranium milling, you don't?

MR. COZENS: No.

MEMBER BANERJEE: Mill tailings management, you don't?

MR. COZENS: No. That's why I said upstream versus downstream.

MEMBER BANERJEE: Yes. How far do you, where do you --

MR. COZENS: When we start manufacturing the enrichments.

MEMBER BANERJEE: Enrichment.

MR. COZENS: And through the fuel.

MEMBER BANERJEE: Enrichment facilities.

MR. COZENS: Yes.

MEMBER BANERJEE: And fab.

MR. FRANOVICH: Conversion facilities as well.

MEMBER BANERJEE: Conversion, fab, and then what about downstream? Where do you go? Is

there any downstream facilities after the fuel comes out?

MR. FRANOVICH: No, this is very much on the front end of the fuel cycle.

MEMBER BANERJEE: Only the front end.

MR. FRANOVICH: The front end, yes. And not the very front end with the mining part, but --

MEMBER CORRADINI: It's not mining.

MEMBER BANERJEE: It doesn't include the mill tailings management.

MEMBER CORRADINI: So once the yellowcake is produced, then you start watching it. I mean, in other words if this leaves the mine mill, it goes into enrichment and you start watching it. I'm trying to put down the interface.

MR. FRANOVICH: For example, Honeywell facilities in the scope, they're a Part 40 licensee. So for uranium hexafluoride production they're in the scope.

Then you look at our fuel manufacturing facilities, you know, Westinghouse facility in Columbia, they're included. Global Nuclear Fuels, they're included. AREVA Richland facility is included. Enrichment facilities such as LES is included in New Mexico, and as well as B&W for naval

fuel production and Nuclear Fuel Services in Tennessee.

MEMBER BANERJEE: So you include the naval fuel production as well?

MR. FRANOVICH: Yes.

MEMBER BLEY: And if we ever have a reprocessing plant?

MR. FRANOVICH: Ultimately, if that ever occurs they would be under scope, yes.

MS. ATACK: By then the RFCOP should be complete, right?

MEMBER BLEY: No comment.

MEMBER BANERJEE: But the storage facilities are not under your jurisdiction.

MR. FRANOVICH: No.

MR. COZENS: So the enforcement policy was issued back in, was it January 2013, I believe, was the date. We have a revised 14 inspection procedures and one inspection manual appendix. We're issuing the CAP reg guide, which again Sabrina is going to talk about in much more detail.

We are in the process of issuing the more-than-minor criteria which is a new appendix to 0616 IMC. We have completed the performance deficiency definition to our internal. We ultimately have to

notify the Commission of what our recommendation is of that and that'll come out in some of it in the future. But that work was completed back in about October 2012.

MEMBER BANERJEE: What brought all this about? I mean was there something perceived to be problematic with this?

MR. COZENS: It went back to a desire to have a consistent, visible, predictable process and the guidance that came from the Commission back in -- don't say 20 anymore -- 1999, which was a long time ago, to examine can the fuel facilities be managed in the same process which the other parts of the agencies are to have this visible, predictable process in place that is non-subjective as it is today?

MR. FRANOVICH: So if I may add, and it's Mike Franovich again. Over time we see a program that's adequate today, the fuel cycle oversight program is adequate. However, over time it's starting to look a little dated compared to the reactor oversight process.

So, for example, if there are performance issues that come up during the assessment cycle in the ROP, you know as a licensee what's going to happen in terms of the colors and the findings in terms of any

kind of supplemental inspection.

So if you are a Column 2 plant or a 3 plant, you know what you're going to get for an inspection regiment for dealing with those performance issues.

In the fuel cycle arena, it's not as predictable. We don't have an action matrix. Essentially there is an assessment, a licensee performance review. It looks at traditional enforcement in terms of results, Severity Level 4 or 3 violations.

But we don't have a very clear, for example, if I had three Level 3 violations in an assessment period, what kind of oversight is going to, increased oversight would have happened with this degrading performance on the licensee's part. So it is more subjective than our other oversight programs are.

MEMBER BANERJEE: But you tell us you're not handling the same sort of safety issues in terms of radionuclides and things like that, right?

MR. FRANOVICH: And our program is scaled to reflect the hazards that are being regulated.

MEMBER BANERJEE: More like chemical hazards and --

MR. FRANOVICH: It's a mixture of nuclear and chemical for --

MEMBER CORRADINI: How many licensees does this affect?

MR. FRANOVICH: My count is there are seven operating facilities. There are some facilities that, or there are licensees that have not started construction yet. They've been granted a license and they haven't moved forward.

MEMBER CORRADINI: So my guess was in order of magnitude a less number, so from 100 to 10?

MR. FRANOVICH: Yes.

MEMBER CORRADINI: So that's approximately right?

MR. FRANOVICH: And a diverse fleet. It's not a homogenous fleet as you know. We've got different types of facilities. So that's an extra challenge for us to come up with the --

MEMBER CORRADINI: And then just to follow Sanjoy's question, was this something that the ten, or potentially ten, licensees feel is a benefit and you've, over the prior to '99 there was request to do this because of inconsistency?

What I'm trying to understand is, kind of going along with Sanjoy's question is there a need,

who observed the need, you know.

MR. FRANOVICH: This is what I would call more of an enhancement. In the reactor side in the late '90s, as some of you may have lived through this experience, there was an outcry from industry that look, there's a lot of literal compliance and violations we're dealing with that really don't have a very high safety, nexus to safety, and we're expending a lot of resources on them both you as the regulator and as the regulated community.

We don't have that similar situation here in fuel cycle facilities. The industry has been, on this part of the nuclear industry has been very consistent in their messaging in saying that they believe this is a low priority activity. That it is an enhancement to today's program.

And so we don't have the same, I'll put another word, forcing function for change. There is a desire again to try to make a program like this one more harmonious with some of the other agency programs.

MEMBER BANERJEE: This should bring order into things --

MR. FRANOVICH: In currency, I would say, in terms of how we do business. So make it a little

bit more risk informed performance base for an oversight process.

MEMBER BLEY: From what you're saying, I'll turn it around. The old qualitative subjective approach on reactors came under a lot of pressure for being arbitrary and very subjective with lots of complaints. That situation doesn't exist now with your licensees?

MR. FRANOVICH: It does not exist today. We don't have the same, as you recall in the power reactor community voiced a lot of concern to the agency as well as to members of Congress. That situation isn't present here today in the fuel cycle community.

MR. COZENS: I just might add, one of the things that industry has requested in some letters from NEI, which I'll mention a little bit later also, is the thought that this is maybe something that, a project that could be slowed down a little bit, as Mike said, not quite the priority.

We have actually taken to that in a consideration as we are proposing to move the schedule out a bit in a COMSECY that we'll be submitting up to the Commission.

MR. FRANOVICH: And so some of these

things that we were discussing about priorities and what are the forcing functions and so forth are reflected in the Commission's directions of the staff. And they are very mindful of that it is not a high priority activity, nor did they say it's low priority.

It puts us in an area that makes continuous, steady progress toward getting us to a decision point whether or not there will be an, I'll call more of an overhaul of today's program.

So there are a lot of checkbacks with the Commission, a lot of notation papers going along the way to ultimately get to a point where we say we've piloted such a program and there's a recommendation from the staff either to proceed with a fully revised program or maybe perhaps refinements at that stage. Can't predict exactly where we'll be until we actually do a pilot.

MEMBER SCHULTZ: It seems like there is two ways to go though. One is to slow it down as NEI is proposing perhaps. The other seems to be since there are only a few licensees and there's a program ongoing, we want to provide some conformance to the reactor oversight program that you would move forward rapidly and take the nuggets that are required to implement to the fuel cycle facilities and do it very

rapidly.

And say these are the key points that we want to implement. It's not a big problem that we have to solve, and we can do this. Very rapidly put it in place and give it a go.

MR. FRANOVICH: I'm going to comment, historically that was attempted, actually.

MEMBER SCHULTZ: That was the first try.

MR. FRANOVICH: That was the second try. The first try was put on pause because of the ISA rulemaking and Subpart H, and implementing that rule took many years to get licensees to develop their safety programs.

But the second generation attempt was to do just that. And it was moved, I would say, in such a rapid manner that our external stakeholders had a lot of concerns and so did the Commission, saying, look, we're not sure you can simply translate the ROP and its structure --

MEMBER SCHULTZ: I certainly wasn't suggesting that. I would say, so not translate, select those things that are most important and put them in place.

MR. FRANOVICH: And there was a staff effort and the Commission provided back in 2010 to

SECY-10-0031, I believe it was --

MEMBER SCHULTZ: Yes, that's right.

MR. FRANOVICH: -- they said most of your activities need to go on pause. Some will continue to proceed. For example, what Sabrina will talk about later is the corrective action program guidance to enhance licensee's programs.

MEMBER CORRADINI: And the pause was because too much was being done, what was the motivation for the pause?

MR. FRANOVICH: The pause was too much change without enough stakeholder engagement. It was not quite ready yet.

MEMBER CORRADINI: Okay, thank you.

MEMBER BANERJEE: Are you getting any sort of, I wouldn't say push back, but things happening in the public that require this, you know, is there public attention on this? Is there --

MR. FRANOVICH: There isn't a large public community commenting on this. In selected areas of the country, I would say, for example, around Nuclear Fuel Services, some of the community folks there that give us a lot of comments have commented that our licensee performance review process is not very predictable or clear and they have some desire that we

move toward a more transparent process.

But again, these comments sort of come from a selected, depending on where the facility is and how active, some of the constituents are around there. But I wouldn't say there is a ground swell of public comment.

MEMBER BANERJEE: There's no concerted attempt to have this put in place or --

MR. FRANOVICH: No. I would say no.

MEMBER SKILLMAN: Kurt, let me ask about two bullets on this slide. The fourth bullet from the top, "LES CAP determined to be adequate," and then the final line on the bottom, "considered lessons learned from the LES CAP review."

I know that the Hobbs LES is a 10 CFR 50 Appendix B plant. I believe that most of the other fuel facilities are not. And my question is, is the accomplishment the idea that a fuel plant is an Appendix B plant where the rest are not, and this is the first of what you would like to see as the FCOP matures?

In other words are you saying, hey, look, this is a high mark and we would like this to be implemented on all of the others?

MR. COZENS: Why don't I let Sabrina do

this because she did both the CAP then was part of the inspection team at LES.

MS. ATACK: Yes, I don't, LES voluntarily committed to ASME NQA-1 which is the guidance that the NRC accepts for compliance with Appendix B, so they were not required to comply with Appendix B. The only fuel cycle facility that's required to comply with Appendix B is MOX because they process plutonium. But LES did that as a business decision and a safety decision on their part.

So it's not the staff's goal to upgrade fuel facilities to Appendix B, you know, through the CAP approval process or through changes to the oversight process. But I would say that the guidance outline for corrective action program enhancements does bring the fuel cycle community much closer to an Appendix B level corrective action program than is what's required by their current licensing basis which is management measures.

MEMBER CORRADINI: So again I'm out of, I don't particularly understand kind of what you just said. So let me make sure I understand. So LES chose to do something under 10 CFR 50 Part B which is like a non-power reactor criteria? That's what I'm still --

MS. ATACK: Appendix B to 10 CFR Part 50 is the quality assurance criteria that's required for power plants and for plutonium --

MEMBER CORRADINI: Okay, so it's at a higher order of inspection or precision in terms of QA of how the plant is built and run?

MS. ATACK: Right. It is a more robust quality assurance program than what's required for fuel cycle facilities.

MEMBER CORRADINI: Why would LES do that?

MS. ATACK: They may have asked themselves that question after they committed to it at one point. But they made the commitment in order, I think, in part to portray, you know, an enhanced commitment to quality assurance in the construction and operation of their facility to both their stakeholders and to the regulator. It was completely voluntary on their part.

MR. FRANOVICH: If I may add, Mike Franovich again. Wouldn't want to speak on behalf of the licensee, but they have shared in various public forums that a lot of their staffing up of that new facility and during licensing were folks from the reactor community and they had a lot of familiarity with obviously the reactor standards and requirements.

As part of the process to try to on their

end to expedite licensing, it's certainly much -- how do I characterize this? If you present or propose an Appendix B-style program, of course the regulator's going to say that's most likely fine for a fuel facility. And so that enables them to move through the licensing process a little more quickly.

Now in retrospect, what they've done in exactly that way, I think they've questioned that themselves. But those are business decisions they have made.

MEMBER CORRADINI: But given they did that, they're not an example of anything we're talking about today because they're in a different path. Everything that we're going to talk about today in terms of a re-baselining a consistency or whatever, doesn't affect them because they're under a different licensing base? That's a question. I don't really know the answer.

MR. FRANOVICH: No, this oversight program would apply to them as well. The enhancements they've made to their corrective action program, which Sabrina will talk about in her presentation, they meet the expectations of our guidance that we've put out, draft guidance, actually, at the time.

And so we would say, yes, as a model, as

a pilot, they're showing or demonstrating a corrective action program that would be acceptable, and if other licensees wanted to make similar enhancements on that level we would certainly encourage that and welcome that.

Again we're working from a Commission-driven, incentive based direction to provide licensees incentives to make these enhancements to CAPs. But LES, bottom line, is in the scope of RFCOP.

MEMBER CORRADINI: Okay, thank you.

MS. ATACK: Yes, I think one of the larger differences for them is that having already had an NQA-1 style quality assurance program brought them closer to the mark, you know, as a baseline for a corrective action program implementation than some other licensees.

So we have a spectrum of implementation of corrective action programs throughout our facilities and some have very robust programs and some have, you know, essentially the minimum to meet the licensing basis. So LES was on that more advanced end of the spectrum so it was an easier process for them to follow than maybe for some of the other facilities.

MEMBER CORRADINI: Okay, thank you.

MR. COZENS: And it did permit us to have

an example that we are able to get through to approve an effective CAP program, which is one of the things that demonstrated and as a result we understand there's a couple more licensees that are possibly interested in coming in and volunteering for an inspection for an effective CAP.

Just moving along, let's talk about, basically when we talk about a re-baselining, why? Go back to the what the SRM required us to do. The SRM required that we submit a project plan and schedule, that's meant to publish one. That was done back in July 2012.

And it was actually packaged in kind of an interesting way. We knew a lot about Phase I of what needed to be done at that point. Phase II and III, it was a little bit further out there. We didn't actually publish all the details of how it was to be done.

And so Phase I, we kind of knew what it was, it was manageable, and has about a two-year period, and that's where we are at this point. But Phase II and III had kind of a high level of details that you might accomplish, but not necessarily the step-by-step activities to go from Point A to Point B. And it kind of portrayed a lot of work in parallel.

If you flip to your Slide 20, which I'll put on the screen here quickly, you can see that many of these activities are just blocked out in time showing in parallel. Yes, this work needs to be done, but yet exactly how you get there was a little vague in our publication at that point.

At this point in time we've come back and have looked at the step-by-step activities. So the SRM again as we've mentioned before did not make the RFCOP project a top priority. It's not a low priority, it's not a top priority. We're in that center range of making a definitive steady progress to do it, that's what our project plan had put out there.

But we also needed to reflect some of the realities of other priority projects that are going on in this time frame, the Fukushima response, the Honeywell restart, the resources that we needed for the RFCOP to do that balancing out, the availability of time or places.

And we also at this time we've been working through the CER activities, cumulative effects of regulation is a consideration and how do we work this in as a prioritization? And it is being published in our CER work where we have an integrated schedule for NMSS. It's one of the items that is

discussed as we looked in the slices of time what activities are going on and it's kind of spaced out in that.

I will also note at this point that NEI has submitted, actually, two letters at this point, basically talking about the re-baseline, the project, and they asked us to look at the scheduling of when we do this, maybe delay it a little bit.

And they also asked us to look at some generic risk insights that basically lessons learned that we're going through at this present state. It's kind of my loose interpretation of what that means. Is that your understanding also?

MR. FRANOVICH: Conceptually throwing out the generic risk insights as of trying to gain or seek those insights and apply them to today's program short of going to develop a whole new RFCOP, we've asked questions what generic insights are they referring to because our facilities typically have a proprietary shield on their information.

So there are a few people that can see across the whole fuel cycle sector, all the risk assessments that have been done for integrated safety assessments, I should say. And so although we are open to discussing or reviewing generic, looking for

generic risk insights, and I have staff working on that now, it's more of a concept than actual tangibles.

There isn't a NUREG that says such as you see in the reactor community for NUREG-1150, we're out of our old document by now, versus what we have all these insights from BWRs and PWRs from our various IPE and IPEEE assessments. So we don't have those type of generic insights, but we understand their message.

Where we can apply generic insights we would put those into our inspection program. Our inspection program is already risk informed in terms of our enforcement policy, but we're open to their suggestions.

MR. COZENS: As I picked up this project approximately a year ago and we started to close it out, the Phase I, a lot of good work, a lot of great support from the Region, from other offices to get that through.

And as I looked at putting legs on the process of actually getting from Point A to Point B and to reschedule and look at the detailed steps that need to be done to accomplish Phase II and III we had some assumptions.

The first of all is that all the

deliverables in the SRM are still there. We only sent you one about this change. It's the same project, the same deliverables. We understand that the timeline is that we can't just throw a mass of bodies at it to crash this project, because that would take away from other people's mission-critical work because we have fixed resources that we can use of this.

We need to very definitively continue our interactions with the external stakeholders. We have actually found this quite valuable and want to continue that process as we go through some of these discussions, and that we need to have a pilot program that, and we were thinking at this point that we have a small population of members that might be affected by this. That we probably need to pilot it across them all, because it's a small number to keep the duration, so we can have some population of exercising the program, the proposed program, to see what happens when we pilot it.

So that was kind of the baseline that we assumed in going forth on that. Our considerations of the modeling of the process of going forth, we took a step-by-step, literally, if the document had to go from Point A to Point B, and made certain we included all the steps.

And quite frankly when you have all these process steps it adds to the timeline. It's not a simple, gee, let's just push this out, you know, five days. Well, maybe not. We also looked at what needed to be worked in parallel versus in series.

And if you went back to that initial Gantt chart that I popped up a few minutes ago, you noticed that all things blocked and it has the appearance that like when we're developing cornerstones that they're all worked simultaneously. We have a certain amount of subject matter experts that probably needed to be worked on on one of them, but we felt that that's better to work in a series, also the fact that we would want to have stakeholder interactions as we go through in a series.

We also realized that the ACRS presentations, although it was noted in our initial project plan and schedule, it was not really fully considered in all the steps that need to do. Honestly, coming up to talk to you guys, it was a multiple month process that made that one fully considered it. We needed to consider that in our activities to give this stuff due process, that it's appropriate and necessary and the Commission wants.

MR. FRANOVICH: If I can just comment.

I've seen a steady stream of comments from various commissioners that frequently ask for, and what are the ACRS's views? And my sense was we really need to time this more appropriately such that as we're in the process of drafting notation papers that we're seeking the ACRS's involvement not after the fact.

So we want to be a little bit more proactive here, so we try to build that into our schedule. Obviously that adds some time, but I think it's more efficient on the back end to have that front end type of input than waiting in arrears and going through the Commission voting process for them to get all the pieces such as ACRS's input after the Commission paper's delivered.

MR. COZENS: And as we consider the cumulative effect of regulations, which in the scope of NMSS we have a fairly long list of items that we're tracking in regards to that and where do we need to have the industry and the licensees and the public engaged, we can visually see where it is.

We wanted to be respectful of that, but we also wanted to make certain that we include appropriate points for engagement of feedback from the external stakeholders. And we've made certain that we've added those in there.

MEMBER RYAN: Could you talk a little bit more about, you said you're trying to get them to work as a group, as a small number of licensees in this category. How has that gone?

MR. COZENS: Usually through the leadership of NEI they come to us in a group and represent a single answer. I do know that NEI works with its members to bring a single message forward. So that's been actually quite useful versus diverse messages.

MEMBER RYAN: Yes, true.

MR. COZENS: But yet they're almost always, as all licensees are, almost always represented at the meetings and other opportunities, so everybody there still has an opportunity to have their individual input. So we're actually rather pleased with that.

MEMBER RYAN: And that sounds productive.

MR. COZENS: Yes, it seems to work well.

MEMBER SKILLMAN: Kurt, let me ask this. Your fourth bullet there under the first caret, "pilot program assumes all fuel facilities participate."

MR. COZENS: Versus just one or two, yes.

MEMBER SKILLMAN: No, what I was going to ask is this. The facilities are out conducting

manufacturing today. They are doing in some cases what they've been doing for a decade. So they have the protocol, they have the tempo. They're probably pretty good at what they do.

What is going to incentivize them to change what they're doing? Why would they say, okay, yes, okay, I'm going to do that now?

MR. COZENS: I think Mike wishes to speak.

MR. FRANOVICH: I'll comment on that. I mean this is our oversight process of licensees, and, you know, it's not a matter of they get to choose to be in a certain oversight process or not. It's not a licensing action. It's not a voluntary initiative. It's the NRC's oversight process.

But we need their input obviously, so we have to be very sensitive to the demands on their time. What we see is at a fuel facility, the people that are typically to interface with the regulator there are not many of them for each facility. It comes down to one or two people. I don't have a compliance department and an army of engineering staff to support NRC activities.

So we're trying to be very sensitive to that burden of change and evaluating potential change on the licensee themselves. But when it comes to

incentives, there really is no, I mean this is the NRC's call on how to change its process. So it isn't a voluntary, I want to stay under the traditional inspection program option. It's not envisioned that way.

MEMBER SCHULTZ: Do you envision that there will, in fact, be a substantial change versus a relatively minor effect on, you might call it a tweak here or a tweak there?

MR. FRANOVICH: I can only give you my personal view because obviously there will be, to licensees they might see this as a large change. For those that are more accustomed to the concept of cornerstones and action matrices it's not a, I don't view it as a large change. In fact, some have characterized within staff as a refinement of our program.

We're not looking at major structural changes in our inspection regiment. There would be some refinement. We may actually be able to reduce some of our inspection efforts in certain areas and focus in other areas, so that may be shifting of resources. But I don't see this as a major overhaul.

It may be some restructuring and binning of issues under various cornerstones. Where it gets

a little tricky is in the significance determination process. That's where you might see some changes because we haven't done any work in that area to write guidance, but it can get a little bit more complicated there.

MEMBER BANERJEE: So plants of this nature, assessment of hazards has to be qualitative.

MR. FRANOVICH: Well, we're not prescriptive to say it has to be qualitative. And what you actually see for the integrated safety assessments is a mixture. Some have done more qualitative related type process, others have done quantification almost akin to a PRA. Not quite probabilistic risk assessment, but you see PRA technology used. You see event trees and fault trees and quantification.

MEMBER BANERJEE: But this is not traditional chemicals plants where you do HAZOPs and things like that.

MR. FRANOVICH: Some do HAZOP as a method. So there are chemical risk management type tools that are --

MEMBER BANERJEE: There are a whole bunch of these types of tools.

MR. FRANOVICH: That's correct.

CHAIRMAN STETKAR: I think we're on record saying that, you know, for simpler types of processes and facilities a qualitative assessment is perfectly adequate. On the other hand is if you get into more complexities that quantification often helps you in terms of developing a ranking. You know, you have some metric at least that you can rank order things and determine priorities, basically, that you can't in a purely qualitative sense. Or you can qualitatively, but your ability to do that objectively, you know, transparently, is a little more difficult.

MEMBER BANERJEE: Yes, typically this happens to pieces where they want to look at various strategies, control strategy or something where they do –

CHAIRMAN STETKAR: Or complex process interactions where it's a little more difficult to identify which particular parts have higher safety significance than others, for example.

MEMBER BANERJEE: So you're very open. You're not prescriptive. It's seems very hard to assess.

MR. FRANOVICH: I'm not an expert in ISA technology or methods, but I understand that going through the rulemaking process is separate from the

oversight process.

If we were to go back in time and look at the rulemaking Subpart H, the Commission was very clear to the staff that we want to be flexible and allow licensees to pick their methodology that best fits their process that they're evaluating, or processes that they're evaluating.

So there are a suite of methods that they can select that are, I believe, in one of our NUREGs, I don't recall the number offhand, that allow them to pick these methods.

MR. FRANOVICH: Well, as a result of our --

MEMBER BANERJEE: Harder to regulate.

MR. FRANOVICH: It's a challenge. Extra dimension we're dealing with.

MR. COZENS: I was going to speak here in regards to the deliverables as assigned by the SRM. And there are three deliverables that are notation vote papers that we owe to Commission that will be passing through here that as a result of our re-baselining and we're looking at the step-by-step and the considerations of series or parallel, all the details of project planning, that we've concluded we're going to be requesting a reset of the dates that

these are due.

Now this will be done via a COMSECY submitted, which we'll try to commit by June 30. So any specific dates on this would be pre-decisional so that's why they're not in here, but we do expect that to go up soon.

But the three notation votes are, first of all, we have a commitment to once we have developed, what do we recommend cornerstones to be? This obviously is something we also want to talk to you guys about. And each of these, by the way, papers have a step to come to the ACRS on it.

The next notation vote paper that is to be provided is one, what is this pilot program? Before we have permission to execute the pilot program, the Commission must give us permission and that's what that notation vote paper.

So we'll have to describe the specifics of in all the things we've developed and how are we going to use those in a pilot program, to be specific that the process would also probably require some advance discussion with the stakeholders, particularly the licensees because they're very much affected by this and how does this work. Well, we continue the ongoing program as well, because that's the formal one at this

point, you know, and how do we blend those things together.

Lastly, once we get through the pilot process we have to look at what have we learned, do we need to make adjustments, whatever, and do we recommend implementing the RFCOP project. And all the details is some of the ones, questions that you've asked previously during this session, so that is indeed the third one.

And those are the three activities that we will be asking the Commission to reset the due dates on those and that would be done via COMSECY that's in process as we speak.

Conclusions. Basically three things came out of this thing in our mind. To complete the RFCOP project as currently scheduled is not practical. It won't work. We've tried it, and I spent literally a couple months now on it.

Many, many hours with Mike going over it and say how can we make it happen faster. We don't like extending things, but from a real-world perspective that's what it's going to take. We recommend re-baselining the project schedule as necessary.

We're actually planning to rewrite the

project plan in a manner that has better, we believe, better communication abilities where we can see details and pull it out for ease of looking at it. Because although the issued one was technically correct, it's a little hard to get to all the details in it.

So we have a process there. And as a result of these two, this study and this analysis we've done and continue to work, which to date we're on schedule -- we're starting Phase II on schedule but we're looking at a little later date on it -- we're going to be recommending the Commission reset some of the SRM ticketed deliverables.

MEMBER BLEY: Sorry, could you say that?

MR. COZENS: We'll be recommending that the Commission reset some of the SRM ticketed deliverables, these three notation vote paper due dates, which all the work we do to belt those notation vote papers what the project really is, but those are our check boxes that, and they're what we want and are required to get Commission input.

MEMBER BLEY: If you've already, even though you're just starting Phase II, in the past you thought through a lot of the --

MR. COZENS: That's correct.

MEMBER BLEY: -- issues that are to be resolved in Phase II. So you're really a big leg up on that. But do you have a planned completion time for Phase II now or are you still working that out?

MR. COZENS: Well, we have it, but that's part of the dates on the notation vote papers. But yes, we've worked through all those steps, and as you indicate we do have some product that we will be starting with and, actually, we're starting that work as we speak right now.

And we have very few people that have worked on that that are still available to support it, so it's a bit of a learning curve. Fifteen years, people move around. They retire. They go to other jobs. They take positions and they're no longer available.

So that has been one of the challenges to basically restart up this activity, after the 2010 we had a hiatus, to get to this point, and also just the duration of it. But fortunately we do have some product to start with and we need to find out, one, do we understand are they correct, do we understand how they will be used.

It's not just the written words, do you really appreciate it. There's a digestion process

that goes on that.

MEMBER SKILLMAN: What is the reset target when you say recommending that the Commission reset --

MR. COZENS: Those are dates.

MEMBER SKILLMAN: 2018, 2015?

MR. COZENS: It's pre-decisional is all I can say at this point, because the Commission hasn't weighed in if those are acceptable, you know.

MEMBER BLEY: When is your paper going up to the Commission?

MR. COZENS: Hopefully June 30th.

MR. FRANOVICH: Our paper will go to the EDO's office June 30th, is our target, and then we are hopeful that it will come out by the end of July.

MEMBER BLEY: Okay.

MR. FRANOVICH: We have a ticket for an annual status paper due in July, so we're using this effort to provide the status as well as a request for reset dates.

MEMBER SCHULTZ: Are the goals that you described earlier that you felt the stakeholders would be finding not only acceptable but meaningful, that is, consistency in the program, risk informed, focusing on safety significance, are those goals well established in the program for Phase II, and in fact

are you seeing buy-in to moving forward with a certain set of initiatives with stakeholders, or is that all still need to be done in Phase --

MR. COZENS: I think that this public presentation to stakeholders, external stakeholders is part of the process to make certain that we can bring it as close to meet our needs as well as model in a manner that is most suitable for them. Because --

MEMBER SCHULTZ: What I'm asking is has the interaction with stakeholders gone far enough so that you can feel confident that there are three or four different goals that are established for Phase II that will be meaningful to the stakeholders and that they will embrace and you can see a success path to completion?

MR. COZENS: That is our intent to be there that that is part of the phase of --

MEMBER SCHULTZ: So part of Phase II.

MR. COZENS: Yes.

MEMBER SCHULTZ: It's not where you are today.

MR. COZENS: No.

MEMBER SCHULTZ: Thank you.

MR. COZENS: Because we haven't defined enough for them to understand what it is even.

Because what we had before may not be where we're going.

MEMBER SCHULTZ: I'm hoping to hear then that that's an early part of the Phase II milestone set. You need to get that done soon in order to be successful with Phase II.

MR. FRANOVICH: If I may comment, I would say the industry understands the overall goals and objectives. They're back into, well, is this really a priority and necessary given the number of violations we receive and so forth.

When it comes to the example of the cornerstones and for how those would look like, in our SECY paper 11-0140 there were two options laid on the table. The stakeholders have looked at those options. They understand the objectives of cornerstones. They do have a preference for one over the other.

That's not the same as the staff's preference or the committee's preference, actually ACRS had weighed in on this back then. But they do understand conceptually where we are. I wouldn't say they all buy in and again to the concept of making changes in the oversight program.

That's the difficulty, because they have said consistently we see a need for perhaps more risk

informing of the inspection program which we are doing on some level, I wouldn't say on a very high level, but they're not on board with this type of change overall, although that's not saying they wouldn't participate in meetings. They have participated. They have given us feedback. But the basic concepts and goals and objectives, they understand that.

MR. COZENS: And honestly, it's not uncommon that industry and staff may have different perspectives of moving forth with any regulatory action, as all of us that are within the industry can probably appreciate, you know, and there's different needs of different organizations to satisfy and sometimes that's where we are.

But we do try to find the most satisfying solution that meets as much as both sides that, you know, this is the staff's process for fuel cycle oversight and we do have some goals of what we're trying to achieve.

So it's one of those balancing acts, can we do it the most optimum way to make it as easy for the industry in the sense of adopting it with as many considerations as we can but yet still meet our objectives.

MEMBER SKILLMAN: Thank you. Let me ask

you a question, Kurt. Are there any of the facilities that are just dead set against change? I say that because I remember when the maintenance rule rolled out.

MR. COZENS: Oh yes.

MEMBER SKILLMAN: When EQ rolled out, actually I can remember when Appendix B rolled out. Just the hate and the discontent and the fighting and just the contention, and the tension in the businesses.

But I think for me the best example's maintenance rule. There was just this huge pushback, and once people realized what it could do for them there was real acceptance. And it has made some huge safety changes the whole industry has benefited from.

But there were people who were saying, or there were companies saying we're not doing this. The NRC is not going to tell us how to do this. I'm wondering, is there a small element of that in the population that you're dealing with?

MR. COZENS: I'm not certain I can say that it's all, but there's always people saying, well, why do I want to change? What's in it for me? And as you note, often it's the end note that it isn't as onerous as it appears to be, and I can think of any

number of examples over the last 20 years where that might be the case.

But we're not hearing through the NEI, who's the more official spokesman, to stop, do not do this ever. There's elements that I think they like, elements they may not like, elements that are undefined yet.

MEMBER SKILLMAN: I think what gives me confidence is the idea that you do have the stakeholder involvement, NEI's involved, and there's participation. And that's certainly a really good sign.

MR. COZENS: We believe that's absolutely imperative that we do that.

MEMBER SKILLMAN: Thank you.

MEMBER SCHULTZ: Let me ask that from a different perspective, and that is, as you get into this with both the stakeholders and with the NRC program on its own, are we finding that there are oversight and inspection activities that we are doing that are not focused on safety significant risk informed types of issues so that we really want to change this, we want to make modifications and enhancements so that we're focusing on the right things?

MR. COZENS: That is a perpetual action that the staff needs to be doing, reevaluating in our inspection activities are we doing the right inspections? And Phase I, actually, had a major element of that of just looking at the way the inspection procedures and IMCs were written, reflecting what do we know in the real world?

And some of those redrafts were done as a result of those Phase I activities, and the FCXI meeting going on, the Region II just reported on that, and there was a lot of modifications made just in the core program.

MEMBER SCHULTZ: So that's a good thing. But then did Phase I, I also identify now we've made some progress in those areas but there are some things that we need to change.

MR. COZENS: They did eliminate some things, they moved some things around.

MEMBER SCHULTZ: I know that. So that's been done at one level. But now I could see going into Phase II with some gusto if in Phase I we identify things that we really only can change if we upset the program, change the program so that it's more effective and efficient from a global perspective.

MR. COZENS: Phase II is where we're defining what the RFCOP process is. And as a result, there is a step in there that actually we've defined explicitly now as a result of our reanalysis that we need to come back to the inspection procedures and find out what do we need to modify as a result of that. That's an element of the activities that need to be done that wasn't highlighted in the initial release of the program.

MEMBER RYAN: Kurt, it seems like they kind of discussed in the first few years of implementation and some success measure that was kind of built into it, you know, I think it's real important to get feedback from the licensees, particularly the, you know, nonreactor type folks, the fuel cycle folks, because this is relatively new to them in the depth they're going to end up in, or the water will get pretty deep pretty quick for them.

What kind of plans do you have to address that? Because, you know, when any new program like this rolls out to probe to that category, having been one I can tell you firsthand that's true, is there's always kind of an initial reaction this makes some sense if it's implemented right. And if we can learn how to do it it'll make our life easier.

Well, somehow that doesn't come around on that very first rollout.

MR. COZENS: Let me --

MEMBER RYAN: It's in a foreign language, I don't understand anything, help me. So how's that step going to work, do you think?

MR. COZENS: Well, the implementation plan which is part of Phase III will have external stakeholder input to figure out what's the best way of implementing that. So that's one element we would want.

We also realize that what we call the core inspection plan needs to be considered, what do we have in that, does it still make sense? Just like we did in Phase I, we need to at some point come back and do that.

But we actually have to have the RFCOP in place to understand what we can do is that part of that implementation is like, here's a start date and go forth and do this, but as we get into that there may need to be some adjustments in the inspection programs that hopefully would be more focused on the activities that are most important and maybe move off of the plate some things that are less important.

MEMBER RYAN: That's what I was thinking,

quickly get back to risk significant prioritization of, you know, let's detect the risk significant issues first. And, you know, one that comes to my mind is fire.

MR. COZENS: So we'll have two opportunities to look at that. As we come back to part of Phase II and redraft inspection procedures there will be an opportunity there to ask the basic questions as well as get the key elements into the inspections, you know, because there's a balancing act there.

And then as it's rolled out and implemented, I think there will be just like in ROP there was an opportunity to come back and sharpen the pencil and see what we really need to do.

MR. FRANOVICH: Kurt, if I may add. One of our assumptions and advantages of doing the pilot in the way we proposed, which is to do a pilot across the entire fleet, is that all the licensees see what proposed changes are on the table and actually have that direct interaction with the inspectors as they're running today's program in parallel with the pilot so they get an early viewing of where we're going.

And we get their feedback, such that if we just did a pilot on two or three facilities and then

we would have those issues of rolling it out and actual implementation and those that haven't participated in a pilot would again say, I'm not that versed in this. I'm having a hard time with this change.

So we think the advantage is is that broader pilot will help get more acceptance of this type of change. The other thing I want to comment on is, I don't want to leave an impression with the committee that today's program doesn't have some risk informing activities going on.

For example, you mentioned the fire protection area. Well, fire is evaluated in the integrated safety assessments. And so when our inspectors go out and look and they do do a periodic inspection, fire protection, they will look at the ISA summary and its results to help focus which areas they should probably do more sampling and inspecting of.

That's true in chem safety, criticality safety uses a big core doing that sampling, but they do pull from the ISAs to help inform the inspection plan before they go out to the facility.

MEMBER RYAN: And I guess, you know, I'm sure you'll agree that after they do it a few times at any given facility it gets a lot clearer as to the way

to spend your time and focus your resources, because you can, you know, you've got the experience under your belt to do that.

MR. FRANOVICH: And you'll know also from a significance standpoint, you know, if the ISA's showing that I have lots of layers of defense in this area I can go and inspect all I want, even if I have a finding it's not going to arise to anything of any great significance. It's important to check that to make sure that's a true statement or outcome, but you need to probably refocus some inspection effort in those areas that do have more significance.

MEMBER RYAN: Well, that's kind of the culture that you're talking about is you want people to adopt a risk significance approach to their operation.

MR. COZENS: Fortunately we have the requirement, the ISA requirement, so it drives that behavior in our inspection program already. The ROP is different because, as you know, the PRAs aren't required, but it permeates the ROP and it was used in inspection planning in that area as well. So we have some similarity with the ROP in that respect.

MEMBER RYAN: Thank you.

MR. COZENS: Just to kind of iterate where

we're going both short and long term. We have reestablished the RFCOP steering committee. It had gone into a dormant phase since about 2010, I believe, at some point. And it is manned by executives from all the affected offices, basically, including, and we actually have a member from OGC sitting on that with us also.

By the end of this month we're hoping to have submitted the COMSECY to ask for the resets on these activities, and we also have initiated, we hope by, you know, by July to have implemented Phase II startup of the project. That is on schedule that it was planned, so we're continuing on the project to that regard to the current project plan and schedule. And we expect to issue a revised RFCOP project plan and schedule that we've worked on which discusses the details of this presentation is also discussed.

Long term, basically we want to issue the Commission papers, notation vote papers on cornerstones, the plant pilot program and the pilot program with the results and the implementation recommendations and details, basically, of where we go, so we have permission to proceed on that basis on the schedule which in that paper will be defined.

And that concludes my prepared remarks.

Any other questions? Anyone else?

MEMBER RYAN: Going once, going twice. Well, thank you very much for the informative briefing. It's been helpful for, I think, everybody to hear the details, so thanks again for your time and your insightful presentation. Thank you.

I think we have another presentation.

CHAIRMAN STETKAR: We have Sabrina. Sabrina?

MS. ATACK: Good morning. My name is Sabrina Atack. I'm a quality assurance engineer in Fuel Cycle Safety and Safeguards Division of NMSS. This morning I'll be talking to you about the status of regulatory guide's 3.75 which provides guidance for corrective action programs for fuel cycle facilities.

This is guidance that the staff has been working to prepare for the past one to two years, maybe more, two to three may be more appropriate, to communicate our expectations for fuel cycle corrective action programs for facilities who are interested in enhancing their programs commensurate with their revised enforcement policy.

And that feeds into the RFCOP, because obviously corrective action programs are a very strong element of an effective, you know, a healthy program

at the licensee facility and correcting issues that are identified.

So before I get into the presentation, I will just recap that fuel cycle facilities have programs for management measures, essentially, as part of their licensing basis. So they don't have what you would expect with an Appendix B corrective action program that you would see at a reactor, which is, you know, a very robust and detailed quality assurance program with very specific criteria for corrective actions.

Our facilities have a set of management measures which entails eight criteria that include incident investigations, procedures, you know, and multiple other items. And one of those items is other quality assurance elements.

And that's where it gets fun, because within the guidance for other QA elements we actually pull in the 18 criteria of Appendix B. So one of those is corrective actions. So all of the facilities have some level of corrective action program implementation.

It's just that as we kind of said earlier in our discussions there's a sliding scale of implementation where you have, for instance, LES which

has gone above and beyond the requirements and implemented a very robust program that's on the NQA-1 level, and then you have other facilities that, you know, are implementing corrective action programs and incident investigations and audits and assessments, but they're doing it at a lower degree commensurate with their requirements.

VICE CHAIRMAN RAY: Let me ask a question. You mentioned Appendix B, we're all familiar with that. You mentioned NQA-1 which is the Section 3 version of Appendix B. Why do you refer to NQA-1? I mean they're not an N stamp holder, are they?

MS. ATACK: Fuel cycle facilities? No. No. But NQA-1, some licensees like LES committed to NQA-1. They didn't really commit to Appendix B, they committed to NQA-1.

VICE CHAIRMAN RAY: Okay, just because it was a --

MS. ATACK: MOX is required to comply with Appendix B. So we have some differing commitments but, you know, NQA-1 is the accepted industry standard for compliance with Appendix B.

VICE CHAIRMAN RAY: Correct.

MS. ATACK: So, you know, they're kind of synonymous, but actually a little bit different.

VICE CHAIRMAN RAY: Yes, they are. But NQA-1 was a version of Appendix B that applies to a code, complement gender is the way I think about it, and it just happens to be applicable here as well, I guess. It's not for any other reason that I can think of.

MS. ATACK: Right. Some of industry uses NQA-1, you know, like for N stamp certification they'll implement an NQA-1 quality assurance program.

VICE CHAIRMAN RAY: They have to, actually. But okay.

MS. ATACK: Yes, for N stamps. But licensees will also implement it, you know, for their corrective action programs. All the power reactors, you know, commit to NQA-1.

VICE CHAIRMAN RAY: Okay. Well, it's just a convenient scaled-down version of Appendix B, is, I guess, the answer to my question.

MS. ATACK: Yes, it's kind of a cookbook to Appendix B. It's the easy template that gives you a really good running head start at what you need to provide in a license application and build into your program. Yes.

Okay, so Kurt stepped through some of the Commission guidance and the communications we've had

in the past with respect to the RFCOP, and I'll reiterate some of the more important ones that correlates a corrective action program guidance development.

So in March 2010, the staff developed SECY-10-0031, and that was the plan to revise the fuel cycle oversight process. As Kurt identified, the Commission disapproved the staff plans to proceed with revising the fuel cycle oversight process, but in that SRM they did recognize the importance of licensee corrective action program development.

And I'll read you an excerpt from the SRM to kind of elucidate that point. The SRM stated that the staff should make modest adjustments to the existing oversight program to enhance its effectiveness and efficiency. For example, given that most fuel cycle licensees are not required to have a corrective action program but have voluntarily developed them, the staff should consider how to best reflect this in the NRC enforcement policy.

The staff's approach should provide incentives for licensees to maintain strong CAPs, as this is an important facet of sustaining high safety and security performance and will be consistent with the Commission's ongoing safety culture initiatives.

So from the get-go, you know, back in 2010, the Commission did recognize the importance of the corrective action programs, and the staff has sought to continue to implement that motto.

So this message was also reiterated in the SRM for SECY-09-0190. And SECY-09-0190 proposed a major revision to the NRC enforcement policy to appropriately address the areas that the NRC regulates and to provide a framework that supports consistent implementation of the enforcement policy. So it was a massive overhaul to the enforcement policy.

And in the SRM for SECY-09-0190, the Commission again directed the staff to propose some revisions to the enforcement policy to provide fuel cycle licensees with credit for effective corrective action programs.

So as a result of the direction provided in these two memoranda, and then two that I will address on the subsequent slide, the staff proceeded with their efforts to update the enforcement policy to provide recognition for fuel cycle facility corrective action programs and also to develop incentives for licensees to maintain adequate corrective action programs.

See Kurt, you gave the high level bullets

on the SRMs but --

MR. COZENS: Same project.

MS. ATACK: -- I'll give some more. You thought you were getting away with the easy descriptions, but I'll provide a little more detail on them.

So SECY-11-0140, which Kurt already mentioned, was entitled "Enhancements to the Fuel Cycle Oversight Process." And in that paper the staff provided the Commission with recommendations for the next steps to enhance the fuel cycle oversight process.

They also provided an update to the Commission on the status of the activities undertaken to provide fuel cycle licensees and certificate holders with credit for effective corrective action programs. The paper identified that the staff had developed objectives and attributes for an effective CAP which have been better with stakeholders during public meetings.

During those public meetings there was general agreement among the stakeholders that the objective and attributes were applicable to an effective CAP. And so those basic elements of an effective CAP that were developed in the development

of SECY-11-0140 have been translated into the guidance documents that we will discuss in this meeting. So they've been carried forward as we've revised the guidance and enhanced it.

SECY-11-0140 also proposed the policy change to give licensees with an effective CAP credit in the enforcement policy. In order to engage stakeholders and solicit feedback on the staff's plans to incentivize CAP development through such policy changes, the NRC staff published a proposed policy change in the Federal Register in September of 2011.

And that proposed policy change described a potential revision to the enforcement policy to give licensees credit for having an effective CAP. Specifically that policy change provided licensees with the ability to have the NRC disposition notices of violation associated with lower safety significance findings, which will be Severity Level 4 violations as non-cited violations if the licensee enters the violation into its corrective action program and meets certain other criteria. And those other criteria are related to willfulness and repetition.

So then SECY-11-0140 also described a process for licensees to obtain credit for their corrective action programs. And the process that was

outlined by the staff included amending facility licenses with a license condition related to corrective action program and then following up with inspection to verify the effective implementation of that program. These elements of a process implementation have been translated into the draft guide that we're discussing right now.

So finally, in the SRM for SECY-11-0140, the Commission directed the staff to go ahead and proceed with development and implementation of the incentives for licensees to maintain an effective CAP.

And finally, the last Commission paper that I would like to discuss as background to development of fuel cycle facility corrective action program guidance is SECY-12-0047. In addition to other changes, this is the paper that sought Commission approval of revisions to the enforcement policy to provide that disposition of Severity Level 4 violations as non-cited violations for those facilities having an effective corrective action program.

In the SRM for SECY-12-0047, the Commission approved the revision to the enforcement policy, thus codifying the incentive for fuel cycle licensees to retain adequate corrective action

programs. Now to the good stuff.

So now that we've discussed the guidance and the background for development of fuel cycle facility corrective action program guidance and incentives, we'll discuss the chronology of the document development itself.

So following in the Commission's direction, the staff formalized the CAP elements that they had discussed in public meetings and in SECY-11-0140 by developing a guidance document that described the elements of an accepted corrective action program.

Initially that guidance document was issued as Draft NUREG-2154. The draft NUREG provided guidance to the staff to review the submittal of amendment requests describing licensee corrective action programs for fuel cycle facilities.

Multiple public meetings were held to obtain industry feedback on the draft NUREG content and its formulation. And then in February 2013, the staff issued the draft NUREG for public comment in the Federal Register.

In April 2013, the staff held a public meeting to discuss the draft NUREG and answer any industry questions on the draft guidance. During the public meeting and in a subsequent comment letter

received from NEI, industry commented that the staff should convert the draft NUREG to a draft regulatory guide.

Industry's rationale for that comment was twofold. First, the industry cited that it would ease implementation burden of the guidance for those who were interested in implementing a CAP that those licensees would be able to follow a more streamlined process for implementing the guidance, whereas a draft NUREG provides guidance to the staff on performing an amendment review, or licensing review, the draft reg guide provides guidance to the licensee.

So they thought it was a more appropriate vehicle, and also that they will be able to commit to the reg guide in lieu of providing a more detailed and substantive amendment request which would have to go through the grand licensing process at headquarters, and they may have to answer RAIs and it could take, you know, three, six, nine months depending on schedules.

So licensees felt like we were directed to provide, you know, an incentive for licensees to develop CAPs and really give them that carrot. And they felt like doing the guidance in the form of a reg guide would be much more of an incentive than using

the draft NUREG format.

So after deliberation and consideration, the staff agreed with the comment and proceeded to withdraw Draft NUREG-2154 and convert the guidance into a regulatory guide.

The staff concluded that the conversion was consistent with Commission direction to provide incentives for licensee CAP development as it presented a reduced time and resource burden to licensees who wish to engage in the CAP incentive process.

The staff also concluded that the use of a reg guide was the appropriate vehicle for providing CAP guidance to licensees. In developing the draft guide 3044, which we hope to issue in the near future as reg guide 3.75, the staff maintained the same basic CAP objectives and attributes that have been identified in correspondence with the Commission in Draft NUREG-2154 and in interactions with stakeholders.

So we've been consistent throughout the process. That's the good news. The guide follows the standard reg guide format and includes identification of six basic elements that the staff considers to be acceptable when developing corrective action programs

for fuel cycle facilities.

These elements include the licensee development of a corrective action program organization. This is the organization that's required to implement the overall program, so it's, you know, the outline of who's in charge, who does what, what the interrelationships are between the organizations within the facility.

And they're required to be sufficiently independent of the production organization in order to ensure the ability of the CAP to function free of schedule and profit considerations and to enable that appropriate focus on safety. It's one of the basic premises of an effective corrective action program.

The guide also identifies that licensees must develop, implement and maintain written policies, programs and procedures that describe the corrective action program. These documents will ensure that the CAP functions effectively and consistently, and that the reg guide principles are appropriately implemented.

The third element is that the CAP must include mechanisms to identify, report and document safety and security issues. This includes the licensee determination of what issues are adverse to

safety and security, as well as communication of these issues to the licensee management and to the NRC, if necessary.

Similarly, the CAP must ensure that safety and security issues are evaluated that their significance is classified and that the cause is determined if the issue is of a significant nature. So essentially, issues can be classified as whether significant or just generally adverse to safety and security.

So it could be a condition adverse to safety and security or a significant condition adverse to safety and security. And within those two different classification levels, then there are different actions that are expected.

So, for instance, for a significant condition you would have a more in-depth investigation of the issue, a root cause analysis, and then additional follow-up with the corrective action program to ensure that you've addressed the root causes to preclude repetition. And that feeds into the next element, which is that licensees must develop and implement corrective and preventive actions as appropriate for those safety and security conditions.

And finally, in order for a CAP to be

acceptable it must include a process by which the licensee evaluates the CAP's effectiveness on a regular basis. So that's the general periodic health check of the program.

In addition to identifying the elements of an acceptable corrective action program, the reg guide also discusses the use of the reg guide by licensees and by the NRC staff. Obviously the purpose of the reg guide was to provide the guidance to implement the enforcement policy provisions if licensees choose to take that route.

So licensees may use the reg guide to develop and implement corrective action programs for the purpose of applying Section 2.3.2 of the enforcement policy.

Now in those cases, the staff will use the guidance and the reg guide to support determination that a licensee's corrective action program is adequate, and that's only if the licensee voluntarily requests that information. Also it's important to note that the NRC staff may find acceptable methods that differ from those in the regulatory guide and if the licensee provides those.

And that's what happened for LES, for instance, because they were so close to the mark in

terms of their corrective action program development and implementation and the reg guide wasn't fully prepared at that time, they elected to go ahead and provide the program they had already developed as a license amendment request and we reviewed and approved that program. We used the draft NUREG and the draft reg guide in order to do that review.

In addition to the elements we've already discussed, the reg guide does have four appendices. Appendices A and B provide sample letters that licensees may use to first commit to the CAP elements identified in the regulatory guide, and second, to request inspection of the CAP implementation.

So we tried to make it as easy as possible for licensees, you know, we've provided the guidance, they can commit to it, and we even gave them a letter that they can just fill in the blanks and send it in. So they can't say we didn't go as far as we could to give them an easy implementation process. The onus will be on them obviously to actually implement the program and that's where it gets hard.

(Off microphone comments)

MS. ATACK: That part we don't do.

Appendix D of the reg guide provides a diagram of a sample CAP flow process. So it's just

more of a pictorial demonstration of how the CAP should function.

And finally, Appendix D provides some examples of criteria for assessing the significance of conditions adverse to safety and security and then some examples of situations that could be classified as significant just to give perspective to the licensees who are embarking on developing a program.

Here's a picture of the process to use the regulatory guide, and we've used this at public meetings with licensees to help them understand the approach that they should use if they want to develop a corrective action program either with or without the reg guide.

So the process is initiated when the licensee submits a letter to the NRC committing to Section C of the regulatory guide. And the Section C is the staff regulatory guide and so that's really where those six elements are contained.

So after receiving such a commitment, the staff will amend the license to capture the commitment as a license condition. Alternatively, as we discussed earlier that the licensee may submit an amendment request with a description of their corrective action program in lieu of committing to the

regulatory guide, and then the staff will perform a review of the amendment request, issue any RAIs that are necessary, and then use a safety evaluation report to document our conclusion about the amendment request.

So either way, when the SER is issued or when we receive the letter, we'll document the corrective action program as a license condition. After the license is amended and the licensee has developed and implemented their corrective action program, then we expect that the licensee would notify the NRC in writing that they're ready for us to come out and do an inspection of their CAP implementation.

So it's one of the template letters that we have provided, you know, we're interested in embarking on the program, we commit to the reg guide, and the other one is, okay, we've implemented our program, we're ready for inspection now.

And so we're kind of in the waiting stage between the license commitment and the implementation inspection because we don't want to go out and inspect as soon as we have that license commitment. We want to make sure the licensee has had the opportunity to make sure they've implemented their program effectively and they've had the run time, so that when

we go out and do an inspection it will be a fruitful inspection and we'll be able to assess all of the implementation of their program.

So the inspection step is represented in the third box of the slide and that will be performed, you know, in conjunction with regional inspectors, and it will assess both the implementation of their policies and procedures and the effectiveness of their overall CAP implementation.

So the first inspection is going to be a bit more laborious than subsequent periodic inspections because you have to take that first look at their policies and procedures, and that becomes a little more important when they're just committing to the reg guide in lieu of providing an amendment request. Because the first look you're really going to get at the licensee's development of their program is when you arrive on site for the inspection.

So that's where you'll really see if they've translated those elements of the corrective action program from the reg guide into their implementing policies and procedures.

MEMBER RYAN: Have you given any thought to having a preliminary visit to, you know, try and give them as much chance for success as possible in

the inspection?

MS. ATACK: We haven't thought of that. I know, well, one thing that the industry --

MEMBER RYAN: Let me say why I'm asking this question.

MS. ATACK: Okay.

MEMBER RYAN: If you show up with the full crew to do your first inspection and end up with a bunch of violations, guess what.

MS. ATACK: That's right.

MEMBER RYAN: You're not welcome anymore.

MS. ATACK: They're rethinking whether or not they want to do the program at that point.

MEMBER RYAN: It's a very difficult step for them to take. And if you have some kind of a preliminary assessment step where you could say, look, these nine things are on track, these three or four probably ought to have some additional attention in these areas and we'll come back and inspect the whole works when we come back, you know, kind of like a tutorial visit, that's not a bad idea.

MS. ATACK: And that's one thing that we had -- oh.

MR. FRANOVICH: If I can just make two comments on that. We did have a proposal from

industry to do something similar to that where before they actually make a commitment, can you come out and look under the hood and see if this looks good and tell us where the gaps are between the reg guide and our current program.

And when we thought about that we said, well, first of all, we're not consultants. That's a very important, an obvious statement but important to make that very clear to our licensees. But more importantly, we want them to embrace the concept of an enhanced CAP, and it's much harder to embrace it if a third party is coming in to assess your program than the personnel at the station actually going in and reading the reg guide and actually evaluating for where their gaps are and proposing potential enhancements if they're willing to make the commitment.

So we think, in our view we did not adopt that recommendation from industry or comment because we wanted more buy-in on the licensee's part. The other part --

MEMBER CORRADINI: May I ask about the first part?

MR. FRANOVICH: Yes. Sure.

MEMBER CORRADINI: But to get buy-in, what

Mike is suggesting strikes me as a way to get buy-in so they're not surprised when actually the rubber hits the road they get a violation. At least that's my impression of what --

MEMBER RYAN: That's kind of where I am. I mean in order to get in the licensee's seat --

MR. FRANOVICH: If I can address that, let's take the situation where they've made a commitment and they do have a license condition and then they're in the process of enhancing their program and they say, okay, here's your letter, NRC. We're ready for the inspection. I believe that's more of the scenario of what you're looking at.

We have evaluated or discussed amongst the staff and the management team whether or not to do more of an audit before they would be subject to enforcement action if there are any findings on that first inspection, and for various management reasons it was decided not to go that route.

The preference was if you've made the commitment and you have a license condition, you understand that the program goes live at the point you get the license condition. And that was to help drive more incentive for them to make sure that they've done their own self-assessment and that they truly are

ready to implement such a program.

But there is validity to the other school of thought as well, because we do audit in other programs before we actually issue the license amendment. But it had been discussed, so it's not something new.

MEMBER RYAN: It's still not clear to me why you didn't choose the --

MEMBER CORRADINI: Can you give us more insight as to the management thinking?

MR. FRANOVICH: It comes down to wanting the licensee to do more of a self-assessment and being prepared, ready in saying, our program, we are fully committed to it, and that they're not going to rely on an audit process and then perhaps back out of their commitment afterwards.

So it comes down to that. There isn't a whole lot more. If there were I'd tell you about it, but there really isn't.

MEMBER SCHULTZ: It seems counter to the pilot program that you described earlier. And you also made the comment that wouldn't it be nice if everybody kind of participated in some fashion in the pilot program. Now you're painting a different picture of how it could work in a very forceful and a

regulatory fashion.

MEMBER SKILLMAN: I think another component is you're not spread out over four regions and 100 facilities. You've got six plants and all of the inspections are out of Region II.

MR. FRANOVICH: That's correct.

MEMBER SKILLMAN: And so there is, at least building on Dr. Ryan's comment and then Mike's comment and Steve's, value for the licensees to see a consistency with some kind of a pre-audit or something where you're going to take a look and say, hey, you know, well done for committing to this, here's some things you might want to look at.

I don't think that would cause a licensee to diminish effort or to back away, but it could raise the bar in terms of their willingness to comply because they know they're not going to be surprised with a handful of findings six months from now.

MR. FRANOVICH: Like I said, I believe that is a valid alternative.

MEMBER CORRADINI: So let me ask my last question, just not to belabor the point. So do the licensees get together as a group themselves and talk about what they're doing in these areas?

MS. ATACK: They do. Actually, after

LES's approval they gave at least one presentation. The industry does bi-weekly calls where they kind of discuss operating experience, and LES has spoken to them on at least one regard to talk about their approval process and actually to encourage the other licensees to participate, which to us was highly impressive because LES doesn't participate in the calls to a high degree anyway.

So for them to actually participate in the call and to encourage others to participate in the process and talk about, you know, how the process laid itself out, you know, the inspection, the kind of things we identify and what we looked at, I thought that was very commendable of them. But they do communicate.

MEMBER CORRADINI: Okay, thank you.

MS. ATACK: They talk about us all the time.

MEMBER CORRADINI: Okay.

MS. ATACK: Yes. But one thing I'll add to Mike's comments is in terms of implementing the LES CAP approval, one thing that we did do in inspection space was we did a two-part inspection.

So there was one week of in-office review where we looked at the policies and procedures and

kind of assessed where those were with respect to compliance with the draft NUREG/reg guide criteria, and then the subsequent portion was the onsite inspection.

So I would expect that if we do a similar process for subsequent approvals and we identify that when we are looking at the policies and procedures the licensee is very far away from where they need to be in order for us to really see a successful program, we may say, you know, kind of caucus with them and say, okay, we're seeing a lot of deficiencies in this area where we don't think you're implementing the reg guide criteria. Do you want to revisit those and kind of hit these bullets so that you're making the mark before we come out and do your implementation inspection?

And that may be more of the compromise process that we're able to implement because –

MEMBER RYAN: That sounds like a really good idea because it gives them a chance to have success without, you know, violations rolling in the door.

MS. ATACK: Yes, I think knowing our stakeholders and having had the communications that we've had with them, the come-out-and-take-a-look

process we don't see a high success level with that. Because what the industry communicated to us that really what they were looking for was, I keep my program the way it is, you know, I know I'm doing some elements of CAP right now. You come out and tell me what I need to do to bring it up to the level that it needs to be in order to meet the reg guide.

So to us that's more of a consulting process and that really doesn't agree with the intent of the enhanced corrective action program process, because really it's a process where the licensee is taking ownership and identifying and correcting issues.

So if they don't want to take the ownership to develop the program and actually implement the reg guide criteria, we would have some concerns with their continued implementation of the process. So we really want them to take that initial onus on themselves to develop the program and then we'll assess it. No free rides, unfortunately. We're also a low budget operation.

So now let's talk about current status. The draft reg guide 3044 was issued for public comment on February 12th, 2014. The comment period ended in March, and we did receive one comment letter from NEI.

What we typically see in our area is we have one comment letter from NEI, and what they do is consolidate all of the industry comments into one cohesive document.

So it kind of makes it easier for us. We don't get multiple facets of one comment from numerous stakeholders, we just get one consolidated comment letter and that represents all of the industry positions that we need to address.

So we had a briefing with the ACRS subcommittee on May 7th, and we had some discussion, some fruitful discussion out of that. And currently the reg guide is being routed for final concurrence. What we've seen as a result of the internal concurrence process and the public comments are minor changes and clarifications to the reg guide.

I'll go through a few of those just for discussion purposes. One of the comments that we addressed was that the elements, one of the elements of an acceptable corrective action program obviously is the requirement for licensees to establish a CAP organization, and that organization has to be independent of their reviewing organization and auditable and so they have to be separate from production as well.

And based on a comment from industry, they recommended making sure that it's clear that those independent review duties can be performed by an outside body.

So we added a clarification to the reg guide that identified that the independent review duties of the CAP organization can be performed by a consultant, but however the existing part of the licensee's organization does have to retain overall responsibility for the corrective action program.

We also provided a modification to the definition of nonconformance, whereas in draft reg guide 3044, the nonconformance definition had included a failure to meet contractual requirements. Industry identified that a contract requirement may or may not have a bearing on an item safety or security attributes.

As such, the staff revised the definition of nonconformance to identify that a nonconformance is a deficiency in characteristic documentation or procedure that renders the safety and security attributes of an item unacceptable or indeterminate. So that actually aligned the definition a little bit more with the Appendix B style definitions.

So currently as written, the draft guide

stated that the CAP should include a process for tracking and trending of issues and for reporting these issues to the NRC when required. Industry commented on this statement and stated that it's not the responsibility of the CAP to include a process for reporting of issues.

And they also identified that there may be other processes that perform that function within the existing licensee organization. And staff partially agreed with that comment, and we agree that the CAP doesn't have to be the repository for the process but assesses reportability of issues and makes the appropriate notification.

However, we do maintain that having an effective corrective action program should ensure that these actions are taking place. Obviously, if you have reportable conditions and they're not getting identified, reported and corrected, then there's a deficiency in your corrective action program.

So we made a modification to the language in the reg guide to identify that the CAP should ensure reporting of issues to the NRC when required. So that clarification just makes clear that the CAP doesn't have to include the process for reporting, but it does have to ensure that reporting is being

addressed.

Finally, as a result of comments from the Office of Nuclear Security and Incident Response, we made some additions to the list of examples of significant conditions adverse to safety and security. These changes included adding sabotage of a reportable quantity of special nuclear material as an example of a significant condition due to the applicability to Category I facilities, as well as adding the loss or improper disclosure of classified information as an example of a significant condition, because that is a very relevant issue that we have seen.

Those are some of the more substantive changes that we made between draft reg guide 3044 and the final reg guide. Nothing that significantly changed the direction of the guidance, but a comment resolution table will be made publicly available with issuance of the final reg guide.

So as for next steps, the staff's currently in the process of developing an inspection procedure that we'll use to assess the effectiveness of licensee corrective action programs. We've been having a high level of communication with the regional inspection and management staff to really define those elements of the procedure --

MEMBER BLEY: I assume the folks who look at that for reactors are heavily involved in this development. Is that true?

MS. ATACK: Not heavily involved in it, because, well, I mean some of the regional --

MEMBER BLEY: Even in the Region?

MS. ATACK: -- inspectors, yes. So they will also look at reactor programs. But within headquarters, we didn't go to NRR and NRO and have them look at the procedure. We really focused on the inspection staff and their expertise in the development and fine tuning of the procedure.

We've also reached out to OE, and also we've done some safety culture discussions on how to include safety conscious work environment within the inspection procedure.

And moving forward with the CAP approval and inspection process, what we plan to do is to resolve any comments on the regulatory guide that the subcommittee may have, and also we have OGC review to complete.

And then we hope to issue the reg guide in late June or early July as final, and then we also hope that we will see some licensees who are interested in participation of the program and would

be able to start implementing it in the near future.

So in conclusion, the staff feels that reg guide 3.75 is responsive to stakeholder feedback. We've had a high level of industry engagement in the development process for the guidance, you know, since before we even issued the draft NUREG we had talked to industry about the elements of a corrective action program and what we should see in there.

And as usual they've been quite vocal in telling us areas that they would like to see changes, improvements, clarifications, and we've implemented those as appropriate. And we feel that the reg guide is necessary for regulatory stability and clarity.

We have these provisions in the enforcement policy that allow licensees credit for having an effective corrective action program, but in terms of the staff expectations for what that entails we're devoid of guidance. So that's why we need the reg guide to communicate that to licensees.

And finally, for Kurt, issuance of the reg guide completes Task 1C of the RFCOP project plan so it keeps him on schedule. So that concludes my prepared remarks. I'll now take any questions.

MEMBER SCHULTZ: I have just one comment, Sabrina. I'm glad that you mentioned nuclear safety

culture because I was waiting and waiting and waiting for that to come into view here. It's clearly a key component for an effective corrective action program.

MS. ATACK: It is.

MEMBER SCHULTZ: And so I hope that that's not only brought out in this Phase I, but also a key element as we move into Phase II to ensure that the implementation promotion and sustenance of such a nuclear safety culture within the facilities is promoted.

MS. ATACK: It is. And that's an area where we really pulled on, actually, NRR has some really, really tremendously useful staff in terms of knowledge in this area and they've provided their inspection procedures for guidance and they have qualification cards and training that's recommended.

So those are some things that we're taking in our discussions of the inspection procedure, and then also how we should train inspectors to be prepared on how to assess safety culture or safety conscious work environment when they're on site?

Because we were initially a little hesitant to include it in the inspection procedure because we weren't sure if we were overstepping our boundaries. Because safety culture is a policy, you

know, and it's not really, you know, it's not a requirement. It's not in Part 70 of regulations, and so we felt like we were in a gray area.

And so we had some management discussions and decided that it was okay to include it in the procedure, and then we went about, okay, what the best methodology to include it in the procedure, what kind of questions do we ask, how do we prepare our inspectors in order to ask these questions and get the right answers? You know, what mechanisms do we apply in that space?

So that's where we're coming up to speed now. We've had the procedure developed with some questionnaires included for inspectors to use in asking the safety conscious work environment questions, and we've provided that to NRR for their review and we're having teleconferences and meetings with the Region and with the safety conscious work environment folks to fine-tune that and then to learn how we should train our inspectors to be prepared.

MEMBER SCHULTZ: Thank you.

MEMBER RYAN: All set? Anything else with amendments? Hearing none, thank you folks very much for your presentations this morning. With that I'll turn it back to you, Mr. Chairman.

CHAIRMAN STETKAR: Thank you. Let me take an opportunity. I don't think we have anybody in the room here. I don't know if we have anyone –

(Simultaneous speaking)

CHAIRMAN STETKAR: I don't know if we have anybody on the bridge line.

MS. ATACK: That hurts my feelings. They were there when I started and now they're gone.

CHAIRMAN STETKAR: Do you know if we have anyone on the bridge line? Girija, do you know if we have anyone on the bridge line?

MR. SHUKLA: No, there's nobody there.

CHAIRMAN STETKAR: With that, thanks again to the staff. I appreciate the very informative briefing, and we will recess until 10:45.

(Whereupon, the above-entitled matter went off the record at 10:25 a.m. and resumed at 10:45 a.m.)

CHAIRMAN STETKAR: We are back in session. And the next topic on our agenda is an overview of the SHINE application and Dr. Mike Ryan will lead us through this presentation.

MEMBER RYAN: Thank you very much, Mr. Chairman. I think this is our first briefing on the SHINE?

So we're pleased to have this kind of introductory presentation. I'm Michael Ryan, Chairman of the Radiation Protection Nuclear Material Subcommittee.

This is the first day CRS briefing on SHINE Medical Technologies construction permit application and will include the staff's proposed licensing approach. This will be an information briefing as we are preparing to review the construction permit application I'm expecting this briefing will help us streamline our review.

So to protect information that is proprietary to SHINE a portion of the meeting may need to be closed to the public. I request that committee members refrain from citing any parametric values that are not in the presentation when they ask questions in the public form as the information is proprietary.

If we go into closed session I'll ask that the NRR staff then confirms that only people with due clearance and need to know are in the room. Technicians at the booth will disconnect telephone bridge line that was open to the public and dial into the line reserved for closed portion of the meeting.

Unless any of that ACRS members want to say something first I will invite Mr. Lawrence

Kokajko, Director of Division of Policy and Rulemaking in NRR to introduce his staff and start the briefing. Are there any questions from members or observations for us about the meeting?

MEMBER CORRADINI: Mr. Chairman? I have institutional conflict of interest since Wisconsin is supportive by Morgridge Institute of Research which was part of Phase 1 of this work.

MEMBER RYAN: Okay. Anybody else?

MEMBER CORRADINI: So we won't hear anything from you, sir.

MEMBER RYAN: Very good. Without further ado I'll ask our presenters to being their presentations. Gentlemen, welcome.

MR. KOKAJKO: Thank you very much, we're very happy to be here. Again, my name is Lawrence Kokajko, I am the Director of Division of Policy and Rulemaking in the Office of Nuclear Reactor Regulation.

And on my right is Alexander Adams, he's our chief of the Licensing Branch for the RTR Program. And our project manager to my left is Steven Lynch.

I predict you're going to hear a lot more from Steve in the coming years. He's one of your hires a few years ago and he has been a great addition

to our staff and he has been a whirlwind as a project manager on this particular project.

The purpose of this meeting today is to provide an informational briefing to you on the proposed direct final rule which would add the SHINE Medical Technologies Radiation units to the definition of the utilization facility in 10 CFR Section 50.2.

One of the things that I like about this particular job is the fact that the mission and the humanitarian goals of what our agency does are very clear.

Production of medical isotopes is a worldwide concern and it is reaching critical proportions in this country as well as elsewhere. And this will help us to achieve that goal provided that it is done safely and effectively.

Staff received its first construction permit application for medical isotope production facility from SHINE in the spring of 2013. SHINE has proposed to construct eight sub-critical irradiation units to fission liquid uranium for the production of moly-99 using an accelerator based technology.

Based upon our early technical evaluation of the construction permit application, we determined that the regulations for the utilization facilities

under Part 50 provided the most appropriate, efficient and effective licensing process for the SHINE irradiation units.

However, while we believe it's within NRC's authority to designate the proposed irradiation units as a utilization facility under the Atomic Energy Act, the irradiation units do not meet the current the definition of a utilization facility in Section 10 CFR, Section 50.2.

To address this issue the staff has recommended the publication of a direct final rule and companion proposed rule. The rule would add SHINE's irradiation units to the definition of utilization facility. And this change would allow the NRC staff to apply the most appropriate licensing and technical review standards to the SHINE irradiation units, meet review milestones and ultimately make a final determination to either grant or deny a construction permit and, if requested in the future, an operating license for the SHINE facility.

The rule would also clarify the appropriate regulatory requirements to SHINE, interested members of the public, federal, state, local and tribal government representatives and other interested stakeholders.

The staff has prepared a SECY paper recommending this rulemaking to the Commission and it has currently undergone interoffice review by all the major program offices, including OUC. It is currently undergoing a final review in the EDO's office.

The staff appreciates this opportunity to present our proposed licensing approach and looks forward to continued engagement with the ACRS over the course of this review. As well as, as we proceed on this and perhaps other construction permit applications.

At this time I'd like to turn it over to Al Adams for his remarks --

MR. ADAMS: Sure.

MR. KOKAJKO: -- and then to Steve Lynch.

MEMBER BLEY: Lawrence, before you do that.

MR. KOKAJKO: Yes, sir.

MEMBER BLEY: I'm not familiar with a direct final rule process, can you just say something about that process, what it is?

MR. KOKAJKO: Yes, sir. In essence we can go with a direct final rule if we believe a rule is going to be typically noncontroversial. However, because we had done so without public engagement we

also at the same time issue a proposed rule. And the proposed rule --

MEMBER BLEY: Okay.

MR. KOKAJKO: -- if there are public comments, we would get it on the proposed rule.

MEMBER BLEY: Okay, and that's the normal advance notice?

MR. KOKAJKO: That's the normal advance notice.

MEMBER BLEY: Okay.

MR. KOKAJKO: If, there are now some direct final rules that go out on cask certifications under 10 CFR Part 72.

MEMBER BLEY: Yes.

MR. KOKAJKO: This is one that we think would be noncontroversial and we would amend the definition. And we don't expect anyone to be bothered by it or complain or otherwise --

MEMBER BLEY: Okay.

MR. KOKAJKO: -- object to it.

MEMBER BLEY: Thanks.

MR. ADAMS: Well --

CHAIRMAN STETKAR: Al?

MR. ADAMS: Good morning, we're glad to be here. I just wanted to make few historical remarks

that essentially we're here today because of old age and that's the old age of foreign research reactors that produce moly-99.

As you're aware several years back two of the reactors that produced a significant percentage of the world's supply of moly-99 both entered unscheduled complex maintenance outages at the same time that had a long duration. This resulted in a worldwide shortage of moly-99 and also a wake-up call to a lot of people.

At that time NRC and DOE, NNSA did work to see if we could come up with a short term solution for the issue of irradiating the targets that were designed for the Canadian NRU reactor and U.S. research and test reactors, but a workable technical path could not be developed at that time.

So this lead to the fact the fragile nature of the moly-99 supply became a U.S. Government issue.

DOE and NNSA took the lead to establish a reliable diverse supply of moly-99 based on low enriched uranium technology. As part of that effort, DOE and NNSA entered into a number of cooperative agreements with interested parties to spur the development of domestic moly-99 production capability.

One of these agreements lead to the construction permit application from Shine Medical Isotopes to construct a facility to produce moly-99 that we're going to discuss today. While parts of SHINE's technologies are familiar, the staff have never seen these parts put together this way before.

We had an issue were the accelerator driven subcritical operating assembly did not fit into the existing regulatory framework. It possessed the attributes of the liquid homogeneous research reactor, but was not a reactor.

After a large amount of brainstorming, and a significant assistance from the Office of the General Counsel, a legal path forward was developed that you will hear about today.

I wish to thank OGC for their continuous support and close working relationship that has been forged on this project. We wouldn't be talking to you today without their close support.

Also would like to thank Steve Lynch, the PM for the SHINE review, who worked tirelessly to get us to where we are today. With that I'd like to turn it over to Steve to discuss the SECY paper that's now with the EDO.

MR. LYNCH: Great, thank you, Alan

Lawrence, for your introductions. And we are glad to be here to start engaging with the ACRS with respect to SHINE early in our review process to help get everyone familiar with this technology because there's a lot to think about with this.

And before I get into the presentation I do want to say that our entire, all of the slides we have prepared contain only publicly available information. We only anticipate discussing proprietary information if we need to respond in such a way to questions we are asked today.

So to get started. The purpose, the reason why we're here, is to discuss the SECY paper that proposes the staff's licensing approach to the SHINE irradiation units. This paper is recommending the issuance of a direct final rule that would redefine utilization facility in 10 CFR Part 50 to include SHINE's irradiation units.

We believe that this is most appropriate given SHINE's unique design and operation and having this will allow us to implement the most appropriate licensing and technical review standards, conduct an efficient review of the application, as well as clarify appropriate regulatory requirements to stakeholders, including SHINE and members of the

public as well as local and state government agencies.

So to get a little bit more into this issue, we have received a construction permit application from SHINE. They've requested to construct irradiation units that will produce molybdenum-99 through uranium fission. And this will be a liquid uranium solution that they will be using.

And what's unique, most unique about this design and what's given us the most to ponder over, as far as how we want to license this, is the fact that these irradiation units will remain subcritical under all conditions. Because of this we've had to think about, well what are these.

And given current definitions we've looked at and couldn't find the right box for them. Though we do believe the most appropriate safety and licensing considerations for these irradiation units are those that are most similar to non-power reactors.

However --

MEMBER RYAN: Steven, just a --

MR. LYNCH: Yes.

MEMBER RYAN: -- follow up on the second dash bullet there. Remain subcritical on all conditions. I guess, what's all?

MR. LYNCH: All means, I guess under

standard operating conditions and accident conditions SHINE has proposing a --

MEMBER RYAN: What's the range of accidents you're looking at? Standard I understand, there's no problem there I guess. But I mean, you know, you can look at a wide range of accidents including catastrophic failure due to earthquake or, you know, all kinds of stuff. How far did you --

MR. LYNCH: So we're --

MEMBER RYAN: -- include it all?

MR. LYNCH: We're currently evaluating SHINE's proposal. But from what they have given to us in their construction permit application, on there they have said that there is possible accident that could result in them going critical.

MEMBER RYAN: Okay.

MR. LYNCH: We are still evaluating that. We've engaged --

MEMBER RYAN: Fair enough.

MR. LYNCH: We've engaged the Office and Research and we're performing confirmatory calculations to see if we agree with what they've proposed.

MEMBER RYAN: That's, their view at this point is criticality cannot happen?

MR. LYNCH: Correct.

MEMBER RYAN: Okay.

MR. LYNCH: And what this means is that because they are not critical, they are not a nuclear reactor. Because part of the definition of being a nuclear reactor means you are able to maintain criticality.

So that means that we can't license them as a utilization facility. Which is what all current reactors are licensed as. However -- yes?

MEMBER BLEY: How complete is the design at this point? Is it, you have information on how they add uranium to the solution and that sort of thing? The processes.

MR. LYNCH: We've got the general outline of how they, of their general preparation. So right now SHINE is, they're going with the traditional part, what they have submitted us a traditional Part 50 application where we have a construction permit and that will be followed by an operating license application.

There are aspects of their application that they believe they do not need to fully have flushed out until their operating license and we're evaluating that. We've communicated to them that we

believe it's in their best interest to give us as much information as they can early in the process because information that they believe can wait until their operating license, you know, that's a significant risk they take if we determine that, you know, the information they haven't provided, you know, until their operating license application maybe not be acceptable. They may need to go back and redesign.

MR. ADAMS: They're in the stage where they are still doing, you know, research and development in some areas. They have the general design pinned down.

But in some cases the application has, you know, measurements. And a lot of times the word about is in front of the measurements. So it is still work in progress to some extent? It is.

One of the, you know, determinations we have to make is that there's enough there and there's enough detail there to issue a construction permit that what's, you know, that what's not there is more in line with an operating license.

For example, you know, we believe that their I&C system will be digital but in a construction permit stage there's no discussion of the V&V that went into design and all that.

MEMBER BLEY: Now the thing that I was just thinking about, their claim that it can never go critical which seems to at least hinge to some extent on how they feed uranium into the system.

MR. LYNCH: Correct.

MEMBER BLEY: And if you don't see that you wouldn't be able --

MR. LYNCH: Right.

MEMBER BLEY: -- to dream up accidents or oddball things that could --

MR. LYNCH: And that's one of their controls of criticality is their fill volume of their tank.

MEMBER BLEY: Yes.

MR. LYNCH: And how they prepare, you know, and I've got a slide on that in a little bit about --

MEMBER BLEY: Okay.

MR. LYNCH: -- on all their criticality controls.

MEMBER SKILLMAN: Steven let me ask this question please.

MR. LYNCH: Yes.

MEMBER SKILLMAN: What is the qualification basis for the people on the staff that

are doing the review? Particularly relating to reactivity and moderated temperature coefficient and that type of things.

MR. LYNCH: We have, so we have a lot of people engaged in this review. As far as that, the criticality aspects go, we've engaged the Office of Research and their experts. I think we have a few of them in the room here today with us and they are working on developing some confirmatory codes to validate SHINE's claims in their application.

MEMBER SKILLMAN: Thank you.

MR. LYNCH: Okay. So just a quick overview of what SHINE has given us. We've received their construction permit application in two parts about a year a year ago. And the two main parts of this application were their environmental report and their preliminary safety analysis report.

And in this application there are two distinct processes that will be going on in the SHINE facility. Most of what I'm talking about today will be their irradiation facility which consists of their eight irradiation units that will be irradiating the liquid uranium.

The second main component of their facility will be what they're calling their

radioisotope production facility. This is the facility that will consist of three hot cell structures where the liquid uranium will be piped over to and the molybdenum-99 will be chemically separated out of. And then the remaining uranium solution will be then sent back to the irradiation units.

And this facility has been proposed to be constructed in Janesville, Wisconsin.

CHAIRMAN STETKAR: Steve?

MR. LYNCH: Yes.

CHAIRMAN STETKAR: I haven't looked at the PSAR but in recognizing that Part 50 doesn't require the performance of risk assessments, have they, has the applicant indicated whether or not they are going to have an integrated risk assessment for this facility?

It sort of hinges on some of our previous questions about this notion of the impossibility of criticality or the scope of accidents that might be evaluated.

MR. LYNCH: I guess maybe this is my term, but by risk are you talking more they looking at this from a deterministic versus probabilistic?

CHAIRMAN STETKAR: Probabilistic risk assessment.

MR. LYNCH: Yes. At this time they do not intent to do that. They're following the guidance that we have provided. They're generally following NUREG-1537, which is our standard review plan for non-power reactors. And at this time they do not intend to do that.

CHAIRMAN STETKAR: Thank you.

MR. ADAMS: Add that, you know, there's sort of two halves to this facility. There's these irradiation units and then there's the part of the facility where the moly-99 is separated from the fission products, which is by the regulations. That's clearly a production facility.

NMSS is the lead technical folks looking at that part of the facility and taking their, you know, their traditional approach to looking at that part of the facility. Because the standard Part 70 criticality concerns are more the protocol.

CHAIRMAN STETKAR: So in effect that part of the facility as you've characterized it would be subject to requirement for at least an integrated safety assessment? ISA.

MR. ADAMS: Mary? Mary is nodding her head, so the answer is yes. It's the Part 50 facility, the most appropriate technical yardstick is

the Part 70 approach to it. And the irradiation facilities, the most appropriate yardstick is the sort of research reactor approach.

When we rewrote NUREG-1537 to add a interim staff guidance for these medical facilities, again NMSS was instrumental and did a lot of the drafting of that information.

CHAIRMAN STETKAR: I know we don't have much information about the design and we can't go into details about anything that's available, certainly not in an open session at this time. But you've characterized it as two parts of the facility. It's probably not quite that simple, at least from things like power supplies and support systems and integrated control systems and stuff like that. So it may not be quite as separable in the world of risk.

MR. LYNCH: Yes. I mean definitely, you know, we do have to, when we are evaluating this we are looking at the impacts all of these can have on each other. It's just for simplicity on, for the purposes of this, but yes.

CHAIRMAN STETKAR: Sure, okay. Thank you.

MEMBER SKILLMAN: One more question.

MR. LYNCH: Yes.

MEMBER SKILLMAN: For the location in

Janesville, or anywhere this facility could be located, what is the requirement for the environmental impact statement?

MR. LYNCH: So we are preparing an environmental impact statement for, as far as the regulations go an environmental impact statements was not required. However, our environmental staff determined that since this is a first of a kind facility it would be most appropriate to prepare an environmental impact statement, so we are in the process of doing that right now.

MEMBER SKILLMAN: Thank you.

MR. LYNCH: Okay, now to get a little more technical here, just a quick explanation and infographic on the SHINE irradiation unit.

So each, the three main components of these irradiation units are neutron driver or accelerator. The target solution vessel that will contain SHINE's uranium solution. And then the target solution vessel will be surrounded by a light water pool.

And then the main mechanism for controlling reactivity will be a combination of administrative and engineered controls. These will include the fill volume and how they fill the target

solution vessel, the concentration of uranium in the solution, the enrichment of uranium that is being used and then temperature and pressure.

So here's what SHINE has asked for. They have submitted a construction permit application requesting a single construction permit for a production facility, as defined in 10 CFR Part 50. And the reason they have done this is based on guidance that the NRC staff provided.

In October of 2012 we issued interim staff guidance augmenting our standard review plan for non-power reactors to include additional guidance for aqueous homogeneous reactors and radioisotope production facilities.

And at the time, as we preparing this guidance, we thought that facilities like SHINE could be, the irradiation units, could be joined and licensed with the radioisotope production facility as a single production facility.

Now that we have the application and we've studied SHINE's licensing proposal a little bit closer, we understand that the irradiation units operate independently of the radioisotope production facility. And also these irradiation units do not meet our definitions of a production facility.

We've also, since we've realized that the irradiation units don't meet the definition of a production facility or a utilization facility, we also considered 10 CFR Part 70 as a way of licensing the irradiation units and saw that they are not consistent in their design with more tradition fuel cycle facilities.

That being said, for the part of SHINE's facility that, the radioisotope facility, we do see that as meeting the definition of production facility in 10 CFR as requested by SHINE.

So really the only, like half of this facility, the radioisotope production facility, we agree with SHINE's licensing action request. We'll review that as a production facility. So it's only the irradiation facility that we are trying to find the correct licensing approach for.

So I've been talking a lot about utilization facilities, production facilities and reactors. Just to get a better idea of why we believe SHINE doesn't fit into our existing regulations I just want to kind of quickly go through the definitions that we have.

So in 10 CFR Part 50 deals with the licensing of production and utilization facilities.

Looking at the definition of utilization facility we see that a utilization facility is basically a nuclear reactor other than one designed or used primarily for the formation of plutonium or uranium-233.

If we look at what a nuclear reactor is we see that it's an apparatus, other than an atomic weapon, designed or used to sustain nuclear fission in a self-supporting chain reaction. So since SHINE intends to remain subcritical, they do not meet the definition of a nuclear reactor and therefore cannot be a utilization facility.

So we looked at, well since they can't be a utilization facility could they be a production facility? There are three parts to the definition of a production facility.

The first is a nuclear reactor designed or used primary for the formation of plutonium or u-233. Well we've established that SHINE is not a nuclear reactor and also their facility will not be used primarily for the formation of plutonium or u-233. So the first definition is out.

The second definition here we have, a facility designed or used for the separation of the isotopes of plutonium. SHINE will also not be performing this activity in their irradiation units so

we cannot apply the second definition.

And then we come to the third definition. Any facility designed or used for the processing of irradiated materials containing special nuclear material.

I'm going to get into a little bit more detail in the next slide about the NRC staff's view on processing, but we don't believe that this definition applies to SHINE's irradiation units either.

However, I should mention that it's this third definition that we believe their radioisotope production facility falls under for their processing and separation of molybdenum-99 out of the uranium solution.

So looking a little more carefully at the processing of irradiated materials. So while processing is not defined in the Atomic Energy Act or 10 CFR, the staff believes the processing does not include the irradiation and fission of materials containing special nuclear material.

SHINE's target solution can be roughly made analogous to the treatment of reactor fuel. Just like reactors they will irradiate their target solution for a time in their target solution vessel, will be piped over to their radioisotope production

for some time and then brought back into the irradiation units.

And this is very similar to a reactor that will have its fuel irradiated under operation. When the reactor goes unto an outage, some of the fuel maybe taken out and then will be put back in.

MEMBER RYAN: Steven, there's two process there and the reactor part I kind of understand. You've got a solution reactor --

MR. LYNCH: Yes.

MEMBER RYAN: -- and that's a fairly stable thing while it's operating. But now you've going to take that same liquid and go over here and take the, you know, medical radionuclides and other radionuclides of interest out of it. So you're processing that liquid in some global way.

I guess that's the part that intrigues me in terms of, is there any yet unidentified or yet something to consider in terms of the risk of a criticality on that side of the --

MR. LYNCH: As far as what SHINE has told us in their application, they have said that that side of their facility is criticality safe by geometry so that --

MEMBER RYAN: So unless the geometry

changes you're okay?

MR. LYNCH: Correct.

MEMBER RYAN: So what can change the geometry? I'm just trying to think, you know, out loud in a way trying to just --

MR. ADAMS: So the safety approach on that part of the facility is closer, akin to the normal Part 70 process is what they look at.

MEMBER RYAN: Okay.

MR. ADAMS: So you know, yes sure earthquakes, plates breaking --

MEMBER RYAN: All that's in play on that side of the facility?

MR. ADAMS: Yes.

MEMBER RYAN: Okay.

MR. ADAMS: Yes, that side, the margins to criticality are different because they're not, you know, they're not trying to cause fission to occur, they're just, you know, they're handling this liquid which --

MEMBER RYAN: Right. But I'm thinking about things like a chemical change that causes a precipitation and --

MR. ADAMS: Yes.

MEMBER RYAN: -- and all sorts of things

like that can happen and --

MR. ADAMS: Yes, and --

MEMBER RYAN: -- change pretty significantly.

MR. ADAMS: Sure. I mean that's, you know, when you go back and look at, you know, what we looked at in the safety of the liquid homogenous reactors and the NRC has licensed about a dozen research reactor --

MEMBER RYAN: Yes.

MR. ADAMS: -- liquid homogenous research reactors over the years, sure, the precipitation of the uranium amount of solution is suddenly is one of the standard things you look at.

MEMBER RYAN: Yes.

MR. ADAMS: And does that create some criticality geometry problems. Sure.

MEMBER RYAN: Okay, so that's, I mean that's something clearly there's experience within the Agency on and something that you plan to evaluate those kinds of excursions, whatever you want to call them, on --

MR. ADAMS: Right. When we started this at, you know, there was a number of letters of intent came in and one of those was from BMW to actually

build several liquid homogenous reactors to produce moly-99. And based on a possibility of that happening, we went to the Office of Research who put together an international panel of experts who drafted interim staff guidance on licensing liquid homogenous reactors.

When we originally wrote NUREG-1537 in 1996, all the liquid homogenous reactors were gone. So we only wrote 1537 for the existing reactors, which at that point was solid homogenous reactors, DAGM.

So there is a whole set of potential accidents that are unique to a liquid system that research developed for us in the ISG and that's, you know, those are the accidents that we will look at as we look at the irradiation facility.

MEMBER RYAN: And I guess at some point during that process of implementing those evaluations you'll have to say enough is enough or we need to do these three or four things more or that kind of thing. Have an iteration step I'm going to guess where --

MR. ADAMS: Yes, I mean we're --

MEMBER RYAN: -- you decide you're done or not.

MR. ADAMS: We're right at that beginning of that.

MEMBER RYAN: Sure and I appreciate that.

MR. ADAMS: You know, Step 1 was get the right yardstick, get the right box.

MEMBER RYAN: Yes.

MR. ADAMS: Once we figure that out now it's, you know, apply that yardstick.

MEMBER RYAN: Fair enough. Thank you.

MEMBER BLEY: Quick question. On the irradiation unit side you have a batch process.

MR. LYNCH: Yes.

MEMBER BLEY: They fill up a pot, irradiate it, dump it out. On the chemical processing side, is it still a batch process or does that all get put together? You know, all of those batches from the irradiation units end up in some kind of tank and get processed or?

MR. LYNCH: I would have to, I'm not sure if that's discussed explicitly in the application, I can go back and look at that.

MEMBER BLEY: You don't know if it's a continuous chemical process or if it's --

MR. LYNCH: I'm not sure if the batches from the different irradiation units will be mixed together.

MEMBER BLEY: Yes, that's what I was

asking.

MR. LYNCH: I don't, I'm not sure.

MEMBER BLEY: Okay.

MR. LYNCH: I really would have to go back and look.

MEMBER BLEY: Okay.

MR. ADAMS: My gut feeling from the discussions that we had is that they, is that they run, out of these eight units they run them on different time schedules for that. You know, for that they meet the demand for it. And that normally the processing will be one irradiation unit gets processed at a time.

MEMBER BLEY: It would still be a batch process?

MR. ADAMS: It's still a, yes, it's still a batch process.

MEMBER BLEY: Okay.

MR. LYNCH: Okay. And then just to finish up on this slide, so kind of put the, our comparison to existing utilization facilities, all reactors and their fuel goes under irradiation and fission. And we don't consider that processing of irradiated materials otherwise all of our existing reactors would be classified as production facilities.

So we ruled out 10 CFR Part 50 from, you know, existing definitions being able to apply to the SHINE irradiation units.

So looking at Part 70 we've also, the staff has determined that licensing the irradiation units as fuel cycle facilities is not recommended. And that's primarily based on SHINE's proposed operating K effective.

So with most fuel cycle facilities they are designed to maintain a significant margin of sub-criticality. And typically that margin is .05 or a K effective of .95.

Smaller margins can be approved on a case by case basis and there is guidance for this. But the SHINE's propose, and this I should mention is even under accident conditions.

SHINE's routine operating margin of sub-criticality challenges what we have reviewed in the past and we do not believe, you know, working with NMSS that Part 70 is appropriate in this case and would set precedents that are inappropriate for existing licensees.

However, that being said, SHINE will need a Part 70 license for the material that they possess in order to, you know, to receive, possess or use

special nuclear material. And that's one of the differences between Part 50 and Part 70.

Part 50 strictly deals with the licensing of facilities where Part 70 has provisions for licensing either, and part, either facilities or material. So while we don't think Part 70 is a best way to use the regulations to apply to SHINE's facility, we think it, and know that it will be applied for the material that they possess.

So after we've decided that the existing licensing frameworks were not appropriate for SHINE, we decided that it was best to look at the technical aspects of SHINE's proposal to figure out where the best place for them to be would be.

And as we've begun looking at the SHINE application we've come to realize and appreciate that these irradiation units operate very similarly to non-power reactors. You know, they operate at thermopower level comparable to liquid homogenous and non-power reactors typically licensed under 10 CFR Part 50. Existing research reactors, operate at power levels between 5 watts and 20 megawatts. And consequently, you know, the safety considerations from operating in this power level range are very similar to existing reactors or past reactors that the NRC has licensed.

SHINE will have to deal with fission heat removal, decay heat, reactivity feedback, fission gas release, radiolytic decomposition of water, fission product buildup and accident scenarios like loss of coolant accidents, reactivity additions and the release of fission products.

So given these safety considerations we decided that, you know, SHINE really looks like a utilization facility. And we needed to figure out the best way to bring them under this umbrella.

So we went and consulted the Atomic Energy Act to see what it had to say on the matter. And the Atomic Energy Act provides a much more broad definition of utilization facility than we have in 10 CFR Part 50.

Of particular interest is this first definition of utilization facility in AEA. It defines utilization facility as, any equipment or device, except an atomic weapon, determined by rule of the Commission to be capable of making use of special nuclear material in such quantity as to be significant to the common defense and security or in such manner as to effect the health and safety of the public.

So here, the key words in here are determined by rule of the Commission. So the Atomic

Energy Act has given the Commission authority to determine what constitutes a utilization facility. and this includes determining that SHINE's irradiation units would be utilization facilities in 10 CFR Part 50.

So with this, our proposal is a direct final rule that would be modify the definition of utilization facility in 10 CFR part 50 to include SHINE's irradiation units. So here I have included our proposed changed to the regulation.

The first part here is exactly what's printed in 10 CFR 50.2 right now. Any nuclear reactor, other than one designed or used primarily for the formation of plutonium or u-233.

And we would like to add, an accelerator driven subcritical operating assemble used for the irradiation of materials containing special nuclear material and described in the application assigned Docket Number 50-608.

So we are getting, we're very specific with this definition. I've been speaking a lot about SHINE's irradiation units and that is, you know, kind of the layman's term for what these are and this is what they say in their application.

But to get a little bit more specific on

the technology, and this is how they define their irradiation units in their application as accelerator driven subcritical operating assemblies.

So here, to make this rule specific we wanted to talk about what the technology is, what it's used for, and these, they will be irradiating liquid uranium, and we also want to limit the applicability of this just to SHINE by including the docket number here.

MR. ADAMS: And I'll point out, we spent an awful lot of time coming up definitions and then determining how there could be unintended consequences to those definitions. You know, people with Kaman neutron generators and, you know, a microgram of uranium at the end of that generator. We were very concerned about inadvertently bringing somebody in that we didn't want to have there.

So that's why this definition is so specific and points at SHINE and nobody else. And we're not aware of anybody else interested in this technology approach to producing medical isotopes.

MEMBER SKILLMAN: Let me ask this. I'm favorable to the idea of making this definition as laser-specific as you have, but I'm wondering if the real unintended consequences by being so specific you

actually exonerate SHINE from being required to fulfil other requirements that another reactor, say a pool reactor applicant, might wish to have.

Such as, and I'm not suggesting this device has to be ASME Section 3 or 8 or anything like that, but it must be designed and constructed responsibly under codes that are well understood. The process systems must be designed in a way that good engineering people understand is safe and effective.

Must have the right controls, must have the right protections since this will be basically a part, it will be somewhat like a Part 70 license. It will probably have IROFS instead of safety equipment.

MR. ADAMS: Well, okay --

MEMBER SKILLMAN: All I'm saying is, is this definition so specific that it exonerates the SHINE application from a greater body of recognized codes and standards that should be used?

MR. ADAMS: We don't believe so. You know, your one question, for example, that the attributes of Part 70 are being translated into Part 50. You know IROFS will become technical specifications.

Again, the approach we're taking is similar to a research reactor. And the regulations do

treat research reactors different than power reactors. And, you know, and given the safety significant of what we have here.

We're looking at appropriate, you know, codes and standards. But for example, 50.55(a) does not apply to research reactors. The GDCs do not apply to the research reactors.

That's one of the things that we looked at is, what regulations apply to utilization facilities. And we allow the option where we see a gap to either by license condition or other methodology, make sure that SHINE does what they need to do to ensure appropriate safety.

MR. KOKAJKO: You know, we've had a lot of help when we crafted this and we did look though a lot of other options to see how we might do this. And in fact there was one comment during the interoffice review that came up over and over.

It's just this one. Is this being laser-specific, is that going to create a problem. And we consulted with general counsel over and over again about this and we still believe this is the best approach for this.

We are also highly aware of unintended consequences. And we still have other regulatory

means that if found something we could correct it.

So we feel this is the best approach for this amendment to the regulations in order to enable the licensing of SHINE under Part 50.

MEMBER RYAN: Lawrence, this may be an unfair question at this stage of the game but I've been thinking about so I'll ask it.

You look at the reactor part of it and look at the rest of it, which is the processing of the liquid and taking the radioactive material on out and putting the other stuff back somewhere else, I guess to me it raises the question, which part of that is going to be the most risk significant?

Because when you're handling the liquids with lots of radioactive material in it, lots of bad stuff can happen. At least nasty, dirty, you know, let's cleanup this mess for a million dollars kind of stuff.

So I guess all I'm suggesting is we're focused right, at this early stage to in, our thinking about the reactor itself, which is not exactly a reactor because it doesn't go critical. You know, we go to make sure we kind of maintain the balance of all risks and in perspective and kind of go with that.

Does that make sense to you guys who've

been studying this for awhile --

MEMBER SKILLMAN: Mike, that's why I made the comment. If this is so specific it exonerates requirements, which we would not perhaps want to have SHINE exonerated from --

MEMBER RYAN: I got a couple of smiles that said they agreed with maybe what I was saying. But I'm not --

MR. KOKAJKO: Yes, we do not believe it's going to exonerate them from any requirements. But if it did, we have regulatory methods that we can bring things to clear that up.

We, by the way, I'm glad you characterized it as a bit unfair question at the beginning because we're still looking at this. You know, the environmental impact statement has started. The technical review has started. We have staff from NMSS research as well as NRR working on it and we have a lot of questions still.

MEMBER RYAN: Well at this stage it's good to know you're sensitized to those kind of issues.

MR. KOKAJKO: We're very sensitized.

MEMBER RYAN: That's really a positive thing from my perspective, so.

MR. KOKAJKO: We're very sensitized. And

in fact I think this has been the benefit of the interoffice communication as to it only enhances communication and continues to identify the issues that we need to address for this because it is a unique application.

MR. ADAMS: We're here focusing on this half of the facility because of the legal issues it presents. That doesn't mean the other half of the facility, you know, that one we know legally what we're doing and technically what we're doing, you know, it doesn't mean because we're not talking about it that, you know, we're underplaying or don't understand the risks there.

You know, this SHINE irradiation facility, you know, another gallon of liquid and a couple of control rods and it's a reactor. And there, you know, then you would be in Part 50 and all these regulations would apply.

If we cross out, you know, Docket Number 5608, we're still in the same place. We just have a description of this irradiation facility.

So it's another way of answering your question that we're only being laser-specific to prevent unintended people from coming in. If we got rid of the 5608 we would still be in the same place as

far as the regulatory process we're following.

In fact, the process is, for Part 50, is a little bit more rigorous than a Part 70 in that Part 50 we're required to come and meet with you gentlemen. There's a mandatory hearing versus a hearing, you know, hearing if someone requests leave for intervene.

So it's, you know, the processes are a little different but it's, again, when you keeping focusing on that this is, you know, from a safety point of view it looks like a research, a liquid homogenous research reactor.

MR. KOKAJKO: If I could add that the goal here is to increase regulatory certainty. To understand our regulatory framework as best as can at this time.

MEMBER SKILLMAN: Thank you. Yes?

MR. LYNCH: One last thing. As far as, one thing that this definition does, so we're pulling them into utilization facility.

And actually by doing this we are applying a, the first paragraph of 50.55(a). Which says that the facility must be designed to all appropriate codes and standards.

So as far as codes and standards go, if anything we're, by doing this, we're making sure that

they use all appropriate codes and standards. So we're actually making that a little bit more certain than it was before.

So just a few comments on the use of a direct final rule. We believe that this most appropriate because we don't think this rulemaking will be controversial.

And the reasons we think this are is that it's, the proposed rule making is consistent with the Atomic Energy Act definition of utilization facility. This rule will allow the NRC staff to apply the most appropriate licensing and technical review standards. And then the limited scope only effects the irradiation units proposed by SHINE.

We also, you know, one of the other reasons for using a direct final rule is we see this also as unlikely to see a significant adverse comments. And a significant adverse comment is a comment that we would receive on our rulemaking from the public that would force us to go back and reevaluate our thinking.

I believe the staff has been extremely comprehensive in our SECY paper and I don't think there is re-analysis that will need to be done. And that being said, you know, as far as out of the scope,

just because someone doesn't like SHINE or has safety or environment concerns related to the SHINE application, those would not be considered significant adverse comments because they are not directly related to the rulemaking and we can address those concerns in a hearing form separate from this rulemaking.

MR. ADAMS: Now there's still will be ample opportunity for anyone who has a comment on the license, you know, the technical yardstick so to speak in the licensing process. So this rulemaking does not take away any person's hearing right to object to the facility. It just gives us a path on how to, you know, how to do the licensing.

MR. LYNCH: And this rulemaking also alliance with the objections of the American Medical Isotopes Production Act of 2012. Or meet, this was part of the National Defense Authorization Act for fiscal year 2013.

And what this Act did was it encourage the domestic production of molybdenum-99 for medical uses without highly enriched uranium.

The benefits that we get from this rulemaking, the NRC would have exclusive jurisdiction over the SHINE facility, including the licensing and oversight of the accelerators associated with the

irradiation units.

Why this is significant, typically accelerators, if it was the accelerator by itself without any of the rest of this, would fall under agreement state jurisdiction. Agreement state's typically regulate accelerators.

But with our proposal the accelerator that SHINE will be using with this irradiation unit would be part of the irradiation. It's part of the irradiation unit and considered, the entire structure itself, as a utilization facility. And the NRC cannot relinquish jurisdiction over utilization facilities.

10 CFR Part 50 provides the most appropriate and efficient licensing and technical review process for our review. And, you know, we also see this rulemaking as not posing a significant impact on the application SHINE has already submitted for our review.

And SHINE has requested a construction permit for a production facility. And being Part 50, the requirements for a production facility versus a utilization facility, at least at the construction permit stage, are very, very similar.

So we do not see SHINE needing to supplement their application with much additional

information. The majority of what they need for us to review is already there.

So going forward, just to give you an idea of where we are with our paper and the SHINE review and what's coming up next, our SECY paper, we've been working on this for awhile. We've received interoffice concurrence from NMSS, FSME, NSIR, NRR and we've gotten our no legal objection from OGC.

So the paper is now with the EDO's office. We have previously briefed the EDO's office on this and didn't receive any push back, so it is with them for their final review and concurrence. It went up to them towards the end of last week, so we're expecting their review to be completed on this soon and to be sent up to the Commission.

MR. ADAMS: We also have briefed the Commission TAs on this paper.

MR. LYNCH: As far as the SHINE review itself, we've been going forward with that as we can in parallel with the development of this paper. As I mentioned earlier, we do plan to prepare an environmental impact statement and the staff is drafting this right now.

And in support of this we've conducted two public scoping meetings in Janesville and a site

audit. Those were both in July and August of last year respectively and those are in support of the development of an environmental impact statement.

As far as the review of the preliminary safety analysis report, we are in the process of developing our initial set of requests for additional information and hope to have those ready for SHINE to respond to shortly.

However, in order, you know, some of the questions we have or may want to ask as RAIs may be dependent upon what SHINE actually ends up being defined as.

So it's becoming critical that we get a definitive licensing approach for these irradiation units sooner rather than later so that we do not have to stop our review. That is why we are recommending this direct final rule to add SHINE's irradiation units to the definition of utilization facility.

CHAIRMAN STETKAR: Steven, just a process question as far as the Committee's concerned.

MR. LYNCH: Yes.

CHAIRMAN STETKAR: I'm assuming, well correct me if I'm wrong, that you're planning to issue just a single final safety evaluation report?

In other words, some of the new reactors

under Part 52, the staff has been developing draft safety evaluation reports with open items and we've had involvement with those early on to get early feedback both from the staff and the applicant to the ACRS so we could become familiar with the machine and feedback from the ACRS to the staff and the applicant in terms of any issues that we might have. You're not --

MR. LYNCH: Actually, that is the process I think we intend to follow.

CHAIRMAN STETKAR: Are you?

MR. LYNCH: We intend to put our draft safety evaluation report together, come to the ACRS, bring SHINE with us --

CHAIRMAN STETKAR: Good.

MR. LYNCH: -- and go through that.

CHAIRMAN STETKAR: Thank you.

MEMBER BLEY: The only difference will be --

CHAIRMAN STETKAR: I think that's been, I mean it's a little bit more involved but I think it's been useful from both perspectives in terms of getting early interactions on our parts.

MEMBER BLEY: Do you expect to have the whole thing put together with open items before you

come or would you be coming piece by piece?

MR. LYNCH: So we're still figuring that out. Right now we look at, depending on schedules too we may break this up into two subcommittee briefings followed by the Full Committee briefing.

MEMBER BLEY: And we currently have a subcommittee meeting scheduled.

MR. LYNCH: Yes.

MEMBER BLEY: Is that going to be an overview of the design or is that going to be getting into some details of your review?

MR. LYNCH: The next time we plan on coming back will be to go over the draft safety evaluation report.

MR. ADAMS: Okay.

MR. LYNCH: Or portions of.

MR. ADAMS: Now if, you know, if you believe there's benefit to coming back before then along the way, you know, I think --

MEMBER RYAN: And that would be a Full Committee briefing that we're talking about?

MR. LYNCH: It would be subcommittee followed by full committee.

MEMBER RYAN: Okay, that's probably all right.

CHAIRMAN STETKAR: It depends a bit on the complexity.

MEMBER RYAN: Yes.

CHAIRMAN STETKAR: I mean --

MEMBER SKILLMAN: I'd like to ask, just conceptually, what are the waste streams or the waste components associated with this process? As we think about meeting with you again, I think we can see a medium sized facility, a couple of tanks, some processing equipment, but there's going to be a back end to this.

MR. ADAMS: That's a very interesting question. And, you know, when we starting talking to SHINE our, you know, first question is is that my, you know, half-jokingly said, you know, why don't you get another gallon of fuel and some control rods and call it a research reactor and, you know, and we know where we're at.

And their original answer is, yes, but if it's a reactor than I have spent nuclear fuel. The American Medical Isotopes Act solves that problem.

The uranium for these moly-99 production facilities will be lease take back from DOE. So all the high-level wastes from the process will go back to DOE. So the Applicant/Licensee will never own the

material.

Similar to university research reactors, you know, they don't --

MEMBER BLEY: But they'll be --

MR. ADAMS: -- they don't own --

MEMBER BLEY: I mean --

CHAIRMAN STETKAR: Wait, wait, wait.

MEMBER BLEY: -- you do a batch and then you process it and you get out the good stuff, but you're going to be taking out fission products too. You reuse the uranium.

MEMBER SKILLMAN: If --

MEMBER BLEY: Well, so --

MEMBER SKILLMAN: If you go back to Slide 11, let's go back to Slide 11.

MR. ADAMS: So your question is, is they're still working on that, that they believe that the process basically removes the moly -99 --

MEMBER BLEY: Only?

MR. ADAMS: Only. And so it goes back into the --

MEMBER BLEY: So this thing will be building up fission products --

MR. ADAMS: Yes.

MEMBER BLEY: -- and other junk?

MR. ADAMS: The only, and they will have the capability to remove the fission products, but from what they've told us at this point they would only do that if they needed to do it for operational reasons or for medical, you know, medical drug reasons.

MEMBER RYAN: Medical uses of isotopes.

MR. ADAMS: Well medical drug reasons. If for some reason the buildup, the buildup of isotopes or plutonium or anything else in the liquid target would bang up against the FDA approval for the medical, for the medical drug, then they would take steps. Am I --

MEMBER RYAN: So basically what you're saying there's too much of the stuff you don't want in there in there, they would clean it up and create a waste --

MR. ADAMS: Yes, they would --

MEMBER RYAN: -- and that would meet all the requirements for patient safety?

MR. ADAMS: Right. That, what would drive, our understand is what would drive the decision to clean up the fuel, it's not fuel, the target, the target uranium would be if they needed to do it to maintain the medical --

MEMBER BLEY: And by that you mean the purity of the moly they're taking out?

MR. ADAMS: Right.

MEMBER RYAN: No.

MR. ADAMS: Well the --

MEMBER BLEY: I just heard a yes and a no at the same time.

MEMBER RYAN: It's like the contaminants that's with the moly.

MR. ADAMS: It's, right, the purity of moly in that there's restrictions on, you know, how much plutonium, how much other fission products.

MEMBER BLEY: Right.

MR. ADAMS: That's the stream you're talking about.

MEMBER BLEY: Yes. If the good product stream starts becoming contaminating then they got to clean it up?

MR. ADAMS: Right.

MEMBER BLEY: Okay.

MEMBER SKILLMAN: Where I was going with my question is, if you have aqueous uranium-235 and you're introducing a neutron flux, you're going to have fission. And if you have fission you're going to have cesium-134, 137, strontium-89, 90, praseodymium-

144.

MR. ADAMS: All of them.

MEMBER SKILLMAN: You're going to have the whole family, they're all going to show up, along with your other product.

MR. ADAMS: Yes.

MEMBER SKILLMAN: And so my question about waste is really about those isotopes, some of which are pretty punchy. You've got to deal with that. I mean very strong gamma from a number of those isotopes.

And so here is this pot of stuff that is fissioning and in addition to your product you're getting some other stuff that we've learned are pretty hot to handle. And that means there's going to have to be a waste processing stream, there's going to have to be a cleanup system, they're going to have to be some radiological controls around the fields that are established by those isotopes --

MR. ADAMS: The answer --

MEMBER SKILLMAN: -- and so the it seems to me the back end of this has some very interesting challenges.

MEMBER RYAN: Well there's one very important thing at the need of all that there and

that's whose going to take the waste?

MEMBER SKILLMAN: That too.

MEMBER RYAN: Where's it going to go?

MR. LYNCH: So SHINE has also prepared, in one of their public meetings they came in with a very detailed chart of disposition pathways for every type of waste that they anticipate coming out of on their facility. So they have thought this through.

We'll have to look at it as part of the application, but they have, it is something they are thinking about.

MEMBER RYAN: It's good to see that.

MR. ADAMS: But you're right that not only SHINE but, you know, anybody else who comes in that wants to make moly using fission products is going to have these same issues. That basically it's like a mini-PUREX plant that they're dealing with.

And indeed the designs we've seen, you know, handle all those aspects. You know, the back end --

MEMBER RYAN: Part of --

MR. ADAMS: -- DOE says they'll --

MEMBER RYAN: -- question is, where are the waste sites that are going to take this?

MR. ADAMS: DOE.

MEMBER RYAN: We have compacts, we have, oh, DOE.

MR. ADAMS: DOE.

MEMBER RYAN: Okay. Well than that won't be a waste, it will be a material they'll hold onto for awhile.

MR. ADAMS: That, all those questions about the back end is what the American Medical Isotope Act was put together to solve, so it's DOE's, you know, the material, the ownership of the material will not pass to the Applicant. It's, again, like a --

MEMBER RYAN: I remember that they'll never own it but DOE will own all the waste no matter what.

MR. ADAMS: Yes.

MEMBER RYAN: Wow.

MR. KOKAJKO: I should add that we do meet with DOE and NNSA relatively routinely and --

MEMBER RYAN: That's the first problem.

MR. KOKAJKO: -- this is a question that has come up before, it will continue to come up as review of the application proceeds. This is a question we have as well.

There's a lot of operational issues that

have yet to be fully assessed and clearly we have many of the same questions that you have.

What we are committing to today is that as this review proceeds we'd like to come and consult with you and make, keep you aware and, as we move through this program because I think it's important and I think it's, we're all interesting in the outcome which is production of moly as a medical isotope.

MR. ADAMS: And we do have experience in this that its been a long time but we, you know, we licensed a reactor that was owned by Cintichem which, you know, that was solid targets but it was uranium fission production of moly-99. So we have done, you know, we have done this in this country successfully and safely.

So we, and we have went and got a bunch of boxes out of storage and we're looking at it. And last January a member of the group, who retired, was the operations manager at Cintichem for a number of years. And while we were developing the guidance documents, the ISG that I talked about, we did have under NRC employee for a year, the facility, the gentleman that was directly of the Cintichem operation.

So we did seek out the technical knowledge

that existed out there and did bring it to bare on developing our guidance to make sure that we were covering the right bases.

MEMBER BLEY: I have just a kind of a process question. If rather than a private firm doing this, DOE was actually doing it themselves for, I think NRC and DOE have jointly decided, and I could be wrong on this, that if it's a DOE reactor NRC will not be licensing it, is that where we stand now?

MR. ADAMS: NRC does not license DOE reactors.

MEMBER BLEY: Okay. There was, that was changing for awhile and then --

MR. ADAMS: Every once in awhile the idea craps up, I, you know, spent three months of my life --

MEMBER BLEY: If there was a DOE facility we wouldn't be looking at it?

MR. ADAMS: No. I mean I spent three months of my life at HIFAR doing a readiness review for NRC licensing and that report is resting comfortably somewhere. The idea does comes up, we do look at it.

MEMBER BLEY: But the MOX plant we're looking at. So never mind.

MEMBER REMPE: Has there been something recently that came out that DOE said we don't want you to license, if for example, a new reactor where to be built or restarted, has there been something that they've said we don't want NRC involved?

MR. ADAMS: We, the only time we have entered into that discussion is when Congress has told us to go and --

MEMBER REMPE: So nothing recent has happened?

MR. ADAMS: Yes, nothing recent.

MEMBER REMPE: The change in the status.

MEMBER BLEY: A few years ago the Commission, I think, in some fashion spoke that they really didn't want to do that. I don't remember the details.

MEMBER POWERS: I know that twice the FFTF reactor in Clinch River, the NRC reviewed them, they didn't licensed them. They reviewed them. And now there was, and may still be, an active program of using the ACRR for moly-99 production. And again, it would not be either licensed or reviewed by NRC in that case.

MR. KOKAJKO: If I recall it was a number of years ago, I think Shirley Jackson who was the

chairman at the time was at a number of discussions with the Commission as well with members of Congress. And the Congress was interested in whether or not we should regulate elements of the Department of Energy.

There was some discussion that if they built a new reactor they might, we might, get involved in that. But those discussions I don't think we ever proceeded to any state of finality.

MEMBER BLEY: Okay.

MR. KOKAJKO: And, but I'll point out here that, you know, what SHINE is proposing, DOE were to propose the same method, it would not be considered a reactor. There are a number of things that I think probably are still in the works downtown, but we're not familiar with them at this time. Certainly nothing recently.

And in terms of the Medical Isotope Production Act, the Congress took steps to try assure that, you know, map out our regulator role very clearly. Including the role for NNSA, which is to help facilitate the, I guess the, developing the industrial capacity to make this isotope for medical uses.

MR. ADAMS: The Act did require us to coordinate with DOE on environmental documentation.

So we're working with the EIS that we're preparing, we're coordinating with DOE for joint use if needed.

MR. KOKAJKO: One final thing I would say is that other potential applicants have come and talked with us about, with, in terms of a pre-application type thing. And while we have received no other application yet, we may get some in the future and we certainly would keep you posted as to that because this could be, there could be other applicants coming in which will also have their own technologies that they're going to employ.

Some will probably employ more traditional means. SHINE is a relatively unique one, in the approach that they're taking.

MEMBER BLEY: One last question for me on this, on the licensing step. University and other research reactors are licensed. I take it from this discussion that the subcritical facilities at universities are not licensed. Is that right?

MR. ADAMS: The subcritical assemblies at research reactors are mostly licensed under state licenses because they don't contain a critical mass by the definition in Part 70. In some cases where it's not an agreement state, you know, the NRC does license it.

MEMBER BLEY: Well you do. Even though it's subcritical so it's not --

MR. ADAMS: Well if not's --

MEMBER BLEY: -- reactor.

MR. ADAMS: -- in agreement state the source material or the S&M has to be licensed somewhere. When I was licensed a licensee I had a subcritical assembly and it was licensed by the State of New York.

MEMBER BLEY: Okay.

MEMBER SCHULTZ: Steven, you mentioned earlier in the discussion about the environmental impact statement that the staff is going to prepare. And on the last slide you indicate a couple of activities that have happened last year related to that.

MR. LYNCH: Yes.

MEMBER SCHULTZ: A program plan for that going forward or ongoing?

MR. LYNCH: So it's environment, preparation of the environmental impact statement is ongoing. They've issues a set of RAIs that SHINE responded and they are still continuing to draft their environmental impact statement.

And right now they're getting to the point

where they're slowing down some of their work as they need to make sure that they cross reference with what we're doing in the preliminary safety analysis report review to make sure that we're all, we all have the same thing that we're saying.

MEMBER SCHULTZ: And --

MR. LYNCH: And they're also working on finalizing their memorandum of agreement with the Department of Energy. Since we have different federal actions, our action is to review the SHINE application for safety. DOE is giving SHINE money to build.

So we each have to prepare an EIS and we're wanting to do that together so that, we're putting that together and we're going to start sending chapters over to, of the EIS over for DOE review and comment so that we can make sure that everyone agrees on the language. That is still going forward.

MEMBER SCHULTZ: They've have these public scoping meetings. What is the next step associated with public meetings starting with the environmental impact, particularly?

MR. KOKAJKO: I'm trying to think, they issue, when they issue --

MR. LYNCH: A draft, you're right.

MR. KOKAJKO: -- draft EIS they have a

public meeting --

MEMBER SCHULTZ: At that time?

MR. KOKAJKO: -- and they have a public meeting to do, seek public comments as well as they do it written public comments can be provided.

After resolution they would then prepare the final. And the final EIS is typically reviewed by the EPA.

MEMBER SCHULTZ: Okay, thank you.

MR. LYNCH: Think that's all the presentation materials we have. We're happy to answer --

MEMBER RYAN: Any other questions from members?

CHAIRMAN STETKAR: Thank you.

MR. KOKAJKO: Thank you very much.

MR. LYNCH: Thank you.

MEMBER RYAN: Thank you all, it's been a very good opening briefing and we'll look forward for many more to come.

MR. LYNCH: Great, thank you.

MEMBER RYAN: Thanks very much for your time. Chairman?

CHAIRMAN STETKAR: Thank you. Again, as we usually do, if there's any member of the public in

the room that would like to make any statements? And I don't, Maitri, do we have anyone on the bridge line?

MS. BANERJEE: People from SHINE were, are --

CHAIRMAN STETKAR: Okay, let's open up the bridge line and see if anyone out there would like to make a comment. It's open? Yes, it is.

If there's, do us a favor, if there's anyone out there just say something so we can confirm first that the bridge line is open. It sounds silly but it's the only way we know this.

PARTICIPANT: Yes, sorry you didn't hear me before, this is Jim Pastido and Dan Bindim, with SHINE.

CHAIRMAN STETKAR: Great, thank you --

PARTICIPANT: And we did not have any comments.

CHAIRMAN STETKAR: Great thank you. So now we've confirmed the bridge line is open, if there's anyone else out there who would like to make a comment we'd entertain it.

MR. ZIMMERMAN: Hi, this is Chris Zimmerman from the State of Wisconsin, can you hear me?

CHAIRMAN STETKAR: Yes.

MR. ZIMMERMAN: All right.

MR. ZIMMERMAN: Chris, just speak up a little bit just so we make sure. We can hear you but not all that clearly.

MR. ZIMMERMAN: Oh, okay, I'm sorry, is that better?

CHAIRMAN STETKAR: A little bit.

MR. ZIMMERMAN: Okay. The only comment that I would want to make, I know we have talked to Clinch numerous times during this, and due to state statute of Wisconsin we are required to do any shielding calculation and licensing and registering of all accelerators in the State of Wisconsin.

So during the rule change of the definition, it would still require a letter from the NRC saying they have the expertise to license and register or either/or any accelerators in the State of Wisconsin because --

(Telephone connection interrupted)

CHAIRMAN STETKAR: Chris? Chris?

MR. ZIMMERMAN: -- all requirements for oversight to the NRC.

CHAIRMAN STETKAR: Okay, great. Thanks a lot, you're breaking up a little bit. I think we got everything.

Could you repeat the last sentence because I think that was, pulled things together and you broke up quite a bit there. If you're on a regular phone it might help to take it off speaker and --

MR. ZIMMERMAN: Yes, I'm -- can you hear me better now?

CHAIRMAN STETKAR: Yes. Yes.

MR. ZIMMERMAN: Okay. The last part was, for our state statutes for us to legally give over oversight and inspection requirements to the accelerators, we need a letter from the NRC stating, giving us reasonable assurance that your staff has the expertise to adequately protect the members of the Wisconsin public from any radiation exposure.

CHAIRMAN STETKAR: Okay great, thank you very much. And we got that again. Sorry about the confusion. Is there anyone else that has any comments to make?

If not, thank you for your comments from the bridge line. And thanks to the Staff for an informative briefing. We look forward to hearing more about the machine and the staff's review of it certainly. It's an interesting, interesting device. And with that we are recessed until 1:45.

(Whereupon, the above-entitled matter went

off the record at 11:56 a.m. and resumed at 1:47 p.m.)

CHAIRMAN STETKAR: With that, let's reconvene. And the first topic this afternoon is going to be an overview of the status of the Level 3 PRA Project. And I will lead that discussion.

I'll keep the introduction brief. We've had several subcommittee meetings with the Level 3 PRA Team to look at their schedule and look at some of their early technical work. We're not going to hear about any of the details of the technical work today because of a variety of issues.

Kevin, I don't know if you want to say anything as an introduction?

MR. COYNE: Just a couple of brief statements. Kevin Coyne, I'm the Branch Chief of the PRA Branch in the Office of Nuclear Regulatory Research.

Again, thank you for the opportunity to brief the Full Committee on the integrated site PRA Project for the Vogtle Electric Generating Station, Units 1 and 2.

As Mr. Stetkar mentioned, it's been a while since we talked to the Full Committee, it's been about three years since we last briefed the Full Committee and that was back during the development of

the SECY-11-0089 at the start of the study. But we've had several interactions with the Reliability and PRA Subcommittee since that point and we're looking forward to briefing the Full Committee on the status of the project.

As Alan and Mary will discuss this is an ambitious and fairly complex project and has required extensive planning, preparation and coordination. Despite some obvious schedule challenges, as Alan will get into later, we are making progress on all technical areas of the study and this year has been a very productive year as some of the first pieces of the project really start coming together on the internal events that power PRA.

I want to acknowledge the strong support we got from the Full Committee when this project was first initiated. One of the key points raised by the Committee members when recommending that we proceed with the study is that performing a plant-specific PRA study was one of the most efficient ways to identify knowledge gaps we have in PRA.

As illustrated by some of the technical challenges Alan will discuss later on this was a very prescient insight. For example, we've already identified the need to perform some additional work on

interfacing system LOCA as a result of some of our modeling that we've been looking at.

This is going to be an opportunity to pilot some of the expert elicitation guidance that Research is developing and will help better refine both the modeling for this project, but also benefit PRA State-of-the-art and state-of-practice as we go forward.

And that's just one example of a gap that we probably wouldn't have identified unless we got actually into the details doing the plant-specific studies. It's been a good thing for us to work on.

With that I'll turn it over to Alan Kuritzky, our overarching project manager for the project.

MR. KURITZKY: Thank you, Kevin. Okay. I'm Alan Kuritzky, as Kevin mentioned I'm the program manager for the Level 3 PRA Project. I echo Kevin's sentiments, I appreciate the opportunity to talk to the Full Committee about this project.

I want to apologize in advance to those members of the subcommittee who are going to sit through stuff today that you've heard time and time again. Your patience is appreciated.

MEMBER POWERS: You don't think they

retained anything do you?

MR. KURITZKY: A refresher. It'll be a nice refresher, right? From two months ago.

In any case this project involves a lot of people. It's a huge team. I'm giving you the presentation today but we have team members and support from all across the Agency and from all the divisions in Research and help from other offices. Mary Drouin, sitting next to me, is our principle technical advisor and has been instrumental in the work done. As obviously as Kevin Coyne as a branch chief but also a technical advisor for this project too. So we have quite a robust team.

Just a quick outline of what we're going to talk about today, it's a fairly brief meeting so I'm going to go through these things relatively quickly.

The background of the project it, you know, the SRM that directed it. Project philosophy in terms of the project scope and the objectives. Some of the uses of the project, regulatory uses that the results of Level 3 PRA may be used for.

Our infrastructure, as Kevin mentioned, was very extensive. The planning and the, you know, putting together all the preparatory activities for

this project was quite extensive. I'll go over that briefly.

Just touch on some of the previous interactions that Kevin mentioned about when we came to see the PRA and Reliability Subcommittee. A little bit about the technical approach.

And our volunteer plant, the Vogtle Units 1 and 2. Southern Nuclear was nice enough to volunteer Vogtle Units 1 and 2 for the study and so I'll touch a little about some unique characteristics that plant before going into the status of all the different parts of the project. And then some concluding remarks.

So it was back in 2011 when the staff issued or submitted a Commission paper to the Commission to outline three different possibilities for doing Level 3 activities.

The first option was just pretty much maintain what was going on at the time.

The second option was to take some of the recognized gaps in PRA technology and do research to fill some of those gaps before embarking on a Level 3 PRA.

And the third option was just to go forward and do the whole comprehensive full-scope

Level 3 PRA.

The staff had recommended Option 2 at that time, principally because there's a limited number of experienced PRA practitioners at the Agency. They all were committed to other high priority projects at the time, like NFP-805 and other things. And so we felt, the staff felt like we could do this an interim work on site-level gaps and then we'd have hopefully more staff available to do the project and be more efficient when we actually embarked on the study.

The ACRS actually wrote a letter to the Commission, I think that June, recommending that the staff move forward right with the Level 3 PRA. As Kevin mentioned one of the things the Committee had suggested was that by doing the PRA we will identify those areas, a more efficient way of identifying areas that needed more work and we can do those kind of in parallel to the study itself.

The Commission agreed with the recommendation from the ACRS and did direct the staff to go forward with the full study, with some adjustment to the schedule. The original, I think, SRM called for a three-year schedule and the Commission identified four years.

Also the Commission, in the SRM, wanted

the staff to identify the various ways that this study's results might be used in the regulatory arena. So there was a SECY paper, 12-0123, what was provided to the Commission in, I think, September of 2012 that lays out some of those activities, or some of those potential uses. And I'll touch on some of those later in the presentation.

There are a number of objectives for this project. First and foremost it's been probably 25 years or so since the NRC last sponsored a Level 3 PRA, that was the NUREG-1150 studies. And a lot has changed both in terms of PRA practices as well as conditions at the plants in that timeframe.

And so it was kind of an opportunity to kind of reset the risk, you know, the risk profile to see where we stand right now with current PRA techniques and current plant configurations and procedures. What type of risk are we looking at and what kind of risk profile do we have right now.

In addition we also wanted to expand the scope a little more than what was in NUREG-1150. NUREG-1150 did cover a lot of things but we also wanted to bring into this scope, particularly other sources of radiological material, the principle sources of radiological material onsite, which

includes the spent fuel pools and dry cask storage. As well as looking at the multi-unit aspect, not just the single reactor by itself.

Another major objective of the study was to extract new insights to support regulatory decision making and also help determine more cost-effective ways of using the Agency's resources. Or prioritizing the use of Agency resources.

In addition, we wanted to take advantage of this project to kind of train up the next cadre of PRA practitioners for the Agency. Right now, as we mentioned, there's a limited number of experienced PRA practitioners and many of them are getting towards the autumn of their careers.

And so we wanted to make sure we had another set of PRA practitioners to kind of, you know, back-fill, and take over. Carry the torch. And so this gives a good opportunity for people in the junior and mid-career level to get experience in actually performing PRA and getting hands-on with PRAs.

In addition we also wanted to improve the documentation of PRAs, both to make them more transparent and more usable. So that was another goal for the study.

And lastly also we wanted to try to get

some insight at least into the cost and practicality of doing Level 3 PRAs.

The scope of this project, as I mentioned, is much broader than the 1150 because we are including all the major site radiological sources. We're going to look at them both individually as well as in a collective sense for integrated site risk

And we're also going to consider all the different types of hazards, internal events, internal floods, fires. All of the external hazards. As well as the different modes of plant operation, not only looking at full power operation but also looking at low power operation and shutdown.

In addition --

MEMBER POWERS: When you say shutdown, you're talking just a planned shutdown?

MR. KURITZKY: Yes, planned shutdowns. Yes.

MEMBER POWERS: So unplanned shutdowns don't get addressed in this?

MR. KURITZKY: No. I think, on an unplanned shutdown -- I can't speak prematurely, because that's actually, as I'll mention soon, that's the one part of the project that's kind of lagged behind so we haven't even really put together a full

plan on how we're going to do that.

Let me say I know we're going to look at planned shutdowns and I know we're going to look at low power. I don't know whether, I can't honestly say what our plans are for unplanned shutdowns.

MS. DROUIN: We've only started working on the plan for low power shutdown. And we are looking at what we would do with forced shutdowns. But we haven't made any decisions yet in that regard. But we are thinking about it.

MEMBER POWERS: Yes, I mean it's a tough, I mean it's always been a hard nut to say what do you do with these things. Because you don't, I mean, you know so little about --

MR. KURITZKY: Right. And they differ so much from each other.

MEMBER POWERS: That's right. And hard to predict and it's just a major undertaking to go out and try to imagine, especially for a plant that hasn't been operated extensively, like Vogtle.

MR. KURITZKY: Right. And along the same lines, even the planned shutdowns have a lot of variation to them.

MEMBER POWERS: Yes. Yes.

MR. KURITZKY: So it's that same problem.

MEMBER POWERS: But at least you have something to go on.

MEMBER BLEY: Well a lot of the plants now have -- A long time ago they were doing this in Europe, have contingency plans for all sorts of forced shutdowns that lay out a full schedule for handling what they'll do during that time. So, you know, there are things you could do. Of course you don't know what's going to happen next year if you're trying to do that sort of analysis. But for a particular one you could look at them.

MR. KURITZKY: Yes. And then, like Mary said, it's we just have to look into and see how we're going to address it.

Okay. So going to some of the things that have changed over the last 25 years in terms of PRA technology. There's been obviously improvement in our severe accident modeling. There's been improvements in common cause failure modeling. HRA, human reliability analysis, there's been advancements. Also data, we have a lot better data now with newer and more complete data.

In terms of plant operational performance and safety, there's improved plant operational maintenance and training programs. There's the

implementation of severe accident management guidelines. Extensive damage mitigation guidelines and other B.5.b mitigation strategies. So we want to take credit for those in the PRA.

One thing I do want to point out that, unlike NUREG-1150, which dealt with the spectrum of reactor and containment types, this study is just for a single dual-unit site. So there's going to be some limitation in how much we can extrapolate the results and the insights in this study to the fleet of reactors.

So, as I mentioned, SECY-12-0123 identifies a number of areas that potentially the results of Level 3 PRA could manifest themselves in the regulatory arena. In that Commission paper it breaks down the potential uses in the four categories, as are listed here on the slide.

Enhancing the technical basis for the use of risk information would be things like having an improved and enhanced understanding of the plant risk profile.

Improving the PRA state-of-practice would be things like demonstrating methods for site risk assessment as opposed to individual reactor risk assessment.

Identifying safety and regulatory improvements can involve either the licensees making voluntary changes at their plants or actual leading to regulatory changes.

And supporting knowledge management would be things like, as I mentioned, improving the in-house PRA technical capabilities of the staff. And also improving the documentation aspects of PRA studies in general.

So here's a busy slide on project infrastructure. But I just wanted to throw this up here because when dealing with a project of this vast scope and complexity there is a lot of planning and preparation that has to take place before we can actually start doing the technical analysis.

And so this just kind of gives a visual perspective of all the types of activities we had to do before we could start really grinding out the work on the Level 3 PRA Project. And the timeframe of this slide alone is a couple of years and it involves infrastructure activities in many different areas. I'm not going to go over this thing in detail, I just want to point out a couple of things in particular.

For instance under organization, there's a lot of logistical challenges there because the Level

3 PRA Project Team consists of a large number of part time staff and contractors. I think we have somewhere around the neighborhood of 40 staff working on the project and about 20 contractors. So the logistical issues there are obvious enough.

But, in addition, we have many of these part time, particularly the staff, having other projects they're working on that can be a higher priority and often-times are of higher priority. And so, trying to get essentially all the oars in the water at the same time and rowing in unison has been very difficult.

So that's something we've had just to deal with for the life of the project and I don't envision that changing much going forward.

Another item, harking back to the June ACRS letter to the Commission on this project, one of the other recommendations from the Committee was to involve, have the staff work with industry to come up with a volunteer site for this project. And we did that and we worked with NEI and that's how we ended up with Southern Nuclear volunteering the Vogtle site. So that's worked out very well for us.

We spent sometime developing a communication protocol with the licensee to manage the

control and transfer of information because we're getting a lot of plant-specific and proprietary information from the licensee.

So a lot of protections had to be put in place to properly control that information. We're in virtual constant contact with the licensee, we have very good communication channels opened and they've been very supportive of the project. So that's been much to our benefit.

I do want to mention for --

MEMBER BLEY: Well one of the things, you didn't include this old slide that I think the rest of the Committee might be interested in, was one of the things they did early on was kind of map out of all the plants that they might work with what parts of this complete PRA they're trying to do were available already. And there were absolutely none that came close to covering it all but there were a fair number that picked up good pieces. And this one, I forgot how it fell among that.

MR. KURITZKY: Well it actually did turn out to be fairly --

CHAIRMAN STETKAR: Vogtle's not too bad.

MR. KURITZKY: Was not too bad. One of the biggest things we needed was a fire PRA, because

that's something we just didn't have the resources to redo ourselves. And unfortunately actually Vogtle wasn't in our list of preferred candidates initially becks they were not a NFP-805 plant, which is what we were kind of using as our default surrogate for whether they'd have a fire PRA.

But, as luck would have it, Vogtle, because they have a number of risk-informed initiatives in-house that necessitated them to do a fire PRA. So they had peer-reviewed fire PRA which was a big crib item for us in doing this study.

CHAIRMAN STETKAR: And they're doing some work in the seismic area.

MR. KURITZKY: And they're doing work in seismic, which has become very beneficial also. Yes.

MEMBER POWERS: And their work on seismic is pretty darn good too. I mean, we looked at it for the early site permit.

CHAIRMAN STETKAR: On the seismicity. On the seismicity. We haven't looked at --

MR. KURITZKY: Fragility.

CHAIRMAN STETKAR: We haven't seen the fragility, you know, the wiring it into the PRA model yet.

MR. KURITZKY: Right.

MEMBER POWERS: We looked at the seismicity and, I mean, that was pretty sophisticated stuff because they got a complex seismic source up north of them.

CHAIRMAN STETKAR: Yes.

MR. KURITZKY: Right. So yes, Vogtle turned out to be a very fortuitous choice. Part by design, part by luck.

So also I just wanted to mention the quality assurance, that's also a key aspect for any major analysis in order to demonstrate the technical accuracy of the work. And as part of our QA plan we have an element called technical reviews and we have multiple levels of technical reviews that we have planned for the study.

We have a technical advisory group that's made up of many of the senior level advisors in the Agency in PRA as well as some of the related areas, like thermohydraulics and structural analysis. And that group is there to give insight advice and guidance to the staff and review our various work products.

We also have self-assessments that we do of our own work and then have external peer reviews of that work. And have external peer reviews of that

work as another layer of review for the project. So have a fairly extensive QA program in place and several levels of review for the study.

MS. DROUIN: One of the, also the other aspects of the QA plan that's a major part is the documentation. Because it really is through the documentation that you demonstrate, you know, the technical robustness of your study.

And with a study of this size and the vast number of people working on it, you know, to ensure that you get that documentation and document those things that are critical. So the QA plan does go into quite a bit on documentation.

MR. KURITZKY: Thank you, Mary.

Okay. So quickly, this is just a quick summary of some of the previous interactions that Kevin alluded to, and I think Chairman Stetkar had mentioned before, how we've come and talk to the subcommittee several times.

Back in March of 2012 we presented our initial project plan. Then we developed the technical analysis approach plan, which I'll discuss in more detail shortly. That's really our play book for the whole project.

We came in December 2012 to brief the

subcommittee on that. It was actually too much information to get into one one-day meeting so we broke it up. We briefed the subcommittee on the reactor portions of the study in December and came back in May to brief the subcommittee on the spent fuel pool and dry cask storage aspects of the study.

A couple months after that we came back to talk in more detail on our integrated site-risk modeling approach as well as some additional detail on HRA approach.

In the afternoon of that meeting we had a closed session to go over with the subcommittee some of our initial Level-1 internal event results.

And just this past February we came back to the subcommittee to give a general project status with a particular focus on our severe accident progression and consequence analysis portions of the study. And then closed the afternoon so that we could get into detailed discussions with the subcommittee on some of the ongoing work. That was something that was a little more novel in what we were doing.

At the request of the subcommittee we provided some ongoing pre-work to the subcommittee for them to look at for a few works and then we met with them so we could go into detail to some of the

comments they might have on the details of the work. As Chairman Stetkar can let you know, we got through a mere fraction of we wanted to discuss in that meeting and we just are having additional discussions as to how we can make that process more efficient and get feedback in a more useful timeframe.

CHAIRMAN STETKAR: Yes. For the benefit of the other Committee members it's a difficult process because of the size of the project and kind of traditional interactions between the staff and ACRS. We've been trying to interact with the staff on a more frequent focused technical topic interim basis rather than the staff developing a finished work product and presenting it to the subcommittee for a review with a subsequent review by the Full Committee.

The project is so large and it has so many tentacles that I think we feel that it can be more beneficial both for the, subcommittee anyway, members understanding and perhaps from some early feedback to the staff to have more frequent interactions focused on specific technical topics so that, at least at the subcommittee level, we have some understanding of the technical issues that the staff may be struggling with or the direction that they're heading in terms of trying to solve a particular technical problem and get

a better exchange at that level.

Because of the, and Alan's already mentioned it, because of the interim status of many of these things and plant-specific information of necessity we can better handle that at the subcommittee level where we have the ability to close the meetings and discuss some details that are, you know, very, very, very preliminary in nature and may tread on proprietary information that we can't discuss at the same level of detail in the Full Committee briefing.

So we're in, as Alan mentioned, in progress in developing that type of an exchange process that interact with the staff. And then, as Alan will get it to, as more definitive milestones become developed to a level of technical maturity then we anticipate bringing them to the Full Committee for a more formal exchange and review and Committee letters on them.

MR. KURITZKY: Thank you.

MEMBER REMPE: During our last full subcommittee meeting there was discussion of having these informal meetings and having a less formal format, and how's that working out?

MR. KURITZKY: Well we've had one so far.

MEMBER REMPE: Okay.

CHAIRMAN STETKAR: I mean the February 2014 was the closed portion that's listed up there is part of that. And we have another one planned for, don't hold me to the date, some time in October, mid-October. And as late as 35 minutes ago we were discussing other, we don't have dates set for them. But it's progressing. We are planning to do that.

It's a struggle because the staff has milestones they need to meet. And we need to find holes in our schedule at the appropriate times to schedule the meetings, but we're working on it.

MR. KURITZKY: Okay. At the onset of the project we made a decision that we would focus on using NRC tools. There are two main reasons why we wanted to do that. The first is obviously familiarity, the staff using its own tools, obviously they're more familiar with them.

The second thing was given the complexity and size of this model we felt there might be a need to make adjustments to the tools and we would have that capability if we were using our own tools. So for both those reasons we decided to use the basic NRC PRA tools and supporting tools.

So as you see on this slide, SAPHIRE 8 is

the main PRA platform that we're using. That's the NRC's PRA code that we use for all of our SPAR models. It also has been modified to be able to handle larger models, you know, much larger than the SPAR models.

And also, I'll mention it a little bit later too, for the Level 1 and Level 2 portions of the study we're actually trying to integrate the two of them together. So we can actually pass the cuts of the information right through from Level 1 through Level 2 all the way to release category. So that's an additional upgrade that we had to make to the SAPHIRE code.

MELCOR is what we're using for all the thermohydraulic analyses. It's our go-to code for accident sequence timing and system success criteria and severe accident progression. And it can be used for any type of radiological source, whether it be a reactor, a spent fuel pool or dry cask. So that's our --

MEMBER POWERS: Are you going to be trying any of these dynamic APEDs and things like that?

MR. KURITZKY: For this project, we're not. For this project, and I didn't dwell on before, it's a state-of-practice project. So in most cases, unless we have to because nothing exists, we're really

sticking with the tried and true.

I think the, connecting the two pieces together is about as pushing-edge as we're doing I think.

MEMBER POWERS: Well I mean it's just that APEDs can be so time consuming. And if they tweak MELCOR a little bit you get to do it all over again. With a dynamic, as a progression of entry you, at least it does it automatically for you.

MR. KURITZKY: That will be the next project.

CHAIRMAN STETKAR: That's important, and Alan, you may want to expand on this. This project is being characterized as a state-of-the-practice Level 3 PRA. Not necessarily a state-of-the-art . And there's a subtle different between state-of-the-art and state of the practice. State-of-the-art tends to be pushing bounds of available research and doing things that have not been demonstrated in existing PRAs.

MR. KURITZKY: Right.

CHAIRMAN STETKAR: The staff has a tremendous amount of work to do here and they decided early, and we agreed, it's --

MEMBER POWERS: Well I mean, John, the

problem is I mean certainly in the 1150 effort we were lining the halls with -- I mean, just doing the APEDs can --

CHAIRMAN STETKAR: Right.

MEMBER POWERS: -- just be an enormously time-consuming task. But it's not the state-of-the-practice, it's manpower.

CHAIRMAN STETKAR: No, it's -- Yes, part of it's state-of-the-art in terms of just fundamental research. And part of it is, as you just mentioned, just resources.

MEMBER POWERS: Well I don't know --

CHAIRMAN STETKAR: Even if you know how to do it theoretically.

MEMBER POWERS: The automatic APEDs are getting pretty sophisticated nowadays.

CHAIRMAN STETKAR: Don, you had something?

MR. HELTON: Don Helton of the Research Staff. I was just going to mention that prior to doing the planning and the execution of the Vogtle Project we will have a two-year effort between the NRC, Sandia National Laboratories, the University of Maryland and Ohio State University to develop a demonstration of the use of a MELCOR-based coupled thermohydraulic dynamic scheduling and operator

response tool.

So I think we entered this with a pretty good understanding of the strengths and limitations of that type of approach. And we do see that there are benefits to that type of approach in certain applications, but we didn't feel that it was feasible in the context of this study.

MR. KURITZKY: Thank you, Don. Okay, and then also --

MEMBER POWERS: So is it going to put an additional burden on your QA program. Because you got this big hand-transfer that eventually has to be done.

MR. KURITZKY: And we recognize, I mean, it's --

MEMBER POWERS: I mean it was a non-trivial aspect of the 1150 phase.

MR. KURITZKY: Right.

MEMBER POWERS: And you're not trying to do five plans, you're --

MR. KURITZKY: Right. We're focused on -- And also since 1150 the accident prevention event trees or containment event trees, have simplified also substantially. Especially now we have a much more simplified containment event tree structure with decomposition event trees that support it that kind of

make it a little more manageable in size. I know some of the APEDs from 1150 had like 130 nodes or something like that.

MEMBER POWERS: Easily 130 nodes in them.

MR. KURITZKY: So it's a different story now.

Okay, also, just for the consequence analysis, we're using the MACCS2 codes, it's pretty much accepted as the go-to code for consequence analysis. And, again, it can evaluate the consequences, the public consequences, for any type of source. Whether it be a reactor or a spent fuel pool or dry cask. So that's the other tool we'll be using.

MEMBER POWERS: You call out spent fuel pools there. And you've got confidence that MELCOR knows how to model those spent fuel pool accidents?

MR. KURITZKY: I do. And Don Helton is going to tell you why. I do because Don does and he'll tell you why.

MEMBER POWERS: Well I trust Don too. Don, tell me why.

MR. HELTON: Again, unlike before, we had the benefit at the start of this project of having, in this case, two prior activities to help us in this. MELCOR was used for the security assessments that were

performed for the spent fuel pools post-9/11. And MELCOR was also used for a study, referred to as the Spent Fuel Pool Study, that was recently sent to the Commission in November of 2013.

And so both of those activities have given us the opportunity to understand some of the strengths and limitation of the code when applied to this problem. And to bring in some of the experimental modeling that's been done in the area of spent fuel pool accidents at Sandia National Laboratories with respect to the difference in zirconium oxidation rates and other phenomenon such as that.

And so we do believe that MELCOR is an appropriate tool for this purpose.

MEMBER POWERS: Okay. Well I guess I'm reasonably familiar with some of those experiments and those are single-bundled kind of experiments and we don't really have a whole pool so that we can look at how -- The full drain-down accidents, everybody knows how to do those. They're straight-forward and none to pleasant. It's the partial drain-down accidents that are the ones that nobody really knows how to handle. You don't know how to handle the natural convection.

MR. HELTON: It is true that the experiments were separate effects and so that's why it

required code validation using both separate effects and interval calculations. You are correct that those were focused on complete drain-downs and so that's why we've relied on other tools as well as a lot of sensitivities analyses and lengthy discussions with the ACRS to flesh out some of, again, the strengths and the limitations of the codes, and what we know it does well. And in the areas where there are some of the issues that you're raising then we have to rely on sensitivity study and other information sources to show the effect of those uncertainties.

MEMBER POWERS: The problem with sensitivity studies is you can't do sensitivity on phenomenon that's not in the code.

MR. KURITZKY: Well we recognize it's not a perfect solution but it's state-of-practice.

Okay. So just moving forward now onto the technical analysis approach. We touched on a little bit of this earlier. One of the key things going into this study in order to be able to get it done within the schedule and the resources that we had was we had to rely on some previously completed work from the licensee in terms of PRA models.

And, as we mentioned before, Southern had and has a peer-reviewed internal event PRA. They also

have one for internal floods as well as internal fires. So that was a big advantage to us going forward so we could take advantage of those models and then only have to do more of like review the peer-review findings and do some auditing of the model to make sure that it looked like we were in agreement with what was in there and would save ourselves a lot of work.

Now, in reality it didn't turn out quite that easily. I'll go into some of those details later, but that was the thought going in.

We also had the advantage, as Chairman Stetkar mentioned, in the fact that Vogtle is working on a seismic PRA right now. And while they don't have that model complete that we can use, they had generated seismic hazards curves, as Dr. Powers mentioned, that we were able to use as well as a lot of plant-specific fragilities.

Because the seismic hazard increased a fair amount from what it was thought to be back in the IPEEE, the licensee has gone back and done a more rigorous analysis of their component structure fragilities. And so we had the benefit of that information, though that information we'll have to go through and check to make sure we are okay with using

it for our PRA.

Moving on to the Level 2, Level 3 and low-power shutdown, these are areas where we don't have anything to start with. Actually the licensee does have a Level 2 PRA, but for a number of reasons we decided we wanted to do ours from scratch.

With all these other areas we're doing, as we mentioned, a state-of-practice PRA. And by state-of-practice, how we define that is methods, tools and datas that are routinely used by the NRC and licensees and/or have broad acceptance in the PRA technical community. So again, not pushing the edge except in those areas that we really have to.

In terms of the spent fuel pool and dry cask storage PRAs, we're relying a lot of previous studies. Don Helton just mentioned to you a couple of other studies on spent fuel pools recently that we are taking advantage of. That was the studies that were done for the security assessments for spent fuel pools after 9/11, as well as the recent Spent Fuel Pool Study.

Also we're taking advantage of the Spent Fuel Pool PRA that was documented in NUREG-1738, that was associated with decommissioning. So all those have kind of formed the backbone of the work that

we're doing for the Level 3 PRA Spent Fuel Pool Study.

In addition, for dry cask storage we're also relying on some previous studies. Primarily the NRC's study that was documented in NUREG-1864. Fortuitously that was done for a Hi-Storm 100 storage cask, which is the same design that Vogtle has at their site. So we were able to make a lot of use of information from that study.

EPRI also did a study on bolted storage casks and we're also making use of information from there. And in addition we are getting a lot of Vogtle-specific information to add to the model as well as some improved analysis methods and data that are in progress. And one thing in particular we're having Pacific Northwest National Lab do some additional structural analysis for us on both fuel failure and cask failure from the dropping.

In terms of integrated risk model, that is a brand new area essentially. And so we're kind of cutting our teeth there. One of the things we've decided is that it's just not practical to take all five individual models and jam them all together and account for dependencies and come up and come up with this beautiful integrated model.

So we have to be a little more smart about

how we're constructing this model. We're working on a simplified model. We're going through, right now, various renditions of how we can simplify the model and make sure we retain what we need to and not accidentally lose anything. One of the keys to that is taking the insights from the individual risk models to help focus on what we need to keep within that integrated model. And I'll mention a few more details on a later slide.

In terms of HRA, there are existing state-of-practice HRA methods for internal events, internal floods and internal files. However some of the other areas, like Level 2 dealing with the severe accident management guidelines or low-power shutdown, et cetera, there are no really established methods. So what we're having to do there essentially is take the methods that exist and adapt them as the best we can in a simplified manner for these other areas.

And particularly the HRA guidance for internal fires has been a main source of information for us. And we're kind of adapting a lot of what's in there to these other aspects.

The last thing I want to mention about our approach is actually a project management approach. One thing that was important, because there were so

many individual pieces to this study, and there's a big concern about making sure that they are integrated appropriately so it's important to have a management structure over top that's keeping track of the various pieces and making sure that things are remaining integrated.

And we've been fortunate to have a dedicated stable team that's running the project, that's been around since its entire duration. So that's helped keep things from falling off the table.

Also we have regularly scheduled team leader meetings, the leaders from all the different areas of the project meet every two or three weeks. We go over the status of the various areas and they get to discuss where they are in their parts of the study, what interfaces they might need to be tracking and be aware of. And so that leads to a lot of the offline discussions where they can make sure that they're staying coordinated.

We also have a technical analysis approach plan, which I'll discuss I think on the next slide. But in putting together that plan, which goes into detail about how we plan to approach all the different areas of the study, one of the main things that was required for the team leaders to put in that plan were

the various interfaces for their part of the study.

And that forced them to think about what other parts of the project they would need to be monitoring and be coordinating with.

MEMBER REMPE: Before you go on, I'm trying to remember the last subcommittee meeting I was attending by calling in, and there was some questions that I think I raised about the MELCOR model. That you're using 2.1 versus 1.86 which was perhaps used in prior assessments like the SOARCA evaluation. And there's been some modeling updates.

And then I thought there was also some documentation from EPRI that indicated that they might have done some other things and included certain things. And has the staff got a plan in place if they see some results that are coming out that are a bit different? You know, from prior, saying well okay this result's a little different than we've seen in prior studies but it's because of X, Y, Z model from MELCOR. Have you seen that at all?

MEMBER CORRADINI: Just one clarification. I thought SOARCA did use 2 point whatever, not 1 point whatever?

MEMBER REMPE: I thought they used 1.86.

MR. HELTON: I would welcome anyone from

the Division of DSA and Research to state this more affirmatively. But it's my recollection that SOARCA used 1.86.

MEMBER REMPE: I think so too.

MR. HELTON: I know that was at least the case a good two-thirds of the way through the project.

MEMBER REMPE: Yes, I believe so.

MR. HELTON: We are using MELCOR 2.1, I'm not sure I totally understood the question. And we have gone back and done a few comparisons between 2.1 and 1.86 to make sure we understand any differences. We're not seeing anything fundamental.

MEMBER REMPE: That's what I -- you didn't have, maybe, those results at the time. And just are you prepared to start looking and saying yes, we're going to see something different or we are seeing something different but we can explain it because of the fact the models have changed and been improved and things like that?

MR. HELTON: You know, my sense is is that there will be a little bit of that. But it will be the exception rather than the rule.

MEMBER CORRADINI: So can I ask the question differently?

MR. HELTON: Yes.

MEMBER CORRADINI: So whenever there's, I'm assuming that MELCOR has, I'll use the word QA, I can't come up with a better word, a set of calculational problems that it does to know that when it makes that modification it understands why something changed.

MR. HELTON: A benchmark suite.

MEMBER CORRADINI: So is that something that, I mean to ask Joy's questions a little differently. Did the fact you went from whatever it was to whatever you're using now, are the, knowing that you evolved or went from A to B, that you already expect some differences that you'd see in the calculation because of the model improvements?

MR. HELTON: Not at the macro level, I mean the major -- And let me for the record say that I am not the best suited person to answer questions about the MELCOR current development.

MEMBER CORRADINI: Well you can take it away, we don't have to know it now, but --

MR. HELTON: But the biggest different from 1.86 to 2.x was the infrastructure, the coding, going from I believe FORTRAN 77 to FORTRAN 95, but I may have those details slightly wrong. They maintained both codes for a little while and so they

did have that sort of understanding of what the transition was doing.

And only after some period of maintaining both codes did they start doing all of the model development solely in 2.1. I think in terms of the Vogtle project I would expect, or I would ask you to expect, that until we tell you differently that at a macro level there is not a fundamental shift from going from 1.86 to 2.1.

MEMBER CORRADINI: Okay. Thank you.

MEMBER REMPE: Okay. The other question I wanted to ask again that I brought up at the subcommittee meeting is when I was reading the EPRI documentation there had been an issue where certain input parameters were being relied upon based on other plants because of some timing issues or whatever issues. And, I mean, just volumes of things within the vessel or, they were things you could in the old days get from the FSAR so maybe that's no longer the case.

But there had been some issues that way where a lot of parameters were being extrapolate from other plants, just whatever reason. Has that been changed at all or are you still going with other plants to do your input about certain situations?

MR. HELTON: The situation now is largely the same as it was on February 19th. We have had additional interactions with the licensee about some of the aspects of containment design and containment modeling.

But there are number of design parameters related to the RCS that are Westinghouse proprietary and we've not been able to obtain directly through this project. And we've relied on other information that we have available for plants that we have confidence are very similar to Vogtle.

MEMBER REMPE: Okay. Thanks.

MR. KURITZKY: Thank you, Don.

Okay, the technical analysis approach plan, as I mentioned before, it's pretty much our play book for the project. It provides guidance in how we're going to put together the models. Because there are so many different areas to this study this is a way to enhance consistency amongst all the different pieces of the study. It provides traceability to how we developed those models.

It also highlights how the different pieces of the project will interface with each other. As I mentioned before, that's crucial for making sure that we don't have stovepiped analyses and that the

whole project is coming together in an integrated fashion.

Also it helps us develop review criteria for the different parts of the model. Particularly for those areas for which there is no existing or draft PRA standards. So for things like the spent fuel pool or dry cask storage, this is an area we can usually tap to help us come up with review criteria.

There was an initial version of the TAAP that was provided to our technical advisory group and also the ACRS for comment. And then ultimately released publically in April of 2013. There was a revised version that was put out in October of 2013.

And ultimately our vision for this is that near the end of the project it will be updated on a semi-regular basis, but near the end of the project it will kind of morph itself from being a report that talks about what we plan to do to a report that talks about what we did do.

So it will essentially become documentation for how we did approach the project as opposed to how we are planning to approach the project.

All right, just real quickly just to give you a peek inside what the TAAP will look like, it's

about 18 chapters long. The bulk of the second half of the report deals with all the individual scope areas of the study. For instance the internal events, the reactor events at-power, external hazards, et cetera. Low power shutdown. And so those are the main scope elements of the project.

The earlier sections deal with some technical elements that are in common to other areas of the study. So for instance system analysis, you would expect to have system analysis for almost any of the items on the right-hand column.

And so the general idea of system analysis is discuss early on in the report and then in the later chapters if there's something specific to that area that, in spent fuel pool or whatever, that you had to have some different type of system analysis work done then that would be described in that section.

So you have the more common part up front and then the more scope element specific parts at the end. And the last chapter in the report is the quality assurance chapter.

MEMBER POWERS: Can I just, you probably don't know this number but I'll just ask from an order of magnitude field. Do you have any idea how much of

your program resources are being devoted to quality assurance? You know, as a percentage.

MR. KURITZKY: I couldn't give you an estimate on that. I don't know, Mary, do you have any feel for that?

VICE CHAIRMAN RAY: Devoted is the right word.

MEMBER POWERS: I thought that was the word I used.

VICE CHAIRMAN RAY: Diverted is what you said.

MEMBER POWERS: I didn't intend to.

VICE CHAIRMAN RAY: Freudian slip.

MEMBER POWERS: It may have been a Freudian slip.

MR. KURITZKY: I mean I guess if you consider QA to be all the, well it's a little bit different. Certainly the reviews, we talk about the reviews being part of QA, then that's certainly a fair chunk. One of the other things as Mary mentioned before that QA plan involves a lot of format and templates for documentation.

Coming up with that took some resources but not a major amount of resources. The implementation of those by the staff members is

obviously much more resource intensive. But you can to yourself they need to come document this anyway, we've now given them a means by which to document it in a more formal, you know, consistent manner.

So I don't know if I'd want to count that as additional resources to QA. So I mean if we just talk mostly the reviews, I don't know. Maybe, I don't know, I don't want to stick myself, maybe in the five to ten percent range. I don't know. I just don't have a real good feel for that.

MEMBER POWERS: Yes, I understand, it's hard to know what is your QA and whatnot. I did have a chat with code developers doing some stuff for the Department of Energy under fairly restrictive QA requirements. And they were telling me that about 30 percent of their project funds were being devoted to QA.

MR. KURITZKY: Now for codes I would see that --

CHAIRMAN STETKAR: Code development though is different than this certainly.

MS. DROUIN: But I would have said more --

MEMBER POWERS: I would think this one's more difficult --

MS. DROUIN: I would have said more than

five to ten percent. I would have put this at a minimum of 25 percent. Because --

MEMBER POWERS: And I would think that that would be -- But it's like Alan says, you know, what goes into what pot is sometimes --

MS. DROUIN: Right. And I'm talking about just from a review prospective.

MEMBER POWERS: Oh, okay.

MS. DROUIN: And, you know, the QA is not just the tag. You know, it's not just the independent reviews, the self-assessment, you know, we, the management team, myself, Alan and Kevin at least 50 percent, if not more, of what we do is review. So when you start factoring all of that into account and looking at it, I would say 25 to 30 percent is on QA.

MEMBER POWERS: Yes, and that's the number they were giving. And again, I don't know how they decide where --

MR. KURITZKY: But I imagine with codes they probably have certain activities they're doing so they probably can track a little bit better than probably we can. But --

MEMBER POWERS: Well I suspect they can keep track a little better. But, I mean, you still have horrendous, you know, right hand not knowing what

the left hand's doing kinds of problems and things like that. Yes, are you doing a formalized systems engineering approach on this project management? Where you have control over your interfaces and things like that? Interface requirements and things?

MR. KURITZKY: You want to field on that?

MS. DROUIN: The answer is yes. I mean and it's approached in different ways, we have the TAAP and we've required, you know, for every scope item, for every technical element, for them to identify what all their interfaces are. And I hate to use this word but it's the only word I can think of. We have a checklist, which is quite extensive, that we require each technical lead to use. And I can't remember if they're -- They're signing off on the list, right?

MR. KURITZKY: The checklist is, I think project management is responsible for the list. We work with the originating --

MS. DROUIN: Sometimes I don't remember what we have in the form --

MR. KURITZKY: They sign off on the cover sheet for the report. They sign off on the cover sheet.

MS. DROUIN: But we have a very, very

detailed list that the project lead has to go through and check off. And so it gets into all these details that, you know, we may not always get to in a meeting. But we want to make sure that the technical lead is focusing on all of these things and doing them.

So he has to formally go through this and acknowledge that he has done this part, which is detailed in either their technical part of the TAAP or it's detailed in the QA part.

I mean like, for example, some major decision was made in a telephone call that can, you know, impact the results. Well they have to document that. You know, so all this little, lots of little bits of information that come into the decision making and everything, all of that can be traced and it's all documented. And all of that stuff we look at, myself, Alan and Kevin.

So we've tried to cover as best we can, you know, learning a lot of lessons learned from 1150, from SOARCA, you know, and other projects of how to ensure at the end of the day we feel confident on the technical acceptability and that we have a cohesive coherent model. That it, you know, it fits together and forms the picture that we wanted to hit and not some bunch of pieces of a puzzle that when you put it

together it makes no sense.

MEMBER POWERS: You don't have a trained system engineer working the project?

MS. DROUIN: You know, those words mean different things to different people. So I would be curious what they mean to you.

MEMBER POWERS: Certification from the National Society of Systems Engineering.

MR. KURITZKY: Like ISO-9000 type stuff?

MEMBER POWERS: No, none of that. You can get a certification as systems engineer from the International Association of Systems Engineers or something like, I can't remember exactly the organization.

MR. KURITZKY: I can tell you that we don't have someone like that on the project. The answer to that you know.

Okay. So before we go into the status of the various parts of the project I want to just give you a little bit of information about the volunteer site. The Vogtle site.

There is two units onsite. Two Westinghouse 4-loop PWRs with large, dry containments, Units 1 and 2, those are within the scope of the project. The two other units currently being

constructed, Units 3 and 4, are clearly out of the scope of the project.

With the Units 1 and 2 there are two spent fuel pools. But the two spent fuel pools are typically hydraulically connected almost all the time through the cask pit. So actually our intention is to model them as one large system as opposed to two separate pools.

Also, when it comes to independent spent fuel storage installations, the ISFSIs, there are two also. There is one inside the fence of Units 1 and 2, a smaller one that right now they're storing the fuel that they've just started offloading from the spent fuel pools. And that really is there while construction is going on to Units 3 and 4.

Outside that Unit 1 and 2 fence is where a larger facility is going to exist and that's going to take the fuel from all four reactors. So they'll up having two ISFSIs onsite.

Also another thing about the Vogtle site, it has a very atypical EPZ. Because the Savannah River site is just across the river it takes up a large portion of their EPZ and it's also very sparsely populated in other parts of the EPZ so you have a very, well I don't know if it's very unique, but

certainly a somewhat unique site in the fact there's a very low population density there.

Touching on what Dr. Powers mentioned before, we have the new seismic hazard models from the licensee that shows an increased seismic hazard from back in the IPEEE days. And, again, because of that the licensee is going back and sharpening their pencil on their component and structure fragilities.

In terms of external flooding, the plant is extremely high in elevation with regard to the Savannah River so there's virtually no chance of any type of river flooding there. So the only realistic concern with external flooding would be due to locally intense precipitation.

Also one thing that cuts both ways in terms of the integrated site risk is that the plant, the Units 1 and 2, are very independent and have virtually no shared systems outside the switch yard. And this one, Plant Wilson, which is I think a determined generating station. It can supply one electrical bus, safety electrical bus, on the site whether it be Unit 1 or Unit 2. So there is some connection there but in reality they're two independent units.

The advantage is it makes our work in

trying to identify dependencies and what we can do in terms of simplified modeling much easier for integrated site risk. On the other hand it doesn't give you the insights that you would get if you were doing integrated site risk modeling approach for a much more interconnected multi-unit site.

So going on to where we stand with the project today. First with the reactor risk assessment. The Level 1 at-power internal event and flood model, we have completed the R01 version of the model. That's the one that's going out for peer-review. We're going to have a peer-review of that, a PWR owner's group led peer review, in July. So next month.

We had to make several modifications, as I mentioned before, to SAPHIRE in order to put this model together because of the size of the model as compared SPAR models and because you want to link the Level 1 and Level 2 portions together, required us to do some changes to SAPHIRE.

Also as part of taking ownership of this model we wanted to look into where all the cut sets and the dominant contributors were coming from. As we dug more deeply in there we found additional things that we wanted to change.

Whether it's because we prefer it to model things along the SPAR convention so it was more similar looking to our SPAR models and what the staff is used to. Or whether because there was something in the licensee's model that we didn't have enough information to establish their technical basis for how they did something.

So we just decided to do something that we could defend at this point in time. Or it may just be a question where they did A, we did B. Both are okay but we just preferred B over A. So there's various changes that we made as we were going through the conversion and the model.

In terms of the Level 2, we are making very good progress there also. We have essentially all the pieces ready, pretty much, to do the Level 2 quantification we have. Quantify the plant damage states. We've done the MELCOR runs for the different representative scenarios for the plant damage states as well as a number of sensitivity studies.

We have the probabilistic logic framework all put together that contain the event trees and the decomposition of event trees that support it, have all been put together. We're right now finalizing the work on the Level 2 HRA. Once that's complete over

the next couple weeks we should be able to start the full pontification of the Level 2 model probably in the July, early July is when we're targeting.

And that we have planned to get a PWR owner's led peer-review for that in November of this year.

Moving on to the consequence analysis work. We have pretty much all the pieces that we need to to put the MACCS2 model together for the Level 3 PRA. Right now we're doing some initial shakedown of that model using some preliminary source term information that we have from the Level 2 folks. And we're hoping in the July/August timeframe to have the MACCS2 model ready for full production mode.

In terms of some of the initiators, the internal fire and the external hazards, we have completed our high wind model. That's already been integrated with the internal event model. So that one's complete.

We have a report in house, a draft report of that in house, that's currently going through internal review. Also the seismic, we have a preliminary seismic PRA model that's been completed. We've also integrated that into the overall PRA model now. We have a draft report that's just come in on

that that we're just starting to do the internal review on.

I say interim or preliminary for the seismic because, again, as we mentioned before we have the new seismic hazards codes that we are using. We are using the new fragilities that the licensee has prepared for their PRA but we still have not done a review of those in house. And so until we're comfortable with those it's really a tentative seismic model.

The internal fire PRA modeling is progressing. That's a much bigger chunk to deal with even though the licensee has done a peer-reviewed fire PRA. We don't have to do cable, you know, we don't have to do tracing all the cable routing or anything. But nonetheless, the licensee's fire PRA makes of CAFTA and the FRANC software. And they have about something on the order of 2,000 fire accident sequences.

So what we're doing now, we've reviewed their fire PRA and now we're starting to map those 2,000 odd fire sequences into roughly 200 or so fire scenarios to be used in our model. And each of those fire scenarios will be modeled with an event tree and will represent one or more of the fire sequences from

the licensee's PRA where we'll be grouping ones that have identical effect on the plant, or very similar effect on the plant just to minimize the numbers.

MEMBER POWERS: Do you have seismically induced fires in this PRA?

MR. KURITZKY: Seismically induced fires is something that was identified early on and was determined to be out of scope. So research has a separate project looking at that but it's not being reflected in this study right now.

MEMBER POWERS: Out of scope because it's not current practice?

MR. KURITZKY: It was not current state-of-practice, right. Exactly.

CHAIRMAN STETKAR: Seismically induced flooding?

MR. KURITZKY: Seismically induced flooding we left in that same category.

CHAIRMAN STETKAR: That is state-of-practice.

MR. KURITZKY: Well we -- depends whose practice. I mean there are a lot of PRAs out there that don't have it.

MEMBER POWERS: I think they get to determine that.

MR. KURITZKY: In any case, also for the other hazards we've already done our preliminary screening. Everything, including external flooding, has preliminarily screened out. We have an initial report on that also which is going through some internal review. And we're also taking a relook at a couple of the different hazards that we screened out. But we still also intend to have that peer-reviewed in November timeframe this year.

Getting on to the low power shutdown modeling, back as we were discussing with Dr. Powers earlier, we really haven't gotten that far along there. We just have an initial plan that's been put together, it really hasn't been vetted yet. So it's been kind of dragging along.

It's what I would consider to be the long pole in the tent right now. Primarily because of the diversion of the key personnel. The people that need to run that have been busy on other activities and so they really haven't had much time to put into that part of the model. But we're optimistic as the summer progresses we'll start to get a much stronger effort in that area.

Similarly with the spent fuel pool. That's one we did some initial work up front, we have

the scale analysis that was also done for the reactor and the spent fuel pool. We have a simplified MELCOR model for the spent fuel pool. And have done some initial sequence modeling, particularly dealing with large seismic events.

But, unfortunately, again because of the diversion of personnel it's been pretty much on life support for quite a number of months so.

MEMBER POWERS: Life support.

MR. KURITZKY: We've pushed the chest just enough to keep it from dying but we're still waiting for a miracle to allow resources to flow to that part of the study and get it moving at a more rapid rate.

The dry cask storage is going along much better than that. We actually have gathered and we do have all the information we pretty much need, or most of the information we need, for the study.

We had the opportunity to go down and observe the first loading campaign that they did at Vogtle back in November. It was a very productive visit. We got to talk to not only, the dry cast storage PRA Team got to see all the things that they wanted to observe as well as talk to the Holtec personnel which are, Holtec is not only the company that manufactures the casks that are being used, but

they're also the contractor that Southern Nuclear is using to do the loading campaign. So it was very production discussions that we had with both the Vogtle people and the Holtec people.

We've done some initial work on initiating an analysis. We've also started focusing, we've done a fair amount of work on the main scenarios which are the dropping of the multipurpose canister as it's going into the storage canister. Our HRA lead, our second HRA lead is leaving the project as of probably already. If not today, tomorrow or the next day. Maybe sooner than Steven Nolan is leaving, I don't know.

But so we're trying to rush in the work that he had observed and get that completed document before he walked out the door. We're pretty well along on that. We have someone else who's taking over now for the lead of HRA who's pretty much well briefed on the DCS/HRA works. We're really comfortable that we'll have a smooth transition there.

So we did move ahead on those one particular scenarios right now while we had the original lead available to do that work.

Longer term, we are having, as I mentioned before, Pacific Northwest National Lab is going to be

doing some structural analysis work for us on both the fuel and the cask itself. That worked because the various contracting issues and funding issues got delayed and delayed, so it's actually just getting started now. Probably in the next few weeks.

But whereas we were originally hoping to have that work completed in the September timeframe it now will probably not be completed until the end of the year. So the overall schedule for the dry cask storage PRA has been pushed from what we were originally thinking was the end of this year until the early part of next year. And the peer review will occur several months after that.

Integrated risk site risk assessment. We have proposed approach document in the TAAP, Chapter 17. As I mentioned before, we're using a simplified approach and plan to use the insights from the individual risk models to help focus and prune our model to capture everything we need to have but nothing more.

Also we are working right now on working on the dependencies, both within and between the different risk sources. In addition to that we're looking into common cause failure modeling, because one of the main things that's going to come out of the

integrated risk, particularly when we look at the two units, is the common cause failure of like equipment in both units.

And we already, for some equipment in single unit, we're pushing the group size limits for common cause failure now when we put the two units together we're coming up with some pretty large group sizes that not only are kind of exceeding the ability of the common cause failure methods to deal with but certainly the data is not there to support it. So that's something that we're looking into right now.

And that reminds me of something I meant to mention before. It was just echoing what Kevin had said before. In the Level 1 when I was talking about the internal events and there were certain that we were doing things differently than the licensee. One, as Kevin mentioned, was the IS LOCA modeling.

The IS LOCA modeling and the licensing PRA, typical to most PRAs, considers leakage between, you know, reverse leakage through check valves or motor operated valves, usually at least two in series like the primary fluid going into low pressure piping where it then is released outside the containment boundary.

Those are typically looked, the valve

failure rates are looked at typically individually. However, the current dataset that we have at Idaho that's used for SPAR models and other things, actually has data for common cause leakage past these check valves and motor operated valves. So we wanted to incorporate that into our model. In doing so we have greatly increased the IS LOCA frequency because this common cause impact is very substantial.

However we recognize that the values being used are driven by the data which is very sparse. And so therefore we've decided that we wanted to get an expert elicitation together to shed some more light and see how realistic that is, these common cause failure values we're using.

As Kevin mentioned, we have an SRM that tells the staff to pilot expert elicitation guidance with the Level 3 PRA Project, so this is the first one out of the box that we're going to use for piloting that expert elicitation guidance. There's likely to be more down the road but this is the first one that we're going to --

MEMBER POWERS: When you use expert, on a topic like this, and I understand why you're doing that and think it's a great idea, do you ask these experts what their opinion is or what they think the

opinion of the larger community is?

MR. KURITZKY: Well that's a detailed question, there is actually someone who can answer that question but I don't think she's here today. We have someone from another branch that's leading the expert elicitation work, Jing Xing, and she'll be the one that would know all the details of how we're going to structure the expert elicitation based on the new guidance.

Nathan, do you have something to offer?

MR. SIU: Nathan Siu, Office of Research. The short answer is yes. The approach is to look at the community and to try to represent the community state of knowledge. So that's the charter to the group.

MEMBER POWERS: Yes, I mean I think that's what you want. I'm never sure on it. Certainly in 1150 you were asked what the range of opinion of the larger community was. And that changed your answer a lot. And I think that's what you want, but I'm not absolutely certain that's what you want.

MR. KURITZKY: We'll that's what we're going to get so hopefully it will dovetail.

MEMBER POWERS: Yes, I mean, it sounds like a subtle point but it was not. In the 1150 it

was not. It definitely changed the distributions that people created because they were trying to reflect the larger community, and in general broadens them.

MR. KURITZKY: Right. And that's understandable. I would expect that, I mean --

MEMBER POWERS: Yes, I think that's -- The fanatic lunatic fringe out here. And then you got your opinion that agrees with you here.

MR. KURITZKY: Right. Right, the sane rational person agrees with you. Understand.

Okay. One thing I also wanted to mention in terms of status. I mentioned before that we're having, that one of the layers of review we're having some independent peer reviews done.

One aspect of those independent peer reviews are ASME/ANS Standard-Based peer reviews. And for these we've asked the PWR Owner's Group to lead those for us, because they have a lot of experience in that area. We engaged with them early on and we've talked to them several times. They got approval from their budget committee to support four peer reviews in calendar year 2014.

Three of those I mentioned, that's going to be the Level 1 internal event/internal floods. The Level 2 internal event/internal floods and the Level

1 high wind models. We don't actually have a fourth model ready for them to review in calendar year 14 so what we've decided to do is work with them to use that fourth peer review to develop review criteria for those areas that we don't actually have a standard to review against right now. And so that's particularly the spent fuel pool and the dry cask storage.

MEMBER BLEY: So you're not having a review of how you took the scenarios from the plant's own PRA and maybe adapted them or extended them as you brought --

MR. KURITZKY: For the fire you're talking about?

MEMBER BLEY: No, no. For the internal events.

MR. KURITZKY: Well these are --

MEMBER BLEY: Did they have a PRA on the internal events?

MR. KURITZKY: That is the peer review in July. And they're focus --

MEMBER BLEY: Oh that is the July one.

MR. KURITZKY: Yes. And that's going to be --

MEMBER BLEY: I didn't hear you say it, so okay.

MR. KURITZKY: Sorry. And that's going to be a focused review specifically on what we've changed from the licensee's PRA.

MEMBER BLEY: Yes. Okay. That's what I thought, so I missed that.

MR. KURITZKY: Sorry. Yes, I was speaking very fast.

MEMBER POWERS: It was nothing like that.

MR. KURITZKY: So those three are covered and the fourth one will be with the spent fuel pool and dry cask storage review characteristics.

Okay. You've heard me allude to these all along throughout the presentation, challenges, challenges, challenges, schedule delays. So I pretty much put these into two main categories, administrative challenges and technical challenges.

And under administrative challenges we clearly have funding availability. I would say in reality, in hindsight, it hasn't been so much funding availability as it has been funding reliability. I mean the funding has in most cases ultimately been restored to us. But at the time that we need we're told we don't have it.

So contracts get written, scopes of work get written. Contractors get turned on to a more

reduced piece of work. Then all of a sudden down the road money miraculously reappears, then we're told oh you have more money. But now we have to go through all kinds of contracting changes. Sometimes the contracts were already set out because we were already out of funds. And so it has not been very efficient in the turning on and off of the spigot.

MEMBER POWERS: Re-scoping is expensive.

MR. KURITZKY: What's that?

MEMBER POWERS: Re-scoping is expensive.

MR. KURITZKY: Yes it is. Yes it is.

MS. DROUIN: Modifying any contract takes a lot of time, it's not something simple.

MR. KURITZKY: Right, something congress doesn't really understand. But that's a different meeting.

The other thing that actually has been more, I think has had more negative impact on our schedule has really been the staff diversions. Particularly the key personnel.

As you can see on this list there's a number of high-priority activities that are occurring in the Agency right now that all need the attention of some of the more experienced PRA analysts here, or the structural analysts. Or the consequence analysts, the

thermohydraulic analysts.

So these people who are principle players on our project are constantly being pulled off to work on these other myriad of issues. And as such we have, again as I said before, we're having a hard time getting all the right people in line working at the right time to get really good progress. We're making --

MEMBER POWERS: We've been helping you on that.

MR. KURITZKY: What's that?

MEMBER POWERS: We've been helping you on that.

MR. KURITZKY: Appreciate that. If you could recommend all these other projects get cancelled, that would actually be really helpful. But in any case, so that's obviously something that's been a big concern for us.

The last one I put on here deals with getting information from the licensee. I want to stress that the licensee has bent over backwards to get a tremendous amount of information. Knowing this project going in, both the licensee, Southern Nuclear and the staff recognized that there would be a lot of information that we would need for this project and

were planning for that.

However, in practice, because of the broad scope the amount of information needed and the amount of effort it takes to dig up that information at the plant was way more than any of us had expected. And quite honestly we're really stressing out the licensee in terms of resources, getting information.

So the information coming I see has definitely trickled down over the life of the project. They're still working hard to get us stuff but they honestly only have so much time and resource they can put to that so that's a challenge that we just have to deal with.

We're working with them on a constant basis to try and figure out how we can prioritize what we need and minimize what we need but it's an ongoing challenge.

Moving over to some of the technical challenges that are impacting the schedule. This first item, and actually more of a technical/administrative one combined. But the infrastructure that we discussed before, there was a lot of effort put into putting together infrastructure so that delayed the start of the technical work for quite some time at the outset of the project.

However, we believe that getting all these things in place up front will pay dividends down the road by minimizing problems. I think it's important to have that structure established given that there's so many pieces to this project.

Another one I've already touched on before too, is in converting the licensee model, which was in CAFTA over to SAPHIRE there were a number of issued involved with that. One of the first things that really was a problem was that we got the licensee's CAFTA model early on, relatively early on, and we wanted to convert it over to SAPHIRE. And then we realized we can't do that until we get our license from EPRI to get CAFTA.

So as Mary has mentioned no commercial action goes quickly. And we had to do a rush commercial action to get CAFTA and some supporting software that goes along with it. So that knocked us back a few months right there before we could even get the in house. And then we were able to do the conversion.

After we did the conversion, as we mentioned before, there was a number of things as we started digging through the results and trying to make the model our own, we kept finding areas that we

wanted to change for one reason or another we wanted to adapt them to something we were more comfortable with. And so that ended up taking a lot longer than we had anticipated too.

So some of the, as I mentioned early on, having the PRA pieces that were already performed by the licensee was a big leveraging aspect for us, was supposed to be a big savings for us. And it still by all means definitely was, but not as much as we initially anticipated because we ended up having to do a lot of changes to our own models.

This schedule right here, this was the schedule I think we put together in February. It's relatively accurate, it's already probably slipped a little but from what was on, you know, just a few months ago. I don't want to go into the details of all the pieces. I mentioned the low power and shutdown is kind of the long tent in the pole right now.

But also I at least want to point that the overall schedule that you see in the very bottom there is now pushed out to July 31st, 2017. The original target date was March 31st, 2016. So we're about 16 months behind schedule right now. I honestly don't expect us to make up any ground. If it goes anywhere

it's going to go the wrong direction.

Some of the key milestones, some of the things we've accomplished or are going to accomplish this year, this calendar year. We have the Level 1 seismic model, like I mentioned we already have a preliminary version of that model completed. We're just waiting to do some review of the fragility information.

The next few items on there are all the peer reviews that we just talked about that are going to occur this year. The internal event and flood one, Level 1 in July. The Level 2 one in November. And then also the high wind model in November.

We hope to have the Level 3 consequence analysis portion for the internal event and flood done by the end of the calendar year or early into 2015. And then we'll have the peer review of that a few months later.

The dry cask storage we already discussed. We hope to have that done in early 2015 also.

Some of the major meetings and briefings coming up in this calendar year. In September we have our annual briefing for the Commissioner TAs to give them the status report of the site and also some of the preliminary results.

We're planning to go back, as Chairman Stetkar mentioned, in October, mid-October, to discuss more about probably the Level 1 and Level 2 PRA efforts.

We'll probably have an open session that goes over the general stats of the project and a closed session that will get more into the details of the Level 1 and Level 2 modeling that we've done so far, because that will involve a lot of pre-decisional and proprietary information that would probably be closed.

We also plan though to have a public meeting later in the year just to give the public an update on the project status and preliminary results. And also that will give us a chance to provide the public any particular questions or issues that we specifically want their feedback on, we can do that at that time.

So wrapping up. Again, as I mentioned the schedule, about 16 months behind schedule. Unless miracles happen our key personnel are going to continue to be diverted and I imagine that schedule is probably going to slip further.

The good thing is we have a very robust infrastructure for the project. I think we have a

very strong foundation on which we're building all the models. We've had very good collaboration with the licensee and that's very important for leveraging their models and also getting access to the site and all the information that we need.

We've had very successful inter-organizational collaboration. Most, a majority of the work, not most I wouldn't say. But the majority of the work has been done in-house. We've had important contributions from all three divisions in the Office of Research. We've also had good support from some of these other offices in the Agency, particularly NSIR with the EP modeling and with NMSS for the dry cask storage. They've been actively involved.

And the other thing we've also been very successful, consistent with one of our objectives, one of our objectives was getting mid and junior career staff involved in the work and they're getting their hands dirty in PRA and getting that experience.

As we mentioned progress is being made in all technical areas of the study, there are obviously a couple that are lagging. Spent fuel pool and low power shutdown being the two most obvious. But nonetheless everything is moving forward at a fairly decent rate.

But again my parting comment for the umpteenth time, the diversion of key staff is really the thing that it's that Sword of Damocles or whatever it is that hangs over your head, you know, and chop our heads off. So anyway, that's something that we just have to deal with. Constantly. So questions?

CHAIRMAN STETKAR: Any of the members have any questions for the staff?

Alan, Mary, Kevin. Dennis, do you have a question?

MEMBER BLEY: No, no.

CHAIRMAN STETKAR: Oh. You have the room. Stopped me mid-sentence.

I wanted to thank you. You covered an awful lot of ground in a relatively short period of time. We're happy for the fact that Alan speaks more quickly than most of us. And Dr. Powers has finally had some neurons fired.

MEMBER POWERS: One of the topics that you did not explore in any detail was the uncertainty analysis. And I've just recently had some opportunities to review some phenomenological models, uncertainty analysis. And what they're doing is parameter uncertainty.

I have lots and lots of quibbles with

that. But more important and germane thing is are you going to ask these people, especially in phenomenological models, to do model uncertainty?

MR. KURITZKY: Okay. So I thank you for that comment, because I had a talking point written on my sheet that I never got to. Thank you, I appreciate that.

MEMBER POWERS: I saw it and I thought I'd bring it because you hadn't covered it and I knew you were supposed to.

MR. KURITZKY: Good straight man. So going back to the June ACRS letter to the Commission, the other thing that ACRS recommended was that the study not rely on undue or extremely conservative assumptions. And also that they identify and address uncertainty.

And so consistent with that we have a focus to avoid excessive conservatism where we can. And also we do have a focus on both propagating parameter uncertainties, in the Level 1 and Level 2 models, and also identifying model uncertainty and identifying those candidates for potential sensitivity studies.

And that's one of the things I think that TAAP itself as one of the things the guides was that

we had to identify what they felt were their areas of uncertainty. So that is definitely a focus of this project.

MEMBER POWERS: Okay. Okay. Because, you know, in looking at these uncertainties, a great deal has been made about, for instance interfacing system, LOCA or some of these other models. And, you know, they make assumptions in those models in developing those code calculation about the plant configuration at the time that have been made so many times that they've ossified into truth and in fact are not true.

MR. KURITZKY: Right.

MEMBER POWERS: And it leads to model uncertainty. And there's just no way to get at it with the parameters because the parameters are under the prejudice of this perceived truth.

MR. KURITZKY: It leads to false confidence too.

MEMBER POWERS: And even if you can't address it, what you're saying is identify it and maybe you can do something about it, at least flag it. Because sometimes addressing that is a project in and of itself.

MR. KURITZKY: Right. And what we'll do is when we identify them we'll either have, either

they'll be candidates for sensitivity side which we may or may not be able to address within this project. Or, barring that, they'll be candidates for future research, you know.

MEMBER POWERS: Yes, I mean, that's fair. That's fair. I mean, within the parameter uncertainty undoubtedly we'll get a chance to talk about what I see some prejudice emerging in that area that I think are questionable. But at least we know what we're doing there.

MR. KURITZKY: Okay.

MS. DROUIN: You know, everyone is required all their sources of uncertainty. Part of the trick though is we want to make sure, you know, sometimes it's hard to distinguish between a source of uncertainty versus a decision you made on the level of detail you want to model. And that's just a convention or simplification and not necessarily a source of model uncertainty.

And my point is sometimes that line is blurred. So we want to make sure that things that did not get listed truly were, you know, simplification decisions. Because the scope or the money just, we didn't need to go to that level of detail.

MEMBER POWERS: In some cases, I mean, I

understand your point, Mary. In some cases I think, especially in the phenomenological model, and it may be more pervasive than I think, but in the phenomenological modeling I'm reasonably familiar with, people running it because literally were not present and are unacquainted with some approximations and simplifications that have been adopted. And they just don't know.

And it's no criticism of them so much as the fact that what they have documented and written down is finite and never comprehensive. And these things get forgotten and your TAAP may be good at reminding people of assumptions they --

MR. KURITZKY: Well we're not going to guarantee we'll get 100 percent of them. But we're going to try.

MEMBER POWERS: No, no. You cannot. And nobody thinks you would.

MS. DROUIN: And a good source, and a good reference I should say is that a lot of detailed thinking went into this and the development of the collaborative effort between NRC and EPRI on NUREG-1855 and that the EPRI part of that project was to go through and in detail identify, now it was generic, but what are all the sources of modeling uncertainty

that you know you have for systems analysis, for Level 2, the different technical elements in the Level 2.

So that's a lot of time went into the development of that list. You know we had a three day workshop that also we brought in people from all over the industry on some of these elements. So that I think is going to be very helpful in us trying to get a good handle on documenting what are all the sources of uncertainty.

MEMBER BLEY: I'd like to go back to the one thing you two were just discussing. This business of simplifications and assumptions I think the obligation lies there is to try to document them, to revisit them and make sure that what you thought was a simplification was in fact --

MS. DROUIN: Exactly. That was my point.

MEMBER BLEY: -- that and that it isn't, that there's not some uncertainty hiding there because of that assumption.

MS. DROUIN: We wanted to make sure did not get -- Right. That something didn't get screened out on that that should not have been screened out.

MEMBER BLEY: Perfect.

MS. DROUIN: And that to me is going to be the trick, because you know it's screened out and so

--

MEMBER BLEY: They're hard to find. Even when you try to keep a list of them they're hard to find.

MS. DROUIN: Yes. Yes. So we haven't finished rocketing that part of TAAP on how to deal, how we're going to deal with all these uncertainties. So that is stay tuned.

MEMBER POWERS: Well I think what Alan says is correct. You deal with the ones that you can and flag the ones that you can't.

MS. DROUIN: Yes.

MEMBER POWERS: And if you do that then you've done a real service to the community.

CHAIRMAN STETKAR: Anything else? Hearing nothing let me ask if there are any members of the public or anyone else in the room who would like to make comments on what we've heard.

If not I believe we have the bridge line open. I don't know if there's anyone out there and I always have to say this, because we have different audiences for different meetings, if there's someone out there just please say something so we can confirm the bridge line is open.

MR. LAUER: Yes, this is Steve Lauer.

CHAIRMAN STETKAR: Thanks, Steve.

MR. LAUER: And I have no comments.

CHAIRMAN STETKAR: Okay. Thank you. Now if there's anyone, and we've confirmed the line is open. If there is anyone out there who would like to make a comment please identify yourself and do so.

PARTICIPANT: This is Amir from Southern Nuclear. I just want to congratulate the Level 3 PRA guys on the excellent work they're doing. We are working very closely with them. They have a huge task in front of them and they need all the help they can get from you guys.

MR. KURITZKY: Thank you, Amir.

PARTICIPANT: This is Tina, I want to say after --

CHAIRMAN STETKAR: Tina. Tina. Tina. Hold on a second. First of all you're breaking up a little bit, so if you're on a speaker phone use a regular phone and speak a little bit more clearly.

PARTICIPANT: Okay, sorry.

CHAIRMAN STETKAR: Much better.

PARTICIPANT: Okay, great. Sorry about that. There was question on what version of MELCOR was used for SOARCA and I just wanted to clarify that it was 1.86 for the base SOARCA analyses and we

migrated the models over to version 2.1 for the uncertainty analyses.

CHAIRMAN STETKAR: All right. Great. Thank you, that helps clarify things.

Anyone else that would like to make a comment. Hearing none. Again, I'd like to thank the staff. You covered a lot of ground in an hour and a half and I really appreciate that.

And with that we will recess until 3:30.

(Whereupon, the above-entitled matter went off the record at 3:17 p.m. and resumed at 3:31 p.m.)

CHAIRMAN STETKAR: We are back in session and the next topic is going to be an overview of NRC's Regulatory Analysis Guidance and Harold Ray will lead us through that. Harold?

VICE CHAIRMAN RAY: Thank you, Mr. Chairman. During our review of the expedited spent fuel transfer Members, including me, requested additional information about how socioeconomic factors were used in Agency decision making.

In part, this informational briefing by staff is responsive to that request. More importantly, however, there's an ongoing long-term effort underway by staff to update Regulatory Analysis

Guidance which addresses the use of these factors.

This informational briefing will summarize that process status as of now. The Committee was last briefed in meetings in October and November 2012 and we provided in our input in our letter dated November 13, 2012.

I have today provided copies to Members of that letter for information. I also provided some extracts that I thought might be pertinent to the discussion today and tomorrow, also, where we'll be talking about this.

Given the number of slides we can only average less than four minutes by my calculation per slide. I want to make a few comments now in advance in the interest of efficiency.

This updated Regulatory Analysis Guidance was addressed by the Commission and SRM issued in March 2013 and by the staff in a SECY issued in January 2014.

Although the expedited spent fuel transfer decision's behind us there is near term complicating factor that I want to highlight, which is likely to cause some angst as we look to the longer term update of the plan, update plan.

This near term complicating factor was

addressed in a separate SRM, which was also issued in March 2013. It involves consideration of additional requirements for containment venting systems for BWR Mark I and II containments and we will have a subcommittee meeting on this which is currently scheduled for August 18th.

The staff presentation will make that look like it's part of the broader subject, but it's really about containment venting. Because there are many issues in deciding on these requirements which are specific to Mark I and II BWRs, I'd like to be able to keep this topic completely separate from the plan to update the Regulatory Analysis Guidance.

Unfortunately it's impossible to do this, but, nevertheless, I ask that we try to the extent that we can and not simply assume they are the same. In the first place the Commission SRM on Mark I and II BWR containment venting includes direction for staff to address so-called qualitative factors in a notation vote paper.

Although the Commission SRM says this is to be independent of the containment filtration issue, the staff SECY says that a notation vote paper will be submitted two months after, two months following the issuance of the Commission SRM on Recommendation I.

As everyone knows, this SRM was issued on May 19th of this year. So, although we will be talking about a broad two-phase long-term program today, key elements are likely to be addressed by the staff to the Commission next month.

Most importantly, as will be shown in Slide 9 of today's presentation, these elements have been linked to the very specific and very short-term containment vending matter that we will review in an important subcommittee meeting on August 18th.

Although I know staff cannot tell us today what they will include in next month's notation vote paper on qualitative factors, I hope they can suggest to us how to reconcile these two matters, talking about the long-term and the short-term, especially since the Commission directed that the issue of qualitative factors be addressed independently of the containment vending issue.

I'd also value any comments from the staff on the impact, if any, on their January 2nd plan for updating Cost Benefit Guidance of the Commission Resolution of Near Term Task Force, Recommendation I and if any impact of that impact would be addressed in the notation vote paper.

And, finally, for the Members'

information, we expect to discuss this, both of these topics, at some length at tomorrow's P&P meeting, so this is a good opportunity for us all to get on the same page before doing so. That's in advance of the August 18th meeting that I mentioned.

Now, I believe Alysia will start because she has a plane to catch and we need to respect her need to get out of here by 4:30. With that, any comments are invited, or we can begin.

MR. BAHADUR: Thank you, Mr. Ray. Before Alysia starts I just would like to say my name is Sher Bahadur, I am the Deputy Directory, Division of Policy and Rulemaking at NRR.

And as Mr. Vice Chairman mentioned, this briefing is going to be in two part. The first part we are going to just focus on our plan for updating the guidance on the cost benefit and Alysia will do that, and as Mr. Ray recognized she has a plane to catch so while she's making presentation if you have any questions you can just interrupt her during that time or soon thereafter. The second part --

VICE CHAIRMAN RAY: As long as it doesn't delay her past 4:30. Go ahead.

MR. BAHADUR: Yes, sir. And then the second part is going to be more like our existing

practice on the Regulatory Analysis. It's a kind of detail topic and it's a topic which may require a little longer time to present to you and discuss.

Fred Schofer is our Cost Analyst and he is going to be providing that briefing to you where there are so many slides that, as Mr. Vice Chairman mentioned, four minutes or maybe a little less per slide.

So with that, although I had about 16 pages of opening remarks, but I won't make any, but with your permission, Mr. Chairman, I'd like to place a personal note here, and effective June 30 I will be taking retirement from the Government service after 30 years and during this time there have been several occasions where I came to the Committee, I worked in NMSS at the time and the Waste Management was going to site selection and the ACRS was going through the offshooting at AC&W and that time I was at the Chairman's Office so I interacted very closely with the Committee.

I went to Research and then I came to you several times during that time as well and finally now in NRR, and between the Research and NRR I actually served the Committee as a Deputy Executive Director.

So I leave this Agency with very fond

memories of the people that I work with, but particularly with this particular Committee because of the support that I received from you during these 30 years period.

So thank you so much, and with that I change to Alysia.

VICE CHAIRMAN RAY: Best wishes to you.

PARTICIPANT: Best wishes.

(Applause)

CHAIRMAN STETKAR: Sorry to see you go.

MR. BAHADUR: I'm looking forward to going, but I am going to miss all of you. Alysia, please proceed.

MS. BONE: Thank you. Thank you very much, Sher. Thank you, Committee. I appreciate the opportunity today to talk to you and I also thank you for your help and flexibility in helping catch my plane, so thank you very much.

CHAIRMAN STETKAR: You can be assured that we're going to make your life just about as miserable as we can.

MS. BONE: Okay, wonderful, I'm looking forward to it.

MEMBER RYAN: You might want to watch that microphone because it kind of sets off a rocket in his

ears.

MS. BONE: Okay. Oh. Thank you for the warning.

MEMBER RYAN: You bet.

MS. BONE: So it was mentioned the purpose of our briefing today is to first provide you an overview of our plan for updating Cross Benefit Guidance and that was in SECY-14-002, and the second part of the plan, which the presentation which Fred will cover, will be to provide an overview of just the current staff practices regarding regulatory analysis.

So a brief overview for the first portion, I'll give you some background notes, just a reminder of how we've gotten here today. I'll go over some feedback, or the interactions we've had with the public, and then I'll talk mainly about the plan itself, specifically focusing on some, the deliverables that you'll see later on this year.

And then I'll discuss just a few points on the Price-Anderson Act, which was also included in our SECY paper and then I'll hand it over to Fred to discuss regulatory analysis.

So first just a quick overview of the SECY itself. We did submit this SECY paper, Plan for Updating U.S. NRC's Cross Benefit Guidance on January

2nd of this year. We accompanied a blog post with that just to make sure members of the public who had been following this effort knew about it.

This is an information paper so we did not address any policy issues in this paper, rather we put forward a high level implementation plan for a two phased approach for updating our guidance holistically and we identified a mechanism or a method for bringing policy issues on this subject to the Commission in the future.

This work represents, even though I'm here today, I'm the Project Manager in NRR, this work does represent the entire agency. We have a working group comprised of seven of the offices of the NRC, including the Office of General Counsel.

So we are in this effort trying to, the best of our ability, harmonize across business lines and make sure that we are seeing abreast of other activities within the agency.

VICE CHAIRMAN RAY: Well let me just say, the last bullet there about policy issues, I understand why you say that, but it does provide for this notation vote paper within two months of Recommendation I.

MS. BONE: Right.

VICE CHAIRMAN RAY: My expectation is that that's going contain some policy.

MS. BONE: Absolutely, yes.

VICE CHAIRMAN RAY: And, therefore, to the extent it's discussed in here, including like on Slide 9.

MS. BONE: Right.

VICE CHAIRMAN RAY: To say it's not part of the papers, it's kind of a semantic distinction.

MS. BONE: Sure.

VICE CHAIRMAN RAY: We have to view it as including policy at this point in time. So, go ahead.

MS. BONE: Sure. I appreciate that, yes.

VICE CHAIRMAN RAY: All right.

MS. BONE: Thank you. Just a quick reminder of the background. The accident at the Fukushima-Daiichi Nuclear Power Plant initiated questions regarding how the NRC considers potential economic consequences of a nuclear accident within our regulatory framework.

There was some misconceptions that the regulatory framework does not at all consider such potential impacts. So in August of 2012 the staff submitted SECY-12-0110, Consideration of Economic Consequences Within the U.S. Nuclear Regulatory

Commission's Regulatory Framework, and this addressed the policy question of to what extent, if any, should NRC's framework modify consideration of economic consequences of the unintended release of licensed nuclear materials to the environment.

And in this paper the staff set forth that we do consider economic consequences in the form of the offsite property damage attribute within cost benefit determinations.

And these cost benefit determinations are used throughout the Agency within primarily three analyses, regulatory analyses, backfit analyses, and environmental analyses, specifically SAMA and SAMDA under NEPA.

And, of course, these are beyond us reactors, they're across all business lines and regulated activities within the NRC. The key here, though, that we showed in the paper is that even though this cost benefit determinations are throughout the Agency there are a few core guidance documents that are used throughout all of cost benefit determinations, specifically the Regulatory Analysis Guidelines, NUREG/BR-0058, and the Regulatory Analysis Technical Handbook, NUREG/BR-0184.

VICE CHAIRMAN RAY: What does the "BR"

stand for?

MS. BONE: Brochure. So bearing that in mind that these are used throughout the Agency and they had not been updated in several years, the staff noted in this paper that the regulatory framework is sound and affords sufficient flexibility for considering economic consequences.

However, we recommended updating and revising our guidance to enhance, just generally, our cross benefit guidance to harmonize across business lines to make sure that we are considering it as a, you know, state-of-the-art, and making sure our guidance are as up-to-date as possible. This was Option II of the paper.

In March of last year we received the direction from the Commission, SRM-SECY-12-0110, and the Commission approved our recommendation for enhancing our cross benefit guidance and noted that matters of economic consequences should not be equivalent and regulatory character as matters of adequate protection.

VICE CHAIRMAN RAY: Whatever that means, but go ahead.

MS. BONE: The Commission did provide us several tasks that we needed to accomplish, one of

which was to provide a paper so we make it clear how our guidance would help harmonize regulatory practices and regulatory guidance across the Agency in consideration of economic consequences.

And there were several sub-parts of that paper, as noted here. We needed to identify, obviously, what activities would be impacted, how we would modify our priorities, how we would consider practices from other federal agencies as well as international bodies, and, lastly, how this option, this approach, may influence our future recommendations to Congress regarding the renewal of the Price-Anderson Act.

Throughout both the development of SECY-12-0110, the original EC, Economic Consequence paper, as well as the follow up items on cost benefit guidance. We've had several interactions with the public.

You can see right here we've had four public meetings on this, the summaries are noted here. And, as was mentioned in the introductory remarks we met with the ACRS in October and November 2012.

We had a Commission meeting on this subjection September 11, 2012, where we had external panelists from the U.S. Environmental Protection

Agency, Union of Concerned Scientists, American Nuclear Insurers, Health Physics Society, and the Nuclear Energy Institute.

So that's quickly on background. Before I get into the meat of the plan itself that's in the paper are there any questions that I could answer? Okay.

VICE CHAIRMAN RAY: I mentioned, I just want to remind, if you can work into what you're going to say what you assess the impact of the Recommendation I decision to be that would be helpful.

MS. BONE: Okay.

VICE CHAIRMAN RAY: We can talk about that later after you've gone as well.

MS. BONE: Okay.

VICE CHAIRMAN RAY: But if you have anything to say about that I'd appreciate it.

MS. BONE: Thank you. I'll make a note of that. So in the next few slides I'll go over the sort of key points that were in SECY-14-002. First, the next two slides, Slides 8 and 9, talk about current cost-benefit initiatives, or those that were current at the time of the paper, and other related activities.

One of the things we wanted to do in this

paper was really provide a roadmap showing that even though there are many activities, not necessarily under the auspices of cost-benefit initiative, that there are many activities going on within the Agency that could inform our plans and update our guidance.

And this again gets to the intention of better harmonizing across the Agency. So we made a list here of six activities that we can envision will influence our guidance or are directly related to our guidance.

The first is an update to the replacement energy cost. a NUREG. This addresses cost for replacement energy on a short-term and long-term basis. This was an ongoing activity. We made note of it actually in the first SECY paper, SECY-12-0110, and that's still an ongoing activity.

We're expecting a draft NUREG later this year, depending on resources and other competing priorities, but we're expecting a draft NUREG later this year and that will go through the normal process of publication for comment and then finalizing it in a final NUREG.

One thing I'll do as I walk through this is hopefully kind of identify areas where ACRS may be interested in providing a letter, specifically I think

it'll be many of them, but we, you know, our attention is to come to you on, respective to each topic and to focus on each of these topics.

And so I think this is one as we begin to finalize NUREG, or certainly in the comment period, we could come to you and provide more information on this, yet to be scheduled, of course.

The second item here is the update to the dollar per person-rem conversion factor policy. This is in NUREG-1530. This was another one that was an ongoing item that was noted in our previous paper and this is our guidance for monetizing the health detriment and we are not only updating that factor itself but also establishing a process for updating it more systematically in the future.

Both sort of just re-based, lining it based on new information as well as keeping it current based on yearly economic indices, et cetera.

MEMBER RYAN: Just a quick question, too, on that. How are you going to assess age dependence across a population and other issues like susceptibility and all those kinds of things.

How are you going to come up with a, I guess an age-weighted average dose or something like that? Howe do you do it? How are you going to deal

with that?

MS. BONE: Currently we, so this is still in process, of course. As you know, the dollar per person-rem is the value of statistical life multiplied by the cancer, or cancer conversion coefficient.

So right now, we've talked with other agencies, some use the value of statistical life year, we have not used that, we use the value of statistical life so it's the same across, same VSL for all the population, and so we don't delineate it that way.

Right now it's currently $3 million for the value of statistical life. So in that way we're not --

MEMBER RYAN: What's that $3 million based on?

MS. BONE: It's based on willingness to pay studies. Essentially the idea is that there are several different kind of survey studies, well willingness to pay studies can be either survey studies sort of surveying the population of how much are you willing to pay to reduce your risk by "X" amount, that kind of a thing.

Or it can be derived by looking at sort of wages, how much historically you're willing to be paid to, you know, kind of take on a certain amount of

risk, like say, you know, particularly dangerous job, window washing, you know, just sort of in general.

MEMBER RYAN: Smoking?

MS. BONE: Well --

MEMBER RYAN: That's a self-induced --

MS. BONE: Yes, right.

MEMBER RYAN: -- risk which is probably one of the larger ones we have to face.

MS. BONE: Yes, right. Right, exactly.

MEMBER RYAN: I guess it's interesting, I mean I share the fact it's not an easy problem to solve, but to me there's no such thing as a dollars per person-rem, if it makes any sense.

MS. BONE: Yes.

MEMBER RYAN: Because it's so far across a wide range that you're really, you know, you're really kind of making up a metric rather than using something that's derived from data. That's just my thought.

But I offer you that to think about, you know, that it's something not very useful in the fact it's such a broad range of people, of lifestyles, of habits, and all that kind of stuff that you end up with, you know, a gazillion bins that people are in across that and I wonder what that really means at the

end. So just something to think about.

MR. SCHOFER: But in response to your question the current dollar per person-rem is based upon the 40-year-old. So there isn't that, you know --

MEMBER RYAN: And a 40-year-old is generally healthy. You know, that's not yet, you haven't really started to, you know, take the deep slide yet at that point.

MR. SCHOFER: Yes.

MEMBER RYAN: So I'm not sure what that means.

MR. BAHADUR: Yes, and it's a person --

MEMBER RYAN: Unless it's properly accepted, of course.

VICE CHAIRMAN RAY: The comment's been made -- I'm sure you receive it and I think we should move on.

MS. BONE: Thank you.

MR. BAHADUR: It's a very interesting topic, frankly --

MS. BONE: It is.

MR. BAHADUR: -- and as Alysia said these are some of the activities which are of the horizon and right now our object is just to let you know the

projects which were coming to your attention in the near future.

MEMBER RYAN: Well I'll look forward to that one.

MS. BONE: Yes.

MR. BAHADUR: And we are talking to various agencies to find out exactly what methodologies they've been using and Dr. Anderson, remember at one long time, for a long, long time, his agency has only $1000 a man-rem.

And that's used to combine a lot of information and a lot of factors with literally no quantification to those factors at all. And that $1000 a person-rem lasted for almost 20 years before the Commission decided to go and revise that to $2000 a man.

And even now today as you said, a 40-year-old person, which once upon a time used to be considered over-the-hill, now has not even climbed the hill. So I mean the factors do change quite a bit and the staff are looking at that.

MS. BONE: Okay.

MEMBER RYAN: Excellent, that's good. Thank you, I'll look forward to the follow up.

MS. BONE: Thank you. Yes, we look

forward to coming back to you to discuss that, specifically the --

MEMBER POWERS: Oh, I can tell you look forward to that one.

MS. BONE: I do. I do. It's a challenge, but one, you know, very important for us to communicate. That, also, the draft is expected later this year in the same sort of process as the replacement energy cost.

The third one we have here under the cumulative effects of regulation this is one specifically that is not under the cross benefit "initiative," it's under the cumulative effects of regulation initiative but it has a direct link to how we update our guidance.

The Commission directed the staff to work with industry on case studies to review the accuracy of NRC cost estimates and schedule estimates and these insights may inform our Cross Benefit Guidance updates in general.

The NEI did provide a final report with the recommendations during a public meeting earlier this year and so the working group is sort of seeing what insights and lessons learned we can incorporate in our guidance in general.

Here are three more that were specifically, Sir Vice Chairman, you mentioned that our initiatives that are related to the cost-benefit update even though they're under their own activity, the first is the NTT of Recommendation I activities as was noted.

At the time we had not received the SRM when we provided this paper. There were, of course, three different initiatives that the staff proposed and the implementation for a number of them, if not all, mentioned implementing them in updates to the cost-benefit guidance.

I would, you know, Fred, Sher, feel free to jump in sort of addressing the question of how this can, the SRM has come out since we've since the paper will change our plans.

I think we're still sort of processing that. One thing that we noted in the paper itself is that this was directly related to the second item, qualitative factor, so maybe I'll just continue to finish up these items in general and then we can talk about them because they're so related.

VICE CHAIRMAN RAY: Yes. No, that's right.

MS. BONE: Yes.

VICE CHAIRMAN RAY: The second item here, of course, is the more immediate thing.

MS. BONE: Yes, absolutely.

VICE CHAIRMAN RAY: And so why don't you go ahead.

MR. SCHOFER: For a couple points on NTTF-1. Originally it was tied to the qualitative factors papers because of the second recommendation had to do with defense in depth.

MS. BONE: Yes.

MR. SCHOFER: However, the Commission directed, you know, the staff to document so that we're not losing the defense in depth history, but not to do any other action associated with that and pretty much directed staff to treat most of what was addressed in NTTF-1 as part of the risk management regulatory framework, which is looking, you know, across the Agency, you know, how our framework might change, you know, ten years, 15 years --

VICE CHAIRMAN RAY: Yes. There's many more ramifications to the decision on Recommendation I than just how it affects the January 2nd plan that you're discussing.

But I was just asking specifically how it affected the plan and you're saying you're still

looking at that --

MR. SCHOFER: Correct.

MS. BONE: We are.

VICE CHAIRMAN RAY: -- and we don't have any specifics. You may have a specific coming up next, though, which is this 2-month commitment that was made in the January 2nd SECY, so go ahead.

MS. BONE: Right. Right. Exactly. So just to recap, the qualitative factors paper, this came directly from the SRM on filtration strategies, separate entirely from the containment venting topic.

The staff should seek detailed Commission guidance on its use of qualitative factors. So --

VICE CHAIRMAN RAY: But how did it get tied to two months from Recommendation I, because that's really creating heartburn for us?

MS. BONE: I think that the --

MR. SCHOFER: Originally the qualitative factors was going to be due prior to the NTTF recommendation paper and SRM and so we requested that, you know, we get the SRM direction prior to, you know, submitting the qualitative factors paper and we got the two months.

VICE CHAIRMAN RAY: Well it's not clear in the EDO letter where the two months came from, but

you're telling me that was what negotiated.

MR. SCHOFER: Originally it was the other way and then we negotiated so that qualitative factors could at least benefit from the SRM guidance.

VICE CHAIRMAN RAY: Yes, well the upshot of it is is we looked at August 18th we're wondering what we're going to face at that point in time when we talk about BWR venting.

CHAIRMAN STETKAR: Let me clarify something. August 18th isn't necessarily BWR venting.

VICE CHAIRMAN RAY: Well currently scheduled --

CHAIRMAN STETKAR: It is qualitative factors in the context of this second bullet, which is a broader issue.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: Well that may --

CHAIRMAN STETKAR: So we'll discuss that tomorrow during our meeting.

VICE CHAIRMAN RAY: We will discuss that tomorrow. It's shown on the schedule as associated with containment.

CHAIRMAN STETKAR: It's --

MS. BONE: Yes.

MR. SCHOFER: And we do have some --

VICE CHAIRMAN RAY: And specifically the SRM that addresses containment venting.

MR. SCHOFER: We do have some backup slides that address qualitative factors that kind of give you some foreshadowing as to where we're going, so if we can get to that after Alysia's done.

VICE CHAIRMAN RAY: Yes.

MS. BONE: Yes, absolutely.

VICE CHAIRMAN RAY: Okay. Well the reason I'm being adamant about it here is because I'm trying to parse out the SRM that treats the venting issue distinctly and separate and in fact uses the words independent from that when it gets to the other topic.

MS. BONE: Right.

VICE CHAIRMAN RAY: So we got to talk about one or the other, and maybe we can talk about both, I don't know. But the point is --

MS. BONE: I see what you mean.

VICE CHAIRMAN RAY: -- we need to know when we're talking about the one and when we're talking about the other.

MS. BONE: At the upcoming August subcommittee meeting, that is focused on the qualitative factors paper solely.

MR. SCHOFER: That's SECY --

VICE CHAIRMAN RAY: Okay. If you look at our schedule that's not the way it's shown, but that's our problem.

CHAIRMAN STETKAR: I think that's an error in our schedule as we've seen it right now.

MS. BONE: Oh, okay.

VICE CHAIRMAN RAY: Okay, well that's fine.

CHAIRMAN STETKAR: We'll sort that out internally tomorrow, but okay.

VICE CHAIRMAN RAY: Yes.

MS. BONE: I know it's August.

CHAIRMAN STETKAR: You're right, Alysia, August is --

MS. BONE: Okay.

VICE CHAIRMAN RAY: Okay. Well that was the problem that I was struggling with was we were showing it as, in fact it shows it's associated in the meeting list with the SRM on containment venting.

CHAIRMAN STETKAR: Right.

MS. BONE: Oh, I see.

CHAIRMAN STETKAR: I think that's, I believe that's an internal error that we don't need to -- You now have 29 minutes until you have to leave.

MS. BONE: Okay.

VICE CHAIRMAN RAY: Well if it's an error that's at least a big step.

MR. SZABO: Yes. I just have --

MS. BONE: Who's this?

MR. SZABO: It's Aaron Szabo, I'm the PM for the Rulemaking, Filtering Strategies Rulemaking, I believe it's in February, is the ACRS meeting for it.

VICE CHAIRMAN RAY: Okay, well then --

CHAIRMAN STETKAR: That's February of 2015.

MR. SZABO: 2015, yes.

CHAIRMAN STETKAR: Right.

VICE CHAIRMAN RAY: That's forever in the future.

MS. BONE: Yes.

VICE CHAIRMAN RAY: We wound up, as John has now said, making an error and thinking we were going to talk about venting in August.

MS. BONE: Okay.

VICE CHAIRMAN RAY: But that's not the --

MS. BONE: So hopefully that clarifies things a bit.

VICE CHAIRMAN RAY: Okay.

MS. BONE: August will be focused on this

qualitative factors paper.

MR. SCHOFER: Which is a broad, it's a --

MS. BONE: Which is broader, it reaches up, you know, more business lines.

VICE CHAIRMAN RAY: All right, that's fine.

MS. BONE: It's not just focused, it's more sort of holistic in nature, that kind of thing. That will be a notation vote paper and it's currently scheduled to be due to the Commission in July and as we have already noted we'll be coming specifically to you to discuss this topic.

CHAIRMAN STETKAR: And you're on schedule with that?

MS. BONE: We are. We are, barring any unforeseen circumstances we are on schedule.

VICE CHAIRMAN RAY: Okay. So the upshot is that we may then if we feel a need to comment be commenting on something that you've sent to the Commission and, depending on how quickly we do it, before they respond and we just can't be sure of that at this point. Okay.

MS. BONE: The last item is the regulatory gap analysis and this was a specific task from the economic consequence SRM and it was that we needed to

perform the regulatory gap analysis prior to developing any new guidance.

So we are currently engaged in this topic, and I should say that is in exception of the dollar per person-rem and replacement energy cost which we can do right now.

This is due as an information SECY paper due out in November of this year. So I'll just quickly go to the next slide which talks about this more. This is an illustration and sort of our scope and how we're walking through this.

We are looking at the cost-benefit practices across regulatory analysis, backfit analysis, and environmental analyses for all regulated activities, operating reactors, new reactors, these were specifically noted in the SRM itself.

And our process here is we are looking through it identifying any similarities among these various cross-benefit practices and identifying any differences. And where there are differences across either the analysis itself or across the business side, we're examining whether or not these differences are justified.

In some cases these differences, that's why we're sort of not using the word "gap" as often,

because there were, you know, sometimes this differences are quite justified depending the nature of the analysis, the different regulatory requirement, or kind of a purpose or goal of each analysis, or just the inherent differences in the application itself.

Where those differences are justified as we're updating our guidance we'll be sure to write an explanation or explain, clarify why these differences are justified.

In the event that we uncover a difference or a legitimate gap, this could be due to a lack of guidance or something, or representing a policy issue that we need to go to the Commission with to flesh out more, receive their guidance, and then update our cost-benefit guidance accordingly.

So we're still in the process right now internally of discussing all of this. We have a series of internal workshops and discussions to really kind of get to the heart of any differences or similarities.

Not only that, not only just to kind of, you know, to complete the analysis, but also we're using this as a knowledge management and knowledge transfer tool to introduce people to cost-benefit practices in general and hear from folks who've doing

this for awhile.

This is another one that we've noted. I think it's also on the list of items that we would be coming to the ACRS for and discussing further. This, Slide 11, just discusses our overall two-phase update approach.

The last couple of slides we talked about six sort of different items. Here we have this overall two-phased approach. The first phase we're calling administrative changes.

We know that in NUREG/BR-0058, the Guidelines, and the Technical Handbook, 0184, and our Backfitting Guidelines, NUREG-1409 there is some outdated information, some duplicative information. We would like to make these more user-friendly.

We want to kind of consolidate, clean them up, kind of have everything in one, sort of the centralized information that's applicable across different analyses and across business lines in sort of the main part of one document and then have a series of appendices to be able to kind of streamline updates the future, make it easier, you know, instead of updating the entire document, if one attribute needs to be updated we can just sort of work it, you know, sort of piecemeal like that.

So we are, you know, kind of, in hopes that we don't get in a situation again where we haven't updated our guidance in quite a long time. So this all represents, this restructuring, consolidating, and cleaning up represents administrative changes.

We don't see it as a policy issue in things that we could do right now. So right now we are in the process, and parallel to the gap analysis and the qualitative factors paper trying to clean up the guidance, et cetera.

We're hoping to kind of restructure by the middle of next year to then kick off into Phase 2, and this will start, as I mentioned, after the gap analysis and this is our start of addressing any potential policy changes in our guidance or methodology.

As we mentioned any specific items or lessons learned that we get from our gap analysis or from our discussions with members of the public or industry, just in general, as we start to kind of populate our list of anything that needs to be changed we would go to the Commission on a case-by-case, subject-by-subject basis, get their input, and then update it one of those appendices as I had mentioned

before to really try to just, in different avenues, chunk off pieces at a time and really focus on one attribute.

And this, you know, obviously, this is a longer effort, this is a multi-year effort that we are anticipating beginning after our gap analysis.

CHAIRMAN STETKAR: Alysia, and I don't whether Fred's going to address it, but when you talk about potential changes in policy, I know the Commission was issued an SRM on relative importance of considering societal risks, for example, as part of the consequence analysis.

Are you considering as part of this Phase 2 reexamining that and how those issues might be treated or are you retaining kind of the scope of what's currently addressed in the cost-benefit analyses?

MS. BONE: We are not bounding ourselves in our plan to just focus only on what's currently in the guidance.

CHAIRMAN STETKAR: Okay.

MS. BONE: We're also looking at just areas in general that there is no guidance and we know cost-benefit practices could benefit from that.

CHAIRMAN STETKAR: Okay.

MS. BONE: So I hope that answers, we're looking at --

CHAIRMAN STETKAR: Partially.

MS. BONE: Okay.

MEMBER SCHULTZ: Alysia, have you identified a clear definition for what administrative changes would be versus differences that, as you mentioned, could be due to good regulatory decision making?

MS. BONE: Yes.

MEMBER SCHULTZ: Differentiate one methodology from another, one approach from another, or even one assumption from another?

MS. BONE: Well I think maybe the clearest sort of administration changes as I talked about is just, is consolidating the documents looking through and seeing where there's duplicative information and just, and keeping it one centralized location, one space, and making sure we're being better about periodically reviewing.

I'm hoping that is a cleaner, clearer definition of, you know, sort of our editorial changes. We don't have a specific distinction or definition in the paper, but at this point we are, you know, as we identify something that could be more

policy or a change in practice in guidance, I think we have to decide these on a case-by-case basis. I hope it --

MEMBER SCHULTZ: Okay.

MR. BAHADUR: Just to bait on to what Alysia said, and earlier, Mr. Vice Chairman, you had asked a question as to what the BR meant. You will see in the several NUREG's the Agency publishes, there's a NUREG, there's a NUREG/CR, which is mostly the Contractor Report, which the staff is not our opinion, the contractor's is. We published that.

Similarly, NUREG/BR is published when it's a branch position. It does not go to the division review. It does not go to the office and the staff develops something at the branch level and that goes as a NUREG/BR.

So you mentioned the, if you see here NUREG/BR-0058, NUREG/BR-0184, were developed at one time at different branches. NRR does the cost-benefit very differently than NMSS does, or FSME would do.

And this Commission has said well, okay, there is differences where we need to need to know why those differences are there, just find out. So when this gap analysis is started, it is one of the largest working groups that I've ever seen in my organization,

because this has members from every major office and they're coming up with their practices as to what they are doing, why they are doing it.

The idea is not to come up with one guidance, but the idea is to understand what the difference is, where and why those differences are there. So this --

CHAIRMAN STETKAR: And why is the idea not to come up with warning guidance that can be used?

MR. BAHADUR: A couple of reasons, for example, the licensee of the power plant. To them the safety and the cost related to that safety are very different than making only fire signs.

It's a different measure all together and it's those kind of factors that need to be taken into account before you get to the cost benefit. So the idea is not like things that are lesser safe in one area versus in the other.

But the idea is what is the cost versus benefit for one licensee versus the other licensee, and that's the difference that we are trying to understand.

So this NUREG/BR, which was developed for one set of licensee may have different factors than the other one and what the staff is doing is to

collect all that information, clean it up to see where the duplication is, where the difference is, or where the gaps are.

So the gap analysis would show all that information into one place.

VICE CHAIRMAN RAY: It's not clear whether or not the differences include the different source term involved as one might think well that's simply one of the inputs to the analysis, it doesn't result in a different decision criteria. Is it that?

MR. BAHADUR: That would be one of the factors. I mean no one is --

VICE CHAIRMAN RAY: It would be one of the differences?

MR. BAHADUR: I don't think the staff is going to propose not to consider the source terms.

VICE CHAIRMAN RAY: No. I'm making the point of is that one of the differences, she's talking about differences?

MR. SCHOFER: No.

MS. BONE: No. We're --

MR. SCHOFER: NUREG-0588 and NUREG/BR-0814 are used by all of the offices in performing cost-benefit analyses. There are different focuses if you're doing a NEPA analysis versus a REG analysis

versus backfit analysis, you know, backfit analysis has certain requirements by regulation.

NEPA has similar requirements by statute. reg analysis, as you'll find out, we do those voluntarily and I'll give you the background for that.

VICE CHAIRMAN RAY: Okay.

MR. SCHOFER: So there are differences in terms of what the drivers are. The guidance documents do address source terms, you know, for materials versus reactors versus pools versus, you know, so that's not the difference.

VICE CHAIRMAN RAY: Okay.

MR. SCHOFER: But there is more reactor-centric, you know, there's a lot more guidance associated with evaluating reactors than materials and other things, and so, you know, there may be some differences in terms of practice or where there may be omissions in guidance that we're trying to identify.

VICE CHAIRMAN RAY: Okay. So, for example, on a reactor you have to get over the threshold of the significant safety benefit before you even ask the question.

MR. SCHOFER: Yes. For instance the safety goal is only really for reactors and you don't have anything equivalent for materials.

VICE CHAIRMAN RAY: Yes.

MEMBER SCHULTZ: But that's why I wanted to be sure that this cleanup was not going to be just to change everything so it's all the same --

MS. BONE: Oh, no, no, no.

MEMBER SCHULTZ: -- as a regulatory basis that needs to be discussed, determined, and evaluated before any changes are made.

MR. SCHOFER: Correct.

MR. BAHADUR: Absolutely.

MS. BONE: Absolutely.

MEMBER SCHULTZ: Yes, thank you. That's very helpful.

MS. BONE: So just as a quick recap, I think we've talked about most of this. This is just sort of a schematic of what's on the horizon for the rest of 2014.

He have the ACRS meeting today. The qualitative factors paper will be due and going to the Commission, currently middle of July. We have another ACRS meeting scheduled specifically on the qualitative factors in August and then the draft NUREGs, we're hoping tentatively in the Fall timeframe.

The gap analysis due towards the end of November, and then by the end of December, end of 2014

in general, we're hoping to have a good, begin some of these kind of restructuring, cleaning up the documents, et cetera.

Again, with the ultimate goal of finishing the restructuring by the middle of next year to then be able to tackle specific policy issues if we identify any.

CHAIRMAN STETKAR: Okay, just for clarity --

MS. BONE: Yes.

CHAIRMAN STETKAR: -- that August is a subcommittee meeting?

MS. BONE: It is, and the Full Committee is in September.

CHAIRMAN STETKAR: Perhaps Full Committee in September?

MS. BONE: Yes.

CHAIRMAN STETKAR: It makes a difference because the subcommittee does not speak for the ACRS so it's not actually an ACRS meeting as this one is.

MS. BONE: Right, yes. Sorry, I meant to clarify that. Yes, the Full Committee is in September.

CHAIRMAN STETKAR: It's subtle.

MS. BONE: Yes. Oh, I appreciate it.

CHAIRMAN STETKAR: But it does make a difference to the public.

MS. BONE: Absolutely. One last item, this was a specific item under the SRM for this paper in general, was to discuss how updating guidance would influence changes to the Price-Anderson Act.

We have a piece in the paper, a couple paragraphs as well as an enclosure that discusses this more. The next thing on the horizon is that the Commission is required to submit a report to Congress by December of 2021 on its need for continuation for modification to the Price-Anderson Act.

I think the current Price-Anderson Act is extended through 2025, quite a long ways from now, but historically the staff has not used cost-benefit analyses as means to inform the Commission's report to Congress.

As I mentioned we talk about this more in the enclosure, but it's more of information and historical information about it. That is all my slides on the plan and sort of the moving pieces. I appreciate the notes that, I've taken copious notes on items that might of interest and topics of interest in the future.

Are there any other questions or things

that I can answer?

VICE CHAIRMAN RAY: Well the major clarification at this point, for me anyway, has been that the August subcommittee and potential September Full Committee meetings will not deal with the venting, BWR venting issue --

MS. BONE: Right. Right.

VICE CHAIRMAN RAY: -- notwithstanding what we have put in our own scheduling documents.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: But the implication of that, I don't know what the intent was, implication of referencing the BWR thing. I realize it arose in the SRM having to do with BWR venting.

MS. BONE: Yes.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: That's where the --

MS. BONE: Right.

VICE CHAIRMAN RAY: But it said independent of this we want to talk about that.

MS. BONE: Right.

VICE CHAIRMAN RAY: So it was almost like a coincidence or an afterthought, it's the last paragraph in the SRM.

MS. BONE: Right.

VICE CHAIRMAN RAY: So we probably shouldn't attach it to that SRM. It belongs more, in my mind, with the other SRM issue today, before or after that one, which talked about the broad subject that you had been talking about, right?

MS. BONE: Right.

VICE CHAIRMAN RAY: We all together on that? Okay, fine. So any other questions for Alysia before she zooms off?

CHAIRMAN STETKAR: There has to be some way that we can make her very uncomfortable getting to her airplane.

VICE CHAIRMAN RAY: No. No it doesn't.

MS. BONE: I'm not driving, so I'm okay.

MR. BAHADUR: I believe going to BWI at this time is uncomfortable enough.

MS. BONE: Is it?

CHAIRMAN STETKAR: We don't have to do it.

VICE CHAIRMAN RAY: Okay, well thank you very much. Thanks.

MS. BONE: Thank you. Thank you very much for your flexibility. Thanks for the opportunity. Thank you.

VICE CHAIRMAN RAY: And we'll see you in August.

MS. BONE: See you in August.

MR. SCHOFER: All right. My name is Fred Schofer and I'll be discussing Regulatory Analysis Overview. What I'm going to do is give you the background, talk about the content, talk about the current practices and, you know, you can lead me wherever you want with your questions.

I have the definition, you know, it's a recent analysis, you know, really the key thing and it was brought up by one of the members already is it's a societal cost-benefit analysis where we're looking at the broad impacts upon society both from benefit and cost perspective.

Now the regulatory analysis process begins when it becomes apparent that there is some type of action to address and identify a problem. So, typically, that occurs, you know, at the regulatory bases stage, you know, someone identifies a problem and then the regulatory bases is really examining that problem, you know, coming up with what is the true problem, who is affected, you know, what licensees, what are possible paths of solution, you know, what's the regulatory bases, you know, and documenting all of that to determine whether any regulatory action should be pursued.

And during that point in time, you know, we're looking at it from a regulatory analysis perspective to identify, you know, benefits and costs of each of the approaches that is being considered. Not everything goes to rulemaking, it could be some other action.

It could be information notice, it could be a bulletin, it could be a, you know, whatever it is. So, you know, we're there analyzing at that point. With regard to cumulative effects of regulation, one of the recommendations made is that the regulatory analysis should be available early on as part of the regulatory bases stage such that we can be informed by stakeholder input at that point in time, whether pursue regulatory action or not and whether our costs are aligned and that kind of thing.

So we've already done that. That was one of the recommendations and we're already well along with regard to that. Benefit cost-analysis is technically an activity within the regulatory analysis process and benefit cost estimate involves collecting, analyzing historical data, apply models, techniques, tools, and data to predict an alternatives future benefits and costs and, again, from a societal perspective.

VICE CHAIRMAN RAY: Okay. Not today, but when we do talk about this again, the concept of societal is going to be something at least I'll want to talk about because, for example, the cost to a cost to a service licensee that could pass through the cost is one thing.

MR. SCHOFER: Correct.

VICE CHAIRMAN RAY: The cost to a merchant licensee who can't pass through the cost is another thing. So it's all society I suppose, but on the other hand the impact and whether the plant shuts down or doesn't and that kind of thing is, varies from plant to plant and we'll want to explore that a little bit more and not just well, it's a societal benefit, a societal cost.

MR. SCHOFER: Yes, you're more interested in who bears that cost.

VICE CHAIRMAN RAY: No, no, how do we think about it?

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: I'm not interested personally in, I just recognize there's huge differences and, you know, as between like I say a cost to service plant that just says well, my costs have gone up, so ratepayers have to pay more versus a

merchant plant which is my costs have gone up so I'm going to shut down.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: Those are two possible outcomes that occurred today and --

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: -- whether we want to recognize that or not we can talk about it.

MR. SCHOFER: Okay. What I have here is examples of regulatory actions, some of them require regulatory analysis and some do not and really the difference has to be whether the action is imposing additional burden on either a licensee or a society.

So, for instance, those items on the right typically are things where we're, you know, transmitting information and we're not presenting new or revised staff positions or imposing requirements or recommending actions.

Those on the left typically are establishing new requirements or establishing burden where we're asking questions, asking for them to do a submittal or something along those lines.

Items such as regulatory guides are where we're possibly setting a new standard. We're saying this is an appropriate approach for meeting, let's say

a rule, and that in and of itself because it may be a performance-based rule is establishing a standard which we will then use to base our cost estimates on.

Purpose, you can see the purpose, but generally the reg analysis is intended to be an integral part of NRC's decision-making and yes, you know, so you can see that it's provided, you know, for policy makers, the Commission, provides a rationale for action so that the public stakeholders understand how we, you know, got to the decision we got to.

And it's consistent with executive orders on regulatory analysis and related issues and we're complying with OMB, Office of Management and Budget, guidance and orders associated with that.

Particularly OMB's circular A-4 provides guidance to federal agencies on development of regulatory analysis as required under Executive Order 12866 and that's really the major order that is establishing regulatory analysis for executive federal agencies, which we don't fall under, but we are meeting voluntarily.

Let's see, I'm on Slide 19 and here is, you know, a regulatory analysis as I indicated before, you know, establishes communication requirements, guidance requests, that would result in a change in

license of resources.

Any time that we have a backfit we do a regulatory analysis and we do them when we're imposing generic requirements. So, again, it's, you know, a follow up to the prior slide.

VICE CHAIRMAN RAY: Well let me ask you just one question here. You had licensing actions in the column that regulatory analysis is not performed for and you had the two column page before.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: Here you say it's backfitting, but only backfitting which is being pursued pursuant to a generic letter is that what you mean to say?

MR. SCHOFER: Typically we do regulatory analyses for generic actions. If you doing plant-specific backfits then that's, you know, a slightly different process. So for a licensing action, you know, we're not doing a generic analysis on those.

VICE CHAIRMAN RAY: Well, okay. So the point is you could read this bullet here on 19 to say involves backfitting licensed facilities under generic rules or something of that kind.

MR. SCHOFER: Correct.

VICE CHAIRMAN RAY: Not just -- Okay.

MR. SCHOFER: Yes, it's generic backfit.

VICE CHAIRMAN RAY: Okay.

MR. SCHOFER: Okay. Slide 20 shows you that there's no legislation or regulation that requires regulatory analyses for NRC initiated actions.

However, multiple executive orders had been issued on the topic over the past several years and the NRC has been voluntarily performing such analyses since 1976. So, I mean, you know, 40 some years, and voluntarily complying with OMB circular, which is named a regulatory analysis since 1981.

So we've been doing these analyses, originally called value impact analyses, you know, since, you know, '76 so it's a long time. Let's see, okay.

The format and content, you know, the standard format and content is shown here, it's divided into seven sections. The one section is unique to the NRC, and this is similar to what's included in other agencies analyses, but one that is unique to the NRC is the safety goal evaluation and I'll be talking about that specifically.

This is the same just in a figure format, but the statement of the problem is key, it's a

concise summary of the problems or concern that needs to be remedied and, you know, it's a clear understanding of what the problem is, why it exists, the extent of the problem, where it exists, why it requires action, you know, who it's impacted, you know, what licensees, you know maybe only, you know, one type of plant or it may be pools or maybe whatever it is.

But the idea is to have it very specific and focused and then with that problem statement you then identify, you know, possible alternatives that would address those issues.

And so, you know, you certainly want to identify, you know, does it impact a specific class or classes of licensees, you know, reactors, facilities, material licenses, whatever, and any distinctions between impacted licensees should be noted as well, or differences such as facility type, age, design, or anything else.

So like when we did the expedited spent fuel transfer, you know, we did different classes of pools, containment vent, we looked at the different types of BWRs, Mark I, Mark II, so, I mean, fundamentally we're looking at, you know, how can we do classes of either licensees, plants, whatever, to

perform the analysis.

We also are looking at alternatives and those alternatives should be reasonably comprehensive so that all reasonable and practical approaches to the problem are considered. We do do screening on those, you know, anything that is technically impractical, would have implementation difficulties, would have a high cost in relation to the benefits are screened out and then those are, all other reasonable and practical approaches are then evaluated.

And we always consider the no-action alternative and we're really doing an incremental analysis where we're looking at the difference in benefits and costs associated from going from the no-action or the regulatory baseline condition to whatever this new alternative is.

So we're not doing a total cost thing, we're doing an incremental analyses.

MEMBER POWERS: I know that currently within the government some issue of what constitutes something that's technically feasible, like you're aware of the particular issue. How do you guys look at that?

MR. SCHOFER: How do we do if whether it's technically feasible?

MEMBER POWERS: Yes.

MR. SCHOFER: I mean, you know, certainly there is judgement involved. I mean, let's take for instance in most cases the question of technical feasibility will be that there is insufficient data to support the estimation of either cost or benefits.

And either, you know, from that vantage point, would either have to say, you know, either there's not enough information to go forward with the evaluation of that alternative and either, you know, indicate that additional research would be required or, you know, go out and find out if that solution is even available, or, you know, we may, you know, put that aside and say, you know, it's not something we can analyze.

MEMBER POWERS: Well in the particular case I'm thinking of is people have done research, they say things are feasible to do, but the gap between going from a research to practical applications where you have some metal in the field and things like that.

MR. SCHOFER: Yes. You know, I can remember a time, you know, more than several years ago, control room habitability where there was the need to detect a large spectrum of chemical isotopes

within a very short period of time so you could isolate the control room and ensure control room habitability.

And this particular plant was next to a chemical facility, in fact one of the largest in the U.S., and so, you know, they were looking at the, you know, spectrography and how quickly they could evaluate adverse compounds within a short, and I'm talking, you know, seconds type of timeframe.

Whether that, you know, and that really became a research project versus, so was that really a technically feasible get ready for prime time type of alternative? Probably not.

MEMBER POWERS: So it really does boil down to a little bit of judgement on these things.

MR. SCHOFER: Yes.

MEMBER POWERS: And reasonable means you can disagree.

MR. SCHOFER: Yes.

MEMBER SCHULTZ: The complement question is what about treatment of uncertainty?

MR. SCHOFER: And we'll be getting into that a little bit later.

MEMBER SCHULTZ: Okay.

MR. SCHOFER: All right. Steps 3 and 4,

you know PRA is relied upon to quantify risk reduction, especially for, you know, accident-type attributes.

And so, again, you know, we recognize that not all regulatory actions are amenable to quantitative risk assessment and that certain evaluations are based upon engineering judgement or a qualitative analysis.

And so that's another place where, you know, qualitative assessments come in and I know that, you know, you're interest in qualitative factors and, you know, that's a point that that would occur.

MEMBER POWERS: When you look at these things how do you address first of a kind engineering?

MR. SCHOFER: Yes, most of the first of a kind engineering that has come up recently has to do with the new generation of reactors coming forward and, you know, they're doing a lot of testing associated with that as well, you know, prior to, you know, to determine the concept and then doing, having specific plant testing done as part of startup to validate that, you know, for the first, you know, three, six, you know, whatever number of facilities to validate like, for instance, natural circulation and those types of things.

Typically, you know, we don't get into that so much with reg analysis and that's, you know, more toward, you know, initial licensing actions, but if that does come forward, you know, we would have to be specifying something very similar to that.

You know, test programs, to validate concept as part of the alternative solution.

MEMBER POWERS: Yes, wait a minute. One of the things that I have read in the past, too --

MR. SCHOFER: And maybe, you know, that Rulemaking 46(c) where we're looking at fuel fragmentation, you know, gets into that a little bit where we're looking at testing associated with that.

MEMBER POWERS: But one of the studies of this nature that have made a huge impact on me, it's getting very geriatric, you know, where they ran studies and first of a kind engineering, where they define first of a kind engineering, it's the first time you did it not that it had been done in the world.

MR. SCHOFER: Yes.

MEMBER POWERS: And costs ran twice, estimates and performance ran 80 percent of expectations when you're doing something for the first time.

MR. SCHOFER: Yes. And if you're doing that, if you're imposing that generically across a fleet of licensees, you know, that may not be a cost beneficial type of solution given, you know, that if you're doing a research and you don't know what the answer is to get what benefit, you know, typically, you know, the cost would very much outweigh the benefits and you might want to look at a different type of solution.

So as I say, typically we don't get into first of kind because of the cost and the unknowns.

MEMBER POWERS: Oh, okay. Now I understand what you mean. You don't get into it, you try to avoid it.

MR. SCHOFER: Yes.

MEMBER POWERS: My own judgement.

MR. SCHOFER: Estimation evaluation benefits and costs is the bulk of the regulatory analysis as you might imagine, but let me go back to Step 3 and talk a little bit about safety goal evaluation.

I'm just going to go to another slide to kind of highlight what I want to talk about. Yes, as you know, yes, the Commission's 1986 Safety Goal Policy provides a safety first test that gives added

strength to the regulatory decision-making process for new nuclear power reactor requirements, so they were considered and justified safety enhancements.

And it really sets, you know, a standard in terms of, you know, how safe is safe enough and it's a philosophy that we use, you know, early on in the regulatory analyses to determine, you know the likelihood that the alternatives would pass the safety goal.

Because typically if we're doing a regulatory analyses it's also supporting backfitting, you know, because it's going to be imposing new requirements on existing licensees.

And so we do this very early on to understand where we are with respect to that standard because it may very well be that if you can't pass that threshold you'll do a lot of work and then you'll find out here is the cost, here is the benefits, you don't pass the standard and, you know, whether the benefits are sufficiently strong enough against the cost to go forward, you know.

That's a question for maybe imposing on new licensees, but you may not be able to do it for existing licensees, so it's something that we do early on.

The safety goal, as I indicated before, involves nuclear power plants and, you know, the fuel cycle and impacts of sabotage or diversion of nuclear material not included in the safety goal, so they're handled, you know, more qualitatively.

As you can see I'm bringing in the qualitative piece because it's, I just want to foreshadow some things that you'll be talking, or hearing about in the future.

And the safety goal screening criteria, this is actually out of our regulatory analysis guidelines, that's in NUREG/BR-0058, and what it does is it pretty much, you know, sets up a little decision matrix with regard to, you know, where you are with respect to the safety goal screen and, you know, whether you should proceed or not.

And you can see that, you know, if it's greater than ten to the minus four, you know, per reactor year you should proceed on a high priority basis and if it's less than ten to the minus five you might terminate this analysis unless, you know, there are other factors involved and it could be, you know, you're getting direction from, you know, office director or whatever with regard -- And so recently, you know, some of the Fukushima items are certainly in

the less than ten to the minus five range, but they have relatively large impacts.

And so we went forward and did, you know, a full reg analyses associated with that to evaluate, you know, what is the, you know, the answer that comes out of the reg analysis in terms of is it cost beneficial, you know, what's the uncertainties, what's the impact of the qualitative factors, and then we make recommendations.

And so you saw that with the spent fuel pool, or spent fuel transfer, you also saw it with the containment vent, and those are two which definitely were at less than one times ten to the minus five.

MEMBER RICCARDELLA: Excuse me. You didn't label the vertical axis. I assume that core damage, right?

MR. SCHOFER: Yes, it is.

CHAIRMAN STETKAR: Fred, how do you handle, you know, you used the term, people use the term PRA very glibly as if the thing that you call a PRA is the same as the thing I call a PRA and how do you handle a fact that most of the things that people tend to call a PRA are very far from a full scope PRA that considers all modes of operation and all hazards so that the safety goals actually are cast in terms of

all modes of operations and all hazards --

MR. SCHOFER: That's correct.

CHAIRMAN STETKAR: -- not internal events only during full power operation so that the number that you calculate from something that's a very small snapshot of the actually total risk, how do you handle that when you do your screening analyses?

MR. SCHOFER: In the past it was believed that the internal were the dominant contributors and result in the max and the other were more a minimus.

CHAIRMAN STETKAR: Okay. For the record, people doing PRA have known for about 30 years that that's not the case for the vast majority of modern plants anyway, that the risk is dominated by things like fires and external hazards.

So how do you, you know, for 30 years, how do you resolve that knowledge? Thirty years.

MR. SCHOFER: Yes. Well we're given the PRA results that we use, so if there are limitations upon that then we need to address that in our analyses.

CHAIRMAN STETKAR: Well how do you do that in practice?

MR. SCHOFER: In practice, it depends what is provided. If, for instance, the more recent things

are being driven by external hazards so we would only take into account, you know, the seismic issues, the flooding, the extended loss of offsite power.

CHAIRMAN STETKAR: Have you considered things like events that occur during shutdown when the containment is open and you have no containment? This is in practice --

MR. SCHOFER: Right.

CHAIRMAN STETKAR: -- because you're actually using, and if you think about, you know, going forward with this guidance, these are real things that people know about, that in many cases, you know, the thing that you can measure most easily might be a small fraction of your actual risk to the public.

MR. SCHOFER: The, I mean, fundamentally, if we know it we can do sensitivities around the core damage frequency to understand, you know, at what point would something become cost beneficial so we can do, you now, we can very, if we're given a core damage frequency and we use that we can do sensitivities around that to determine how sensitive we are to that particular input, and, typically, we would do at least that.

CHAIRMAN STETKAR: I think what I'm asking is when you say "when we're given," it's not clear to

me who "we" is. I think of "we" as the Agency, so when the Agency evaluates information about risk, and if you're calling it core damage frequency and some call it risk, how does the Agency evaluate the fidelity of that information and how it's used as part of this analysis?

MR. SCHOFER: Well the Agency, you know, as part of the problem statement and the development of that frequency were developing it for this purpose. So if there are limitations or, you know, items that need to be considered more qualitatively because there is large uncertainties associated with that number then we would typically do sensitivities around, for that parameter.

CHAIRMAN STETKAR: Okay.

VICE CHAIRMAN RAY: We had a little discussion awhile ago about the fact we're just talking about generic applications here.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: And yet in talking about it as we just did, external events, there's such diversity in those that, take Central and Eastern U.S. seismic versus Western U.S. seismic, for example.

I know you can't answer that now, but, you know, it's something we think about is are we just

painting everything with such, maybe at least one, maybe two orders of magnitude differences because of their location, flooding would be similar, perhaps, as if they're all the same and if we're doing that, you know, are we just sticking our head in the sand.

Anyway, I'm not expecting you to be able to answer that, but I mean, I'm just letting you know that those are the kind of things that we would pause on in a full review of this.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: There's not much point in doing here and now, but I'd rather at least tell you that that's on our mind.

MR. SCHOFER: If there are those types of, you know, outliers and, for instance, the spent fuel transfer, you know, identified that as well, you know, we looked at Central and Eastern U.S. pools recognizing that the Western U.S. had different seismicity and needed to be done as a separate analysis.

But if there are those types of outliers, you know, whether it be flooding because of dam failure or seismicity because of, you know, location with respect to very high seismic zones, you know, those should be done not possibly as a generic but

more as a plant-specific.

VICE CHAIRMAN RAY: Yes, but then that ought to still retain the idea of cost-benefit you would think.

MR. SCHOFER: Oh, yes.

MEMBER SCHULTZ: But it is issue-specific, sometimes the issue that you're exploring can be informed by, the evaluation process can be informed and the quality or the extent of the PRA that is taken into account, PRA factors that are taken account may be issue-specific.

MR. SCHOFER: Correct.

MEMBER SCHULTZ: And you're going to the spent fuel pools evaluation as an example of that.

MR. SCHOFER: Yes. But, again, this is just screening rule of thumb, I mean recognizing that --

CHAIRMAN STETKAR: Right, but it's important because in order to get into any consideration of cost and benefits you need to pass this screen, or fail this screen, depending on your perspective.

MR. SCHOFER: Yes.

CHAIRMAN STETKAR: Fred, the screen is really important.

MR. SCHOFER: Well, but the screen is to identify whether to go forward with applying resources to further evaluate the issue. So it's fundamentally trying to determine is this a significant issue, is this something that we should be applying resources for.

As you've seen we've gone, you know, we've done the screen but we continue in a lot of cases, depending upon, because we think it's important.

MEMBER SKILLMAN: Fred, what I find intriguing is your Slide 20, and we can stay right here you don't have to go back there, but this is where you communicated that there's no statute regulation on executive work, this has been voluntary for 38 years.

MR. SCHOFER: Correct.

MEMBER SKILLMAN: And it just strikes me as such an important piece of this business and industry that we're involved in. If I can ask you it this way, how have you been permitted to do all of this voluntarily when the Agency is funded by statutes and regulations and formal guidance?

MR. SCHOFER: Yes.

MEMBER SKILLMAN: It's almost as if you've found a hole in the wall and you've appropriately done

what needs to be done but it's off the radar screen.

MR. SCHOFER: I would say that it's becoming more on the radar screen. You know, certainly Congress is looking at independent agencies and applying and looking at whether a statute should be applied to independent agencies as well as special agencies, or executive agencies.

MEMBER SKILLMAN: That's where I was going is the fact that it's been 38 years voluntary.

MR. SCHOFER: Yes.

MEMBER SKILLMAN: Establishing a notion that it's high time we actually write this into a statute so this is done with the appropriate formality and rigor so that we get a product that we can count on.

MR. SCHOFER: Well the one thing is that as every executive order comes out we review it against our guidance to see whether we need to do anything different to, in essence, conform with that guidance.

So when we say we're voluntary compliant we're fundamentally doing everything that is encompassed by the executive orders and the OMB Guidance and OIRA, you know, primer and reg analysis that has been published.

MEMBER POWERS: Well the pressure --

MR. SCHOFER: Is just that we're not required by statute to do it.

MEMBER POWERS: The pressure for the first ten years goes in the opposite direction –

(Simultaneous speaking)

Well that's right. I mean what happened was the original backfit rule was technical advances kind of, and the significant technical advances you incorporated and people said well, that's not what we want.

And then they went to a cost-benefit type backfit rule and the Court vacated that because of the language in the Atomic Energy Act that said that you cannot, that you had to reassure adequate protection, not adequate protection that doesn't cost too much.

So the pressure was not to do this and the accommodation the Agency has reached is that for adequate protection they don't consider cost we still do the regulatory analysis but they're not considered in the decision-making and if you meet, if you're going beyond adequate protection then you consider cost.

MEMBER SKILLMAN: Okay, thank you, Fred, all right, and Dana, thank you.

MR. SCHOFER: Okay. I'm on Slide 25. These are the attributes that are considered in regulatory analyses and, you know, the attempt is to have a broad enough coverage to account for, you know, total monetary effects, including direct and indirect effects that could affect the economy.

Those that are, you know, parenthetical accidents are, you know, frequency weighted based upon PRA input and you can see that, you know, we're looking, you know, public health, occupational health, offsite and onsite property.

The difference between that is that which is controlled by the licensee and that which is not. Industry implementation, that is looking at the class of plants or the class of licensees that are being impacted, both from implementation which is a one-time cost that may occur over the first, you know, several years after the effective date of the regulation as well as recurring costs which is industry operation.

You have NRC implementation and operation cost which is very similar, that which is required to put the regulation or the regulatory action in place as well as any recurring expenses that are borne by the NRC.

Other government, that could be, you know,

States if it was material licensees where they're governing things, or FEMA, or whomever. General population, you know, any impacts upon that. Improvements and knowledge, regulatory efficiency, are typically more a qualitative-type attributes where we're looking at, you know, whether, you know, a particular action results in more knowledge for either the licensee or the NRC.

Regulatory efficiency may be changes that are imposed that would result in less burden or a more streamlined approach. Antitrust considerations, safeguard and security, environmental, other considerations is a catchall to address anything else.

MEMBER SKILLMAN: On that slide, I kind of pondered whether I should have asked this question to Alysia or you, but whether it's in cost-benefit or reg analysis, how does one assign property value?

MR. SCHOFER: Property value is typically done, you know, if you're looking, what we typically do that as part of MACCS and we're looking at the property value with respect to the GDP associated with the sectors being modeled as, if you recall, you know, MAX devised it into, you know, sectors and we're modeling it based upon, you know, the gross domestic product which is available through various government

databases.

There are issues associated with that, you know. Certainly, you know, let's say you have historical landmarks within that area, you know, how do you assign an economic value above that for the land for those priceless type of considerations.

So I mean there are issues associated with that, but that's how it's done.

MEMBER SKILLMAN: I was --

VICE CHAIRMAN RAY: I don't want to, we're at a point here where we're going to violate our four minutes per slide that we need to get done. We're going to repeat all of this at a subcommittee meeting and so I'd prefer if we'd just tell them things that we want to hear more about later rather than trying to run to ground questions we might have right now.

So with that admonition we're okay as long as we can keep moving.

MR. SCHOFER: Okay.

MEMBER SKILLMAN: For property value tell me the difference in the future about West Chester County versus around Wolf Creek?

MR. SCHOFER: Okay.

VICE CHAIRMAN RAY: Well a better example is Palo Verde versus San Onofre, but go ahead.

MEMBER SKILLMAN: There you go, okay.

MR. SCHOFER: Yes.

MEMBER SKILLMAN: Okay, same difference. That's what I'm thinking of.

(Simultaneous speaking)

MR. SCHOFER: And to the extent applicable, you know, attributes are assessed to, you know, consider both costs estimates and benefit estimates.

VICE CHAIRMAN RAY: You know which one I would've bought.

MR. SCHOFER: And as you may be, you know, we use a lot of different estimation methods, you know we might use analogy, which is looking at costs of similar programs to estimate the cost of a new program or a new alternative.

For instance, in the containment filtering paper we looked at the cost that the Europeans spent to install, you know, filters on their facilities and then looked at their size and, you know, the reactor power levels and what would change associated with our design to, you know, come up with, you know, cost numbers that would be appropriate.

We also use engineering buildup method to, you know, take it into individual pieces and then

estimate those pieces and develop the programs that way. We might do it based upon parametric method, which is running cost to on a more technical performance or cost parameters using statistical relationships.

But the key is we'll use anything that we can based upon the data that we're able to collect. And really data is the foundation of our analyses, you know, knowing those things that influence alternatives costs or benefits help to capture the right data.

And so, you know, we fundamentally kind of have to develop the plan in terms of, determine what data we need to collect, try to get the most recent data that's available, make sure it's reliable, that it's traceable to a source, and then we need to normalize it for the intended application, put in constant dollars, make sure that the size quantity is appropriate for our use, make sure it's in the like units, so we do all those types of things.

And I know that when I've talked to you in the past, you know, I've talked a lot about constant dollars and that's really, you know, changing things so that we have constant purchase power in terms of dollar value and we tie it to a base year.

So then let's say it costs, you know, like

$10 million to implement a particular change, you know, four years ago, so we would look at, you know, our new base year may be, you know, set by when we expect this new regulation to be put into effect.

And so that might be two, four years, hence from now, and so our new base year would be maybe 2018, 2020, whatever it is.

VICE CHAIRMAN RAY: Fred, most of the discussion here seems going to how things are done. I think at this point we're really trying to understand how the plan, the two-phased plan is going to impact all of this not, and so if you could try and focus on that I think it would help us more to understand not so much how do we do things, but how is going to be affected by carrying out this plan the January letter said we would be engaged in.

MR. SCHOFER: Okay. A lot of this will not be directly impacted by the plan. You know, fundamentally, you know, reg analysis we attempt to quantify as much as we can and that also includes, you know, averted dose where we talked about dollar per person-rem.

Most of the plan is looking at, you know, whether there are policy issues or whether there are major changes to how we, use for inputs. You know,

for instance, the replacement energy cost is part of the onsite property because, you know, that is something that has a big impact if you have a reactor accident you're going to lose the loss of generation in that facility.

And, you know, we look at the, you know, different methods for, you know, calculating that replacement energy cost that are borne by the public. With the dollar per person-rem, you know, that's how we monetize averted dose, public dose, as well as occupational dose.

And, you know, so there will be policy issues associated with that. With, you know, you brought up the --

VICE CHAIRMAN RAY: The policies you say, what's the policies you're referring to? I mean I know that I can dream some up, too, but the point is we're engaged in a process here that's going to affect how we've been doing things.

What could you imagine, what would be an example of how this plan that we're going to carry out would confront a policy issue in any of the areas you're talking about here?

I mean I realize updating costs and that sort of thing is one that you need to do, but is there

anything else? I mean there's a gap analysis called for, for example.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: And we're going to I guess look at that before the end of the year.

MR. SCHOFER: Correct. And, you know, a lot of that is the level of detail that is used for estimation and the methods used whether, you know, what are the sources, the traceability, the level of detail, you know, how accurate are those, how reliable they are. I mean, you know, we've got input --

VICE CHAIRMAN RAY: Are we going to answer those questions as part of this plan, the questions you just --

MR. SCHOFER: That's the intent. I mean we got input from, you know, industry associated with, you know, doing an ex post review of certain regulations that were evaluated, such as a power security rule, the fire protection PRA, which is NFPA-805, and what was the reg analysis estimated cost, and what were the actual costs borne by the industry.

And in some cases, you know, there was a factor of two to fifteen difference between what was projected and what was actually spent.

VICE CHAIRMAN RAY: Okay, so one of the

things we'll accomplish in this plan is hopefully to do a better job of estimating costs?

MR. SCHOFER: And benefits.

VICE CHAIRMAN RAY: Fine, okay. All right.

MR. SCHOFER: And that's a big piece of regulatory analyses because you got to have that, you know, that level of certainty if you're doing, making decisions based upon whether it's cost beneficial or not.

VICE CHAIRMAN RAY: Yes, understood. Okay, so we're going to work at trying to improve that outcome in all the areas that are germane. So with that said now what more can we say? We're going to talk about this as they say in August I assume in more detail.

MR. SCHOFER: Well we're going to talk about qualitative factors and treatment of qualitative factors in terms of how it should be considered in the reg analysis and the decision rationale and its impact upon the quantitative analysis.

VICE CHAIRMAN RAY: Okay. And we'll by that time have --

MR. SCHOFER: So that's just a piece. I mean --

VICE CHAIRMAN RAY: By that time we'll have the paper that's going up to the Commission to look at?

MR. SCHOFER: Correct, yes.

VICE CHAIRMAN RAY: All right. And that's going to be on qualitative factors?

MR. SCHOFER: On qualitative factors.

VICE CHAIRMAN RAY: Okay. Please proceed.

MEMBER SCHULTZ: But here on this --

VICE CHAIRMAN RAY: Go ahead.

MEMBER SCHULTZ: Here on this chart, Fred, you know, what I heard before is that what is going to be done in the evaluation for the matrix, the gap analysis, is that each of these bullets and perhaps more will be identified as being the same or different across that matrix, either contained or not contained.

And then each of the bullets would have to be analyzed also to determine the level of detail that would be attributed to one particular application versus another, or, you know, along the two axis's that are being investigated.

MR. SCHOFER: Yes, what we're doing is we're looking at how, you know, these costs and benefits are evaluated in practice and the differences in terms of the various uses as well as the offices,

how they do it. That is correct.

MEMBER SCHULTZ: Okay.

MR. SCHOFER: And, for instance, I mean, you know, cost to travel governments, typically that is not explicitly reported and so would want, you know, additional guidance and focus with regard to reporting that particular attribute as well as how to, let's say, value, you know, tribal land if it's being either condemned or impacted somehow based upon, you know, an alternative that we're evaluating.

MEMBER SCHULTZ: Thank you.

MR. SCHOFER: Okay. This next slide we're really talking about the, you know, level of effort required for a regulatory analysis and what I show on the left are, you know, items that result in major effort drivers.

So if it's a major effort you do a lot more, you know, for high profile regular actions you go well beyond the minimum requirements to perform the evaluation, do more work with regard to modeling, and, you know, sensitivities, uncertainties, and so forth.

You know, typically reg analysis may be like a one to two man month effort. On a more major activity it's a lot more than that, but you can kind of see what may be driving that.

The considerations, you know, general principles to be followed include, you know, categories affected groups that should be identified, which include general public, Indian Tribes, licensees, et cetera.

We use best estimates to account for differences in the likelihood and effectiveness of each alternative to solve the problem and these are in terms of mean or expected values.

The established realistic ranges, in performing sensitivity uncertainty analyses, and these may be low, you know, and for the highs they may be, you know, high or bounding analyses.

And, you know, these expected values are, you know, expressions of uncertainties and represent those upper and lower bounds and studies data methodologies that support or fail to support the value of impacts must, to the extent practical, be reported in the analysis.

And so, you know, in cases we identify, as I indicated, the hypothetical best and worst case values as part of sensitivity so that we can understand how, you know, that parametric sensitivity may impact the analysis.

We also talk about discount rate, and I

know in prior discussions, you know, the interest rate used to discount or calculate future costs are, you know, to arrive at their present values, and this is also known as opportunity cost of capital investment.

Because the computation begins with constant dollars inflation is already removed from the equation and typically we use three percent and seven percent real discount rates.

VICE CHAIRMAN RAY: Okay, well again, Fred, I think we know all of that. The only issue is what's on the table here for us to consider now?

MR. SCHOFER: Well discount rates is always, you know, something that is discussed in terms of whether these are the appropriate rates that should be used.

We have, you know, the ability to do other sensitivities other than three and seven, which we have done, but that continues to be an issue not only within the NRC, but within other federal agencies. So as I said, I mean, fundamentally what I'm talking about is current practices.

We have identified, you know, specific areas where we're looking at either updating our guidance with regard to input, you know, or variables that we will use for performing our analysis, but the

fundamental framework for reg analysis is unchanged.

VICE CHAIRMAN RAY: Okay. Well that's a clear enough statement.

MR. SCHOFER: This just gives, you know, an example of if you were estimating costs associated with a plant mod, you know, the types of things that you might consider and you may do, you know, sensitivities associated with the cost, associated with any one of those boxes that would be driving, you know, the total cost for the plant modification.

And that is only just one attribute that is being evaluated as part of, you know, a regulatory analysis. Total cost for a plant mod may fall under industry implementation, so it's only a small piece of everything that we're looking at.

The next slide, which is Slide 30, is looking at NRC guidance on uncertainty and, you know --

VICE CHAIRMAN RAY: Fred, let me interrupt you here. I was groping through this, but looking at the clock I want to ask this question now. Why do you think the Commission said the staff should seek detailed Commission guidance regarding the use of qualitative factors in a future notation voting paper, why did that they do that the best you know?

MR. SCHOFER: Well if you look at the votes the concern was the misuse of qualitative factors, the staff could justify anything is one of the issues that was identified by industry as well as at least one Commissioner.

VICE CHAIRMAN RAY: Okay.

MR. SCHOFER: And the idea is, you know, regulatory analyses are supposed to be impartial, supposed to be unbiased, and supposed to represent the, you know, the best judgement of the staff. Part of that is --

VICE CHAIRMAN RAY: The qualitative -- How would it just --

MR. SCHOFER: Part of that is the repeatability of an analysis. So the question is for the containment vent or the SECY-12-0157, which resulted in, in this particular action the Commission is asking us whether the practice has fundamentally changed, or since we've been considering qualitative factors for almost 40 years, you know, is this, you know, what has changed or are we changing our approach to qualitative factors.

VICE CHAIRMAN RAY: An example being, of a factor where you could make the outcome anyway you wanted it?

MR. SCHOFER: Well for instance if you looked at the reg analysis for 12-0157, you know, the primary drivers for resulting in a large consideration of qualitative factors had to do with defense in depth and the uncertainty associated with the likelihood of the event.

Huge uncertainties associated with a defense in depth is one where if you kind of think of max-min theory and you think about what is the, you know, the maximum consequence that could occur on this particular thing it is, you know, a very large impact to the environment.

If you applied a filter that would ensure, you know, the retention of those isotopes and it would give you a lesser consequence. So from a defense in depth perspective if you wait, if you, you know, how you considered that in relationship to the quantitative analysis is something that, although we identified explicitly what those qualitative factors were we probably did not do as good a job in terms of detailing how that consideration would impact the cost beneficial determination and how we reached the conclusion that we reached.

And so I think the Commission is asking the staff in terms of is the framework as it is

appropriate, has something changed, and, you know, how should the staff consider these qualitative factors going forward.

MEMBER POWERS: The fundamental issue is the defense in depth is a qualitative consideration can trump everything because you can't quantify it and, so anything can be justified based on defense in depth arguments.

VICE CHAIRMAN RAY: Based on the need for defense in depth.

MEMBER POWERS: That's right, yes.

VICE CHAIRMAN RAY: Well, okay, we're at 5:15 so let me let you finish up, but I, again, I'm more interested in us being sensitized to the issues that are in play now than just reviewing how we've done this so far because I think we've got to be discussing among ourselves what kinds of challenges we're going to have to face in terms of our input and I don't think we're here to critique the process that's been implemented up until now, but the issue is what is it that's going to change that will be of concern to us.

MR. SCHOFER: Yes. Certainly uncertainty will probably be a subject of increased focus to ensure that as we do parametric sensitivities that we

don't, you know, simply, you know, create a case where we're looking at, you know, the worst of the worst of the worst, but that we address that more, you know, with an uncertainty analysis using a Monte Carlo approach and using parametric uncertainties to kind of understand what the overall effect is.

So I think there will be, you know, certainly additional focus on uncertainty and regulatory analysis that --

(Simultaneous speaking)

VICE CHAIRMAN RAY: That would address the qualitative factors. You know --

MR. SCHOFER: It partially addresses.

VICE CHAIRMAN RAY: Okay.

MEMBER POWERS: The use of Monte Carlo for these kinds of financial analyses is really quite interesting because we have a prejudice throughout our Monte Carlo analysis of using relatively narrow distributions.

But the financial community finds these heavy tail distributions much more appropriate and, you know, I don't think it's so easy to do a Monte Carlo analysis because a levy distribution might be entirely appropriate for this sort of thing that very heavy tails know, they're an undefined variance.

VICE CHAIRMAN RAY: Another input for you. Let me let you continue to finish up, but we'll come back to that.

MR. BAHADUR: I think at this time it would be advisable for us to summarize and to process. Well I understand the interest is more in the future projects that they already highlighted for you as far as the ACRS was more interested and we'll be seeking your letters in due course. This --

VICE CHAIRMAN RAY: Yes, we're trying to look ahead and be prepared so we can be responsive to you.

MR. BAHADUR: Right. So we already highlighted those for you and if you can just summarize quickly about the process then we'll go from there.

MR. SCHOFER: Yes. Actually I think I only need, you know, to talk about two more slides to kind of get that point across. The next slide is 31 and it really looks at uncertainty analysis for sensitivities.

You know, to date we've done a lot in the sensitivity space, you know, changing one parameter at a time to understand, you know, the importance of that parameter to the overall and, you know, for the more

complex we'll probably move more toward doing uncertainty analysis to address, you know, predictions with regard to that.

Presentation results, decision rationale, fundamentally this was going to be more focused in talking about results, especially those things that are unquantified or not monetized which are fundamentally these qualitative factors to understand, you know, what they are and, you know, how significant they are.

And then in decision rationale to, you know, to address, you know, again their importance and how it would impact your decision rationale with regard to the alternative with the greatest net benefit value.

And probably the only other thing I wanted to hit was just to make sure that you understood the differences between a reg analysis and backfit analysis.

They're really two separate things and what I tried to do on Slide 36 is to identify the differences in that, you know, backfitting is an NRC unique policy, we have a regulation on it, 5109, it was voluntarily, you know, adopted by the NRC versus regulatory analysis which is, you know, a policy.

And backfitting is really protecting the licensees and other entities from unnecessary changes while regulatory analysis, you know, is looking at society, so one is for the benefit of the licensees, the other is for society in general.

The criteria is different between the two. Backfitting, you have to have that substantial increase which outweighs the cost. Regulatory analysis is you're only looking at whether the benefit is equal to or greater than the cost. So, I mean, they're fundamentally two different things.

The other thing is only health and safety or common defense and security benefits are, you know, cost and benefits are considered. Regulatory analysis, we're looking at all benefits and all costs. So even what is, you know, included in the decision process is different. So I just wanted to --

VICE CHAIRMAN RAY: Well do you expect that to remain the case?

MR. SCHOFER: I do. Breakthrough analysis will include all benefits all the time, all society, unless we go into rulemaking and change the backfitting in 109 and in the other, you know, REG 72 or 76 that include a backfit provision, I don't see that changing.

VICE CHAIRMAN RAY: Well the way you calculate the cost in the next to the last line there I suppose could, because you say they're very different, substantiated increase which outweighs the cost of backfitting.

On the one hand backfit equal to a greater than a cost of regulatory action.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: On the other hand one could reconcile those two things, cost appears in both statements.

MR. SCHOFER: They do.

VICE CHAIRMAN RAY: And substantial increase in safety and benefits one could find a way to make those appear to be --

MR. SCHOFER: But one of the major differences when we did the offsite, or the economic consequences paper, and we looked at offsite property damage, which was one of the attributes that we considered. Offsite property damage is not a consideration in backfitting.

VICE CHAIRMAN RAY: Okay. It hasn't been and you don't expect it will be?

MR. SCHOFER: We just recently got that reaffirmation.

VICE CHAIRMAN RAY: Okay, and that's one of the points, you know, I was looking for in the beginning was that's how, at least in my opinion, but that the decision on Recommendation I affects what one might have thought would happen if you just read the January letter and take it at face value.

Okay, you still have five minutes, so, please go ahead with anything else you have to say.

MR. SCHOFER: Actually I'm pretty much done. You know, I had some basic definitions, I have a chart that I've shown you before, which, you know, fundamentally shows some of the differences between backfit and regulatory analysis.

I also have, if you, you know, starting on 41 there are some slides in here associated with qualitative factors and what I just want to point out is, you know, we've been doing this for, you know, 38 years as was indicated before and it's consistent across, you know, the NRC, across all federal agencies, and even the international community.

When they're evaluating, you know, or doing a regulatory analysis they're evaluating both quantitative as well as non-quantified, you know, factors. They believe it's important. We believe it's important.

So, you know, the use of qualitative factors and risk-informed decisions, I don't expect, this is me, that changing because there is --

VICE CHAIRMAN RAY: Well we'll know better how it's done I suppose after all this gets put to bed.

MR. SCHOFER: And, you know, we have some cases here where we talk about, you know, how qualitative factors can be considered in a regulatory analysis, you know, where, you know, benefits are difficult to quantify and you'll see that a lot in materials or safeguards-type actions where it's difficult to identify the frequency of a safeguard, let's say, initiator or, you know, talking about the materials, but costs are quantified.

So you have that case all the time. You have cases where, you know, some benefits are quantified, but not all, but costs are quantified. And so, you know, how does your decision process change when you evaluate that case.

Likewise, we have, you know, quantitative analysis results are not cost beneficial but maybe you have some very significant qualitative factors that, you know, may have some bearing on the staff's recommendation, and that's similar to the 12-0157, how

you would consider that scenario, or be simply, you know, identify the relevant qualitative factors, but you don't consider them the staff's recommendation.

So, I mean, or are we saying that qualitative factors are the most important thing and really trump, you know, quantitative because of uncertainties or modeling uncertainty or whatever.

VICE CHAIRMAN RAY: Well as you respond to the Commission I'm sure you'll be, or someone will be thinking about how this is communicated, understood by people outside the Agency and, just from my experience, they tend to not be very accepting of qualitative and tend to want to see, and put emphasis on, quantitative results because they think that justifies more action I guess would be the way to put it.

So my judgement is you're going to have to have a defense of the use of qualitative factors that is persuasive.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: Not to us, but to the world outside because that's the consumer of these analyses in part.

MR. SCHOFER: Yes.

VICE CHAIRMAN RAY: So we'll look forward

to the July letter and we'll look at it closely. How close is it to being done?

MR. SCHOFER: It's in our interoffice concurrence at this point.

VICE CHAIRMAN RAY: Okay. So it should make the deadline then. One last thing that I have and I'll then want to make sure my colleagues get their questions answered.

On the schedule that Alysia showed the August meeting, which the Chairman correctly pointed out should be shown as a subcommittee meeting, it's shown as "tentative." We're going to be talking more about our calendar and schedule, do you have any reason why it's tentative?

MR. SCHOFER: The reason, we were discussing when we would be meeting with the ACRS to talk about qualitative factors. There was a possibility that this meeting would be that discussion and then a July meeting would be the next time and it was eventually, I guess, you know, earmarked that it would be August/September, and at the time we made the slides we didn't have that --

(Simultaneous speaking)

VICE CHAIRMAN RAY: Okay, fine. So it's not a reflection of you thinking you wouldn't be ready

maybe in August?

MR. SCHOFER: Oh, no, no. No, it's getting on your calendar.

MR. BAHADUR: No, not at all.

VICE CHAIRMAN RAY: Okay, that's all I wanted. Okay, Members, other questions? We still have a little time on the clock here.

MR. SCHOFER: Just enough time to make me sweat.

MEMBER POWERS: All right. This is all very interesting.

VICE CHAIRMAN RAY: Huh? Yes, I will thank you for reminding me. Okay, now, Mike, the line has been open, I mean the line has been in service so we should open it and go through this regular inquiry as to whether there are any comments.

PARTICIPANT: Okay, it's open.

VICE CHAIRMAN RAY: Thank you. Could someone on the line, if there is someone, just acknowledge that you can, you've been able to hear us and that we can hear you? Anyone, just speak up, please.

PARTICIPANT: The line is working.

VICE CHAIRMAN RAY: Okay, thank you very much. Do you or anyone else have any comments you'd

like to make?

PARTICIPANT: I don't.

VICE CHAIRMAN RAY: Thank you very much. Hearing none we'll consider then that this session is done and we can close the line and I'll turn it back over to the Chairman.

CHAIRMAN STETKAR: Make sure there's nobody in the room that want to make any comments.

VICE CHAIRMAN RAY: Oh, yes.

CHAIRMAN STETKAR: Thanks for cramming an awful lot into, a little bit of a rush, I'm sure we'll hear a lot more about this, at least the qualitative factors part of it, this issue in August. With that we are adjourned for today for the record.

(Whereupon, the above-entitled matter went off the record at 5:30 p.m.)

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Protecting People and the Environment

RG 3.75, "Corrective Action Programs for Fuel Cycle Facilities"

Presentation to the Advisory Committee on Reactor Safeguards

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Background

- SRM-SECY-10-0031, dated August 4, 2010
  - Commission directed the staff to consider how the Enforcement Policy could best reflect that most fuel cycle facilities had voluntarily developed CAPs
  - Commission directed that the approach should provide incentives for licensees to maintain [adequate] CAPs as an important facet of sustaining high safety and security performance

- SRM-SECY-09-0190, dated, August 27, 2010
  - Commission directed the staff to provide fuel cycle facilities with credit for having [adequate] CAPs

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Background (continued)

- SRM-SECY-11-0140, dated January 5, 2012
  - Commission directed the staff to proceed with the development and implementation of the incentives for licensees to maintain an [adequate] CAP

- SRM-SECY-12-0047, dated November 28, 2012
  - Commission approved the revision to the Enforcement Policy that allowed NRC-identified SL IV violations to be dispositioned as NCVs, if the staff finds that the licensee has implemented an adequate CAP, and that the criteria in Section 2.3.2.a of the Enforcement Policy are met

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CAP Guidance Development

- Draft NUREG-2154 (developed with industry input)
  - Published for comment in February 2013
- Comment letter received from the Nuclear Energy Institute (NEI)
  - Comment recommended converting draft NUREG to RG to ease implementation
- Staff assessed comment and agreed that a RG was a suitable mechanism for providing guidance
  - DG-3044 was developed

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CAP Guidance Development: DG-3044/RG 3.75 Content

- DG-3044 maintained the same basic elements as those found in draft NUREG-2154
- Staff regulatory guidance in the guide identifies elements of an acceptable corrective action program (CAP)
  - CAP organization
  - Written policies, programs, and procedures that describe the CAP
  - Identification, reporting, and documentation of safety and security issues
  - Evaluation and classification of the significance of safety and security issues and determination of the cause of significant issues
  - Development and implementation of corrective actions and preventive actions, as appropriate
  - Assessment process to evaluate CAP effectiveness

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Process to Use RG 3.75

Licensee commits to RG or alternate CAP described in a LAR

Commitment to RG or alternate CAP is captured as a license condition

Once licensee has developed and implemented CAP policies and procedures to satisfy the RG commitments, licensee notifies the NRC that it is ready for inspection of its CAP program

Inspection of licensee CAP is performed to verify (1) adequacy of implementing policies and procedures and (2) effectiveness of CAP implementation

After successful completion of all elements above, NRC notifies licensee that it will begin to disposition NRC-identified SL IV violations as NCVs if criteria in Section 2.3.2.a of the NRC Enforcement Policy are met

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Status

- DG-3044 was issued for public comment on February 12, 2014, in the *Federal Register*
  - Public meeting – March 5, 2014
  - Public comment period ended on March 14, 2014
    - NEI letter with comments, dated March 14, 2014 (ML14086A509)
- Briefing to ACRS Subcommittee on May 7, 2014
- RG 3.75 being routed for final concurrence
  - Minor changes based on public and internal comments

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Next Steps

- Develop CAP inspection procedure
- Resolve ACRS comments
- Completion of final concurrence reviews
- Issue final RG in the *Federal Register*

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Conclusions

- RG 3.75 responsive to stakeholder feedback
- RG 3.75 needed for regulatory stability and clarity
- Issuance of RG 3.75 completes Task I.C of the RFCOP Project Plan

Backup – Section 2.3.2.a of the NRC Enforcement Policy

a. Licensees and Nonlicensees with a Corrective Action Program[1]

1. The licensee or nonlicensee must place the violation into a corrective action program to restore compliance and address recurrence.

2. The licensee or nonlicensee must restore compliance (or demonstrate objective evidence of plans to restore compliance) within a reasonable period of time (i.e., in a timeframe commensurate with the significance of the violation after a violation is identified.

3. The violation must either not be repetitive as a result of inadequate corrective action, or, if repetitive, the repetitive violation must not have been identified by the NRC. This criterion does not apply to violation associated with green ROP findings.

4. The violation must not be willful.

[1] The NRC will credit a formal corrective action program that has been inspected and found to meet regulatory guidance, industry standards, or both.

Backup – Section 2.3.2.b of the NRC Enforcement Policy

b. All other Licensees and Nonlicensees

1. The licensee or nonlicensee identified the violation.

2. The licensee or nonlicensee corrected or committed to correcting the violation within a reasonable period of time by specific corrective action committed to by the end of the inspection, including immediate corrective action and comprehensive action to prevent recurrence.

3. The violation is not repetitive as a result of inadequate corrective action.

4. The violation is not willful.

Revised Fuel Cycle Oversight Process

ACRS

June 11, 2014

Purpose

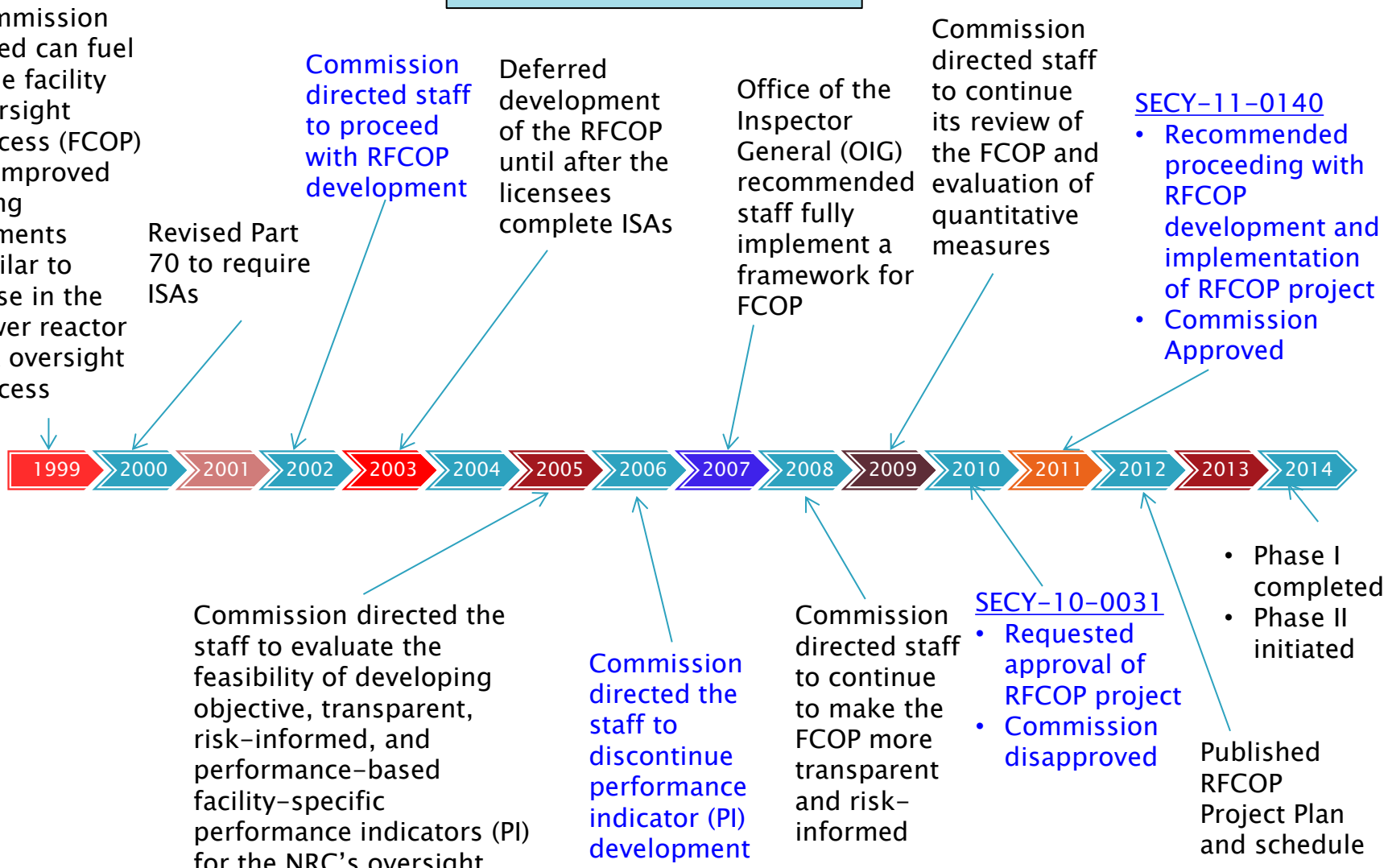
- To provide the ACRS the status of the Revised Fuel Cycle Oversight Process (RFCOP) project and details on the re-baselined schedule

Background RFCOP Project

Scope of FCOP

- Oversight process for fuel cycle facilities licensed per:
  - 10 CFR Part 70, “Domestic Licensing of Special Nuclear Material”
  - 10 CFR Part 40, “Domestic Licensing of Source Material”; or
  - 10 CFR Part 76, “Certification of Gaseous Diffusion Plants”

RFCOP History



Previous ACRS Presentation

- RFCOP discussed with ACRS in October 2011
  - ACRS letter (ML11284A143)
- Briefed the ACRS Subcommittee on Radiation Protection and Nuclear Materials
  - May 7, 2014

RFCOP Project Phases and Deliverables

- SECY-11-0140, Enhancements to the Fuel Cycle Oversight Process
  - Phase I:
    - Activity I.A, Revised Enforcement Policy
    - Activity I.B, Enhanced Core Inspection Program
    - Activity I.C, Develop Effective CAP Guidance
      - Detailed presentation to be provided
    - Activity I.D, Develop CAP Inspection Procedure
    - Activity I.E, CAP Licensing Actions
    - Activity I.F, Determine Issue Characterization definition
    - Activity I.G Develop More-Than-Minor Non-Compliance Threshold

RFCOP Project Phases and Deliverables (Continued)

- Phase II:
  - Activity II, Cornerstones
  - Activity III, Qualitative Fuel Cycle Significance Determination Process (SDP)
  - Activity IV, Performance Assessment Process
  - Activity V, Supplemental Inspection Program
- Phase III:
  - Activity VI, Pilot Program
  - Activity VII, Quantitative Fuel Cycle Significance Determination Process
  - Activity VIII, Implementation of the Fuel Cycle Oversight Process

Status RFCOP Project

Overall Project Status

- Phase I – Expected Completion June 2014
- Phase II – Initiating July 2014
- Phase III – Planned

Phase I Accomplishments

- Issued the revised Enforcement Policy
- Issued 14 IPs and 1 IMC Appendix
- Issuing CAP RG
- LES CAP determined to be adequate
- Issuing a revised IMC 0616 with the More-Than-Minor non-compliance threshold definition (examples)
- Completed performance deficiency definition
  - Non-compliance with requirements/regulation
  - Obtained industry agreement
- Issuing CAP IP
  - Considered lessons learned from the LES CAP review

Phase 1 to be completed by June 2014

Phase II & III Re-baseline Efforts and Considerations

Existing Plan & Schedule

- Details (RFCOP Project Plan, July 2012 memo (ML12167A229))
  - Phase I
    - First two years planned in detail
  - Phase II and III
    - The plan provided only a high-level overview
- SRM did not make the RFCOP project a top priority
  - Lower than post-Fukushima response actions or Honeywell restart
  - Resources for RFCOP consistent with priority
  - Cumulative effect of regulations is a consideration
    - NEI Letter (April 3, 2013)
      - Re-baseline of inspection program
      - Generic risk insights

Re-baseline Activity

- Assumptions
  - Includes all original deliverables
  - “Not a top priority” project
  - Continue interactions with external stakeholders
  - Pilot program assumes all fuel facilities participation
- Considerations
  - Step-by-step tasks necessary to produce deliverables
  - Parallel efforts versus series efforts
  - Adding ACRS interactions (Notation Vote Papers)
  - Cumulative Effects of Regulation (CER)
    - Adding additional external stakeholder interactions

Re-Baseline Results

SRM Actions for SECY-11-0140	Proposed COMSECY Request
Phase II - RFCOP Framework Development	
Activity II, Cornerstones **(Notation Vote Paper on Cornerstones)**	Reset deliverable schedule
PHASE III – Pilot, Lessons Learned and Implementation	
Activity VI, Pilot Program **(Notation Vote paper for permission to perform Pilot Program)**	Reset deliverable schedule
Activity VI, Pilot Program **(Notation Vote paper for on the results of the pilot, including the proposed action matrix, any necessary changes to the revised FCOP, and the staff's recommendations for full implementation)**	Reset deliverable schedule

Plan to engage ACRS on each Notation Vote Paper prior to providing it the Commission

Conclusion

- Recommending Commission reset some SRM ticketed deliverables

Activities Going Forward

Actions

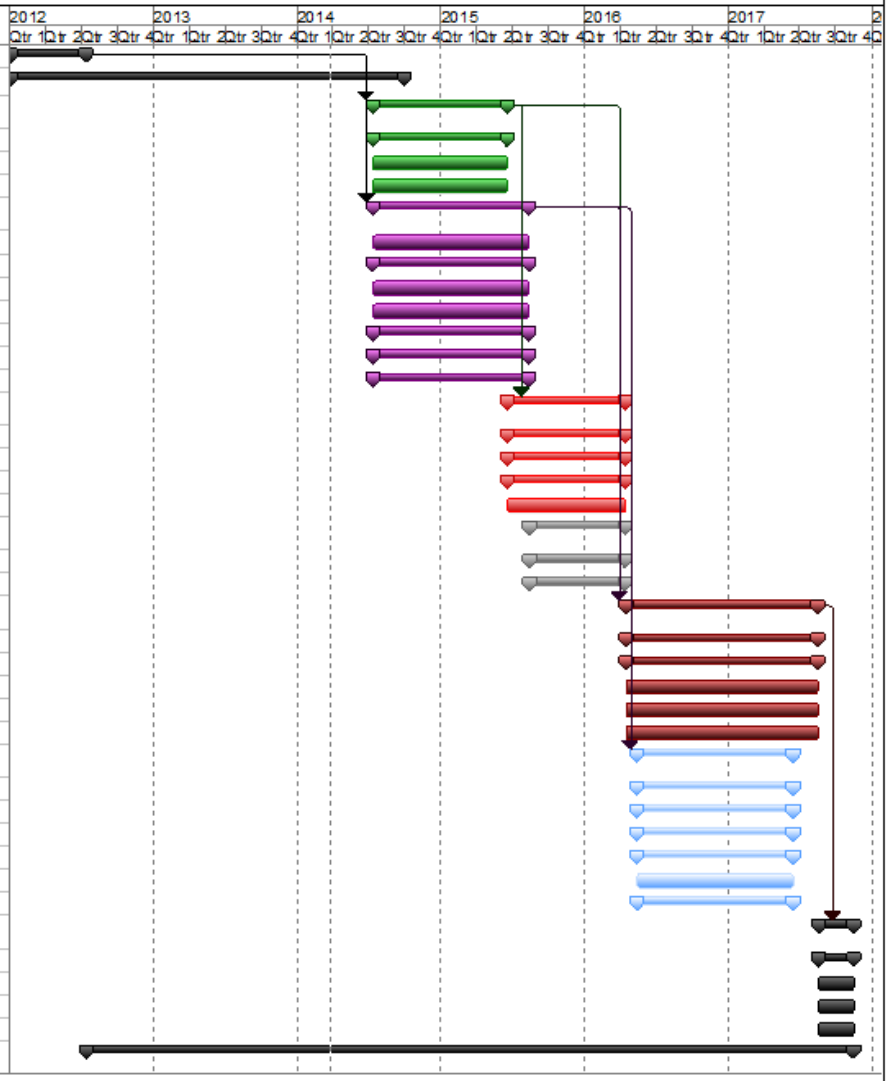
- Near-term
  - Re-Established RFCOP Steering Committee
  - Submit COMSECY to Commission
  - Initiate Phase II -- Start work on Cornerstones
  - Issue revised RFCOP Project Plan and schedule
- Long-term
  - Issue Commission Notation Vote Papers on:
    - Cornerstones
    - Planned Pilot Program
    - Pilot Program Results and RFCOP implementation

Backup Slides

Current RFCOP Project Schedule

OVERALL TIMELINE FOR THE REVISED FUEL CYCLE OVERSIGHT PROCESS

ID	Task Name
1	Project Plan (Task 3 SRM-SECY-11-0140)
6	**I. CAP, Issue Characterization, Inspection Program Improvements**
53	**II. Cornerstones**
54	A. Identify proposed cornerstones and develop their basis
59	B. Prepare notation vote paper for cornerstones (Task 1 SRM SECY-11-0140)
60	C. Revise the IPs to incorporate cornerstone development
61	**III. Qualitative Fuel Cycle SDP**
62	A. Develop Representative Testing Sample
63	B. Develop Qualitiative SDP Conceptual Framework
68	C. Test SDP
69	D. Benchmark the results of the SDP test
70	E. Engage stakeholders about the SDP test and benchmark
73	F. Develop SDP in EP & public and occupational radiation safety
78	G. Develop SDP for Cat I & III facilities in security and MC&A
83	**IV. Performance Assessment Process**
84	A. Develop Action Matrix
88	B. Incorporate the Cross Cutting Issues
91	C. Develop Integrated Assessment Process
94	D. Incorporate Action Matrix into Inspection Program
95	**V. Supplemental Inspection Program**
96	A. Develop basis for supplemental inspection program
99	B. Develop Inspection Procedure(s)
102	**VI. Pilot Program**
103	A. Pilot - Notation vote paper (Task 7 SRM-SECY-11-0140)
106	B. Conduct Pilot
109	C. Assess Pilot Results
110	D. Revise FCOP Based on Pilot
111	E. Implementation - Notation vote paper (Tasks 2 & 5 SRM-SECY-11-0140)
112	**VII. Quantitiative Fuel Cycle SDP**
113	A. Determine Where to Explore Quantitative Insights
115	B. Develop and validate human reliability assessment tools
117	C. Develop and validate hardware reliability risk assessment tools
119	D. Develop the risk-significance model for fuel cycle facilities
124	E. Test the quantitative fuel cycle SDP (Task 4 SRM-SECY-11-0140)
125	F. Engage stakeholders about the results of SDP test
128	**VIII. Implementation of the FCOP**
129	A. Develop Transition Process
132	B. Conduct Inspector FCOP Training
133	C. End the Licensee Performance Review program
134	D. Initiate FCOP
135	**IX. Project Management**



Published Schedule

Task Name	Original Schedule Finish Date	Status
SRM for SECY 11-0140 issued	01/05/12	Complete
PHASE I – Corrective Action Program, Issue Characterization, and Inspection Program Improvements		
Activity I.A, Revised Enforcement Policy	12/28/12	Complete
Activity I.B, Enhanced Core Inspection Program	06/20/14	Complete
Activity I.C, Develop Effective CAP Guidance	07/31/13	June2014
Activity I.D, Develop CAP Inspection Program	03/07/14	June 2014
Activity I.E, CAP Licensing Actions	09/30/14	Complete
Activity I.F, Determine Issue Characterization definition	03/29/13	Complete
Activity I.G Develop More-Than-Minor Threshold	06/26/14	June 2014
Phase II - RFCOP Framework Development		
Activity II, Cornerstones	06/19/15	Initiating (Current scheduled start 7/14/14)
Activity III, Qualitative Fuel Cycle Significance Determination Process (SDP)	08/14/15	Future
Activity IV, Performance Assessment Process	04/15/16	Future
Activity V, Supplemental Inspection Program	04/15/16	Future
PHASE III – Pilot, Lessons Learned and Implementation		
Activity VI, Pilot Program	08/18/17	Future
Activity VII, Quantitative Fuel Cycle Significance Determination Process	06/16/17	Future
Activity VIII, Implementation of the Fuel Cycle Oversight Process	11/17/17	Future

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Adding Accelerator-Driven Subcritical Operating Assembly to the Definition of Utilization Facility

Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
June 2014

Purpose

- To discuss SECY paper presenting staff's proposed approach to licensing SHINE's irradiation units

- Paper recommends issuance of a direct final rule adding SHINE's irradiation units to the definition of *utilization facility* under 10 CFR Part 50

- Given the unique design and operation of SHINE's irradiation units, this rule will allow NRC staff to:
  - Implement the most appropriate licensing and technical review standards to protect the public health and safety
  - Conduct an efficient and effective review of the SHINE construction permit application
  - Clarify appropriate regulatory requirements to stakeholders

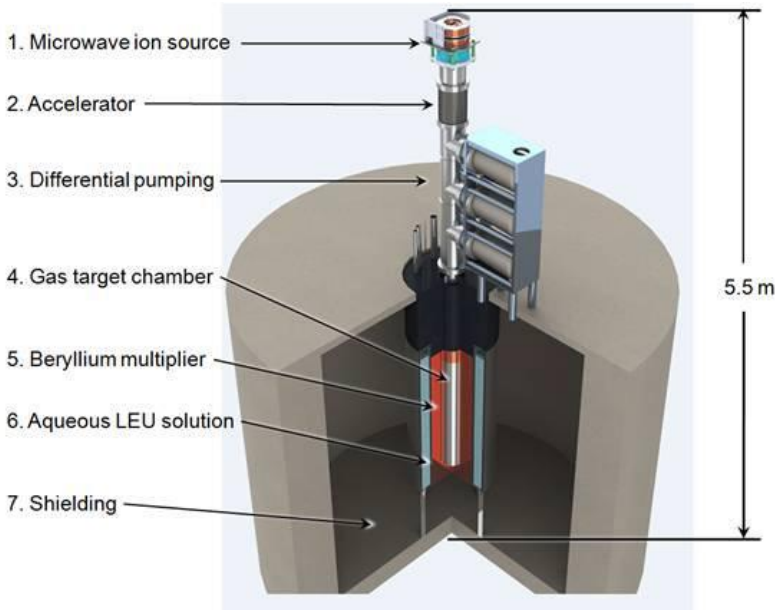
Summary of Issue

- SHINE has submitted a 10 CFR Part 50 construction permit application, requesting to construct irradiation units to:
  - Produce ^{99}Mo through uranium fission
  - Remain subcritical under “all” conditions
- The most appropriate safety and licensing considerations for SHINE’s irradiation units are similar to non-power reactors
- SHINE’s irradiation units do not meet the existing definition of *utilization facility* in 10 CFR Part 50, however
- The Atomic Energy Act provides authority to the Commission to define a *utilization facility* by rule

Overview of the SHINE Application

- Two-part construction permit application
  - Environmental report (March 26, 2013)
  - Preliminary Safety Analysis Report (May 31, 2013)
- SHINE proposes to produce ^{99}Mo from uranium fission
  - Irradiation facility (8 irradiation units)
  - Radioisotope production facility (3 hot cell structures)
- Proposes to construct facility in Janesville, WI

SHINE Irradiation Unit Technology



- Each subcritical irradiation unit has a:
  - Neutron driver (accelerator)
  - Target solution vessel
  - Light water pool
- Reactivity control mechanisms:
  - TSV fill volume
  - Uranium concentration in solution
  - Uranium enrichment
  - Temperature
  - Pressure

SHINE Licensing Proposal

- Construction permit application requests single license for a *production facility* as defined in 10 CFR Part 50

- Irradiation units operate independently of the radioisotope production facility and are also not inherently *production facilities*

- Irradiation unit design is not consistent with traditional fuel cycle facility design

- Radioisotope production facility consists of 3 hot cell structures, which meet the 10 CFR 50.2 definition of *production facility*

Existing 10 CFR Part 50 Definitions

- 10 CFR Part 50 only applies to the licensing of production and utilization facilities

- 10 CFR 50.2 defines *utilization facility* as any nuclear reactor other than one designed or used primarily for the formation of plutonium or U-233

- 10 CFR 50.2 defines *nuclear reactor* as an apparatus, other than atomic weapon, designed or used to sustain nuclear fission in a self supporting chain reaction

- SHINE's irradiation unit does not meet the definition of either a *nuclear reactor* or *utilization facility*

Existing 10 CFR Part 50 Definitions (continued)

- 10 CFR 50.2 defines *production facility* as:

    1) Any nuclear reactor designed or used primarily for the formation of plutonium or U-233; or

    2) Any facility designed or used for the separation of the isotopes of plutonium…; or

    3) Any facility designed or used for the processing of irradiated materials containing special nuclear material…

- SHINE's irradiation unit does not meet any of these definitions of *production facility*

Processing of Irradiated Materials

- While not defined in the Atomic Energy Act or 10 CFR, staff believes processing does not include the irradiation and fission of materials containing special nuclear material

- Treatment of SHINE's target solution is analogous to treatment of reactor fuel

- All fuel in existing *utilization facilities* undergoes irradiation and fission
  - Not considered "processing of irradiated materials containing SNM," otherwise all existing reactors would be classified as *production facilities* per 10 CFR 50.2

Part 70 Approach Not Recommended

- Licensing irradiation units as fuel cycle facilities is not recommended because:
  - Irradiation unit operating conditions and safety considerations closely align with 10 CFR Part 50
  - Fuel cycle facilities are subcritical by a significant margin (0.05, k_{eff} = 0.95) as discussed in NRC guidance
  - Irradiation unit routine operating margin of subcriticality less than what has been previously approved for 10 CFR Part 70 licensees

- However, SHINE will need 10 CFR Part 70 license to receive, possess, and use special nuclear material

Similarities to Non-power Reactors

- Each irradiation unit operates at a thermal power level comparable to liquid homogeneous and non-power reactors typically licensed under 10 CFR Part 50 as utilization facilities

- Consequently, the safety considerations are similar with regard to:
  - Fission heat removal
  - Decay heat generation
  - Reactivity feedback mechanisms
  - Fission gas release
  - Radiolytic decomposition of water
  - Fission product buildup
  - Accident scenarios

Atomic Energy Act and Commission Authority

- The term *utilization facility* is defined as:

    1) Any equipment or device, except an atomic weapon, determined by rule of the Commission to be capable of *making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public*…; or

    2) Any important component part especially designed for such equipment or device as determined by the Commission.

- As provided by the Atomic Energy Act, the Commission has the authority to determine by rule that SHINE's irradiation unit is a utilization facility

NRC Proposed Licensing Approach

- License SHINE's irradiation unit under 10 CFR Part 50 by modifying the definition of *utilization fa*cility through a direct final rule

- *Utilization facility* would be defined as:

    1) Any nuclear reactor other than one designed or used primarily for the formation of plutonium or U-233,

       and

    2) An accelerator-driven subcritical operating assembly used for the irradiation of materials containing special nuclear material and described in the application assigned docket number 50-608

Use of Direct Final Rule

- Rulemaking considered to be non-controversial
  - Proposed rulemaking consistent with Atomic Energy Act definition of utilization facility
  - Allows NRC staff to apply most appropriate licensing and technical review standards
  - Limited scope of rule only affects the irradiation units proposed by SHINE under docket 50-608
- Unlikely to receive significant adverse comments
  - Safety and environmental concerns related to the SHINE application will be addressed in a hearing separate from this rulemaking
- Rulemaking aligns with objectives of American Medical Isotopes Production Act of 2012

Benefits and Impact of Rulemaking

- NRC would have exclusive jurisdiction over the SHINE facility, including the licensing and oversight of the accelerators associated with the irradiation units

- 10 CFR Part 50 provides most appropriate and efficient licensing and technical review process

- SHINE construction permit application already includes the majority of the information necessary for the review of a utilization facility under 10 CFR Part 50

- Minimal impact on SHINE's construction permit application for a 10 CFR Part 50 *production facility*

Next Steps and Recommendation

- SECY with EDO for final review and concurrence
- Staff plans to prepare an environmental impact statement
  - Conducted two public scoping meetings in Janesville, Wisconsin in July 2013
  - Conducted a site audit in August 2013
- Staff is developing an initial set of requests for additional information
- Recommend direct final rule adding SHINE's irradiation unit to the definition of *utilization facility* under 10 CFR Part 50 to continue to review SHINE construction permit application

Full-Scope Site Level 3 PRA Project Briefing

Advisory Committee on Reactor Safeguards

June 11, 2014

Alan Kuritzky, Mary Drouin, Kevin Coyne
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Office of Nuclear Regulatory Research
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Outline

- Background
- Project Philosophy
- Potential Regulatory Uses
- Infrastructure
- Previous ACRS Subcommittee Interactions
- Technical Approach
- Vogtle Site/Plant Information
- Status
- Concluding Remarks

Background

- Commission paper (SECY-11-0089), dated 7/7/11, provided three options for undertaking Level 3 probabilistic risk assessment (PRA) activities
  1) Maintain status quo
  2) Focused research to address gaps before proceeding
  3) Conduct a full-scope, comprehensive site Level-3 PRA
- In a staff requirements memorandum (SRM) dated 9/21/2011 the Commission approved a modified version of Option 3
- SRM-SECY-11-0089 also requested Staff's plans for applying project results to the NRC's regulatory framework (SECY-12-0123)

Project Objectives

- Develop a Level 3 PRA, generally based on current state-of-practice methods, tools, and data,* that (1) reflects technical advances since completion of the NUREG-1150 studies, and (2) addresses scope considerations that were not previously considered (e.g., multi-unit risk)
- Extract new insights to enhance regulatory decisionmaking and to help focus limited agency resources on issues most directly related to the agency's mission to protect public health and safety
- Enhance NRC staff's PRA capability and expertise and improve documentation practices to make PRA information more accessible, retrievable, and understandable
- Obtain insight into the technical feasibility and cost of developing new Level 3 PRAs

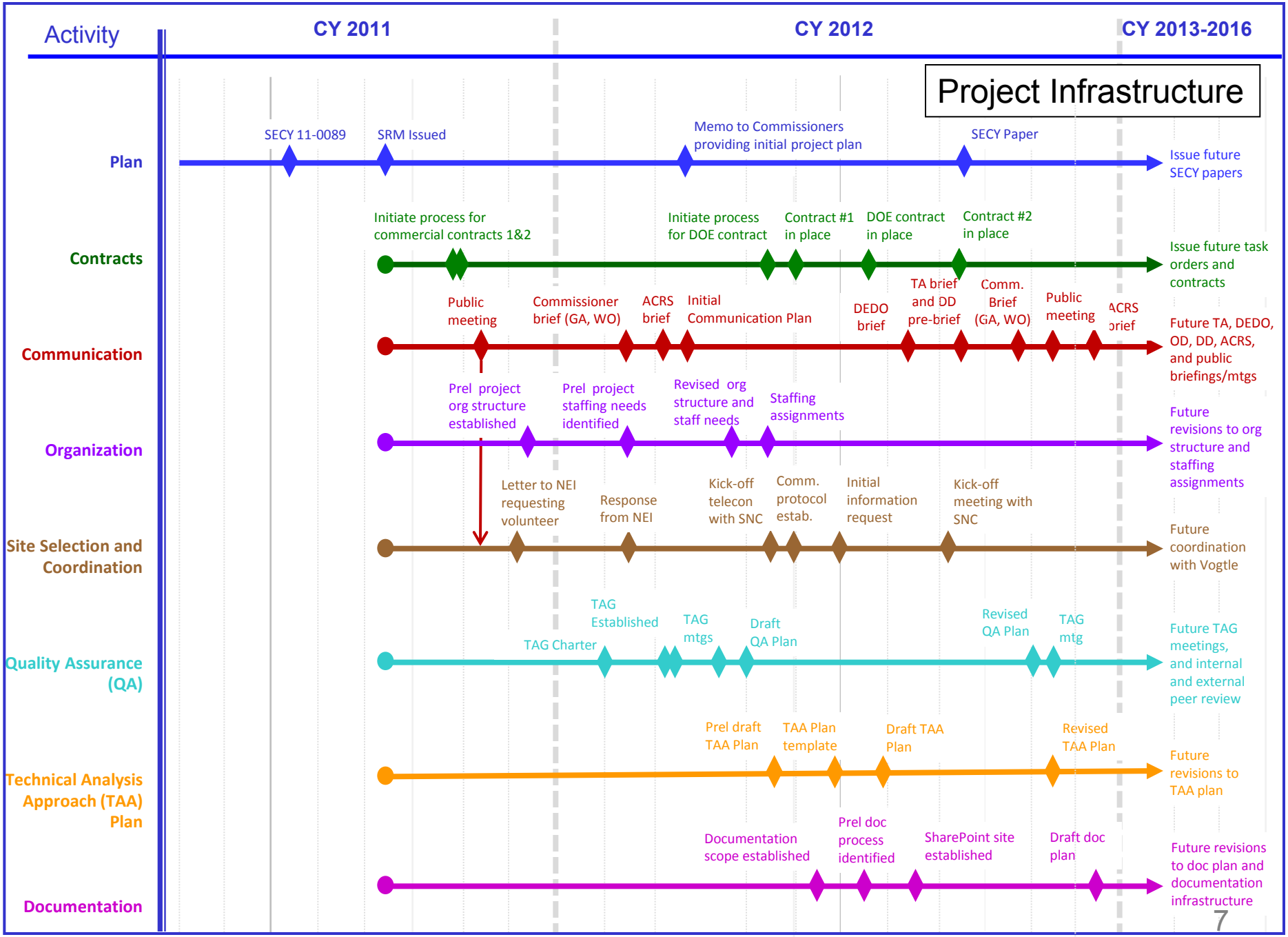
* "State-of-practice" methods, tools, and data are those that are routinely used by the NRC and licensees or have acceptance in the PRA technical community.

Project Scope

- Full-Scope Site Level 3 PRA – Includes all major site radiological sources (i.e., all reactor cores, spent fuel pools, and dry storage casks on site), all internal and external hazards, and all modes of reactor operation
- Incorporates improvements in PRA technology and changes in plant operational performance and safety since completion of NUREG-1150
- Study will be for a single multi-unit site; therefore, applicability to a range of sites and technical issues will be limited

Potential Regulatory Uses

- Potential regulatory uses of the Level 3 PRA can be categorized as follows:
  - Enhancing the technical basis for the use of risk information
  - Improving the PRA state-of-practice
  - Identifying safety and regulatory improvements
  - Supporting knowledge management
- Lists of potential regulatory uses in each of these categories are provided in SECY-12-0123


Activity
CY 2011
CY 2012
CY 2013-2016
Project Infrastructure
Plan
SECY 11-0089
SRM Issued
Memo to Commissioners providing initial project plan
SECY Paper
Issue future SECY papers
Contracts
Initiate process for commercial contracts 1&2
Initiate process for DOE contract
Contract #1 in place
DOE contract in place
Contract #2 in place
Issue future task orders and contracts
Communication
Public meeting
Commissioner brief (GA, WO)
ACRS brief
Initial Communication Plan
DEDO brief
TA brief and DD pre-brief
Comm. Brief (GA, WO)
Public meeting
ACRS brief
Future TA, DEDO, OD, DD, ACRS, and public briefings/mtgs
Organization
Prel project org structure established
Prel project staffing needs identified
Revised org structure and staff needs
Staffing assignments
Future revisions to org structure and staffing assignments
Site Selection and Coordination
Letter to NEI requesting volunteer
Response from NEI
Kick-off telecon with SNC
Comm. protocol estab.
Initial information request
Kick-off meeting with SNC
Future coordination with Vogtle
Quality Assurance (QA)
TAG Charter
TAG Established
TAG mtgs
Draft QA Plan
Revised QA Plan
TAG mtg
Future TAG meetings, and internal and external peer review
Technical Analysis Approach (TAA) Plan
Prel draft TAA Plan
TAA Plan template
Draft TAA Plan
Revised TAA Plan
Future revisions to TAA plan
Documentation
Documentation scope established
Prel doc process identified
SharePoint site established
Draft doc plan
Future revisions to doc plan and documentation infrastructure

Previous ACRS Reliability and PRA Subcommittee Interactions

- March 2012 – Initial project plan
- December 2012 – Technical Analysis Approach Plan (TAAP) for reactor PRA
- May 2013 – TAAP for spent fuel pool and dry cask storage PRAs
- July 2013 – Integrated site risk and HRA (open); initial Level-1 internal event model results (closed)
- February 2014 – Project status, with focus on Level 2 PRA and Level 3 PRA (open); technical discussions on preliminary internal event Level 1 and Level 2 PRA (closed)
- Several informal meetings (Feb'12, Jul'13, Jan'14, Mar'14)

Principal Project Tools

- SAPHIRE 8 – NRC's standard software application for performing PRAs; has increased capability for handling large, complex models
- MELCOR – Used for performing thermal-hydraulic analysis to determine system success criteria and accident sequence timing, and for modeling severe accident progression for reactors, spent fuel pools, and dry storage casks
- MACCS2 – Used to evaluate public consequences of severe accidents at diverse reactor and non-reactor facilities

Technical Analysis Approach

- Leveraging licensee's peer-reviewed internal event, flood, and fire PRA models, and information from on-going licensee seismic PRA
- Using state-of-practice for reactor Level 2, Level 3, and LPSD models, consistent with draft PRA standards
- Spent fuel pool and dry cask storage PRAs largely based on previous studies
- Integrated risk model approach involves developing simplified model and modifying based on insights from individual risk models
- Simplified HRA approach developed for beyond internal event, internal flood and internal fire; e.g., Level 2, LPSD, integrated risk, dry cask storage
- Project management approach structured to enhance integration of individual scope elements

Technical Analysis Approach Plan (1 of 2)

- Provides guidance for developing the Level 3 PRA
  - Enhances consistency in the development of PRA models across technical areas
  - Provides traceability of how the PRA models were constructed
  - Shows how the technical elements interface with each other
  - Supports development of review criteria for assessing the technical acceptability of the PRA models
- Draft ("work in progress") version (Rev. 0a) provided to Technical Advisory Group and ACRS for comment, and released publicly
- Subsequent draft (Rev. 0b) has also been released publicly (ADAMS Accession No. ML13296A064)
- Ultimately, TAAP will be updated to reflect actual approach taken

Technical Analysis Approach Plan (2 of 2)

- Overall technical approach
- Success criteria
- Systems analysis
- Data analysis
- Human reliability analysis
- Structural analysis
- Fragility analysis
- Hazard analysis
- Uncertainty analysis
- Reactor, at-power, internal hazard PRA (Levels 1-3)
- Reactor, at-power, external and other hazard PRA (Levels 1-3)
- Reactor, low power and shutdown, all hazard PRA (Levels 1-3)
- Spent fuel pool PRA
- Dry cask storage PRA
- Integrated site PRA
- Quality assurance

Vogtle Site/Plant Information

- Principal radiological sources on site:
  - Two Westinghouse 4-loop PWRs with large, dry containments (Units 3 and 4 are not within scope)
  - Two spent fuel pools (almost always hydraulically connected through the cask pit)
  - Two Independent Spent Fuel Storage Installations (ISFSIs)
- Atypical emergency planning zone
- Recent probabilistic seismic hazard models indicate higher seismic hazard
- Plant elevation greatly minimizes risk from external flooding
- Limited shared systems

Project Status (1 of 4)

Reactor Risk Assessment --

- Level 1, at-power, internal event and flood model – R01 model complete
  - Several modifications had to be made to SAPHIRE
  - Further investigation of licensee model identified additional areas for modification
- Level 2, at-power, internal events model – substantial progress
  - Completed MELCOR model for Unit 1 reactor and containment
  - Quantified plant damage states and performed numerous representative scenario analyses
  - Developed preliminary probabilistic logic model and release category framework
  - Finalizing all pieces (e.g., HRA) and will be starting quantification soon

Project Status (2 of 4)

Reactor Risk Assessment (Continued) --

- Level 3 (consequence analysis) – work progressing
  - Obtained all major input data needed for development of MACCS2 input decks
  - Documenting technical basis for MACCS2 input parameters and datasets
  - Performing MACCS2 development work in parallel with initial analyses
- Level 1, at-power, fire, seismic, and other external hazards – work underway
  - Completed high wind PRA model
  - Completed initial seismic PRA model (based on most recent hazard curves and preliminary plant-specific fragilities provided by the licensee)
  - Internal fire PRA modeling is in progress
  - Preliminarily screened out all "other hazards," including external flooding
- Level 1, low power and shutdown modeling – just beginning

Project Status (3 of 4)

Spent Fuel Pool Risk Assessment --

- Completed SCALE analysis
- Developed simplified MELCOR model
- Completed preliminary sequence timing analysis
- Initiated accident sequence modeling

Dry Cask Storage Risk Assessment --

- Gathered and reviewed information from NRC and Vogtle
- Monitored cask loading campaign in November 2013
- Work progressing on initiating event analysis
- Just beginning structural analysis on fuel and cask drops

Project Status (4 of 4)

Integrated Site Risk Assessment --

- Developed Technical Analysis Approach Plan section
- Identifying dependencies within and across risk sources
- Developing a simplified model based on prioritization and dependency analysis

ASME/ANS PRA Standard-Based Peer Reviews --

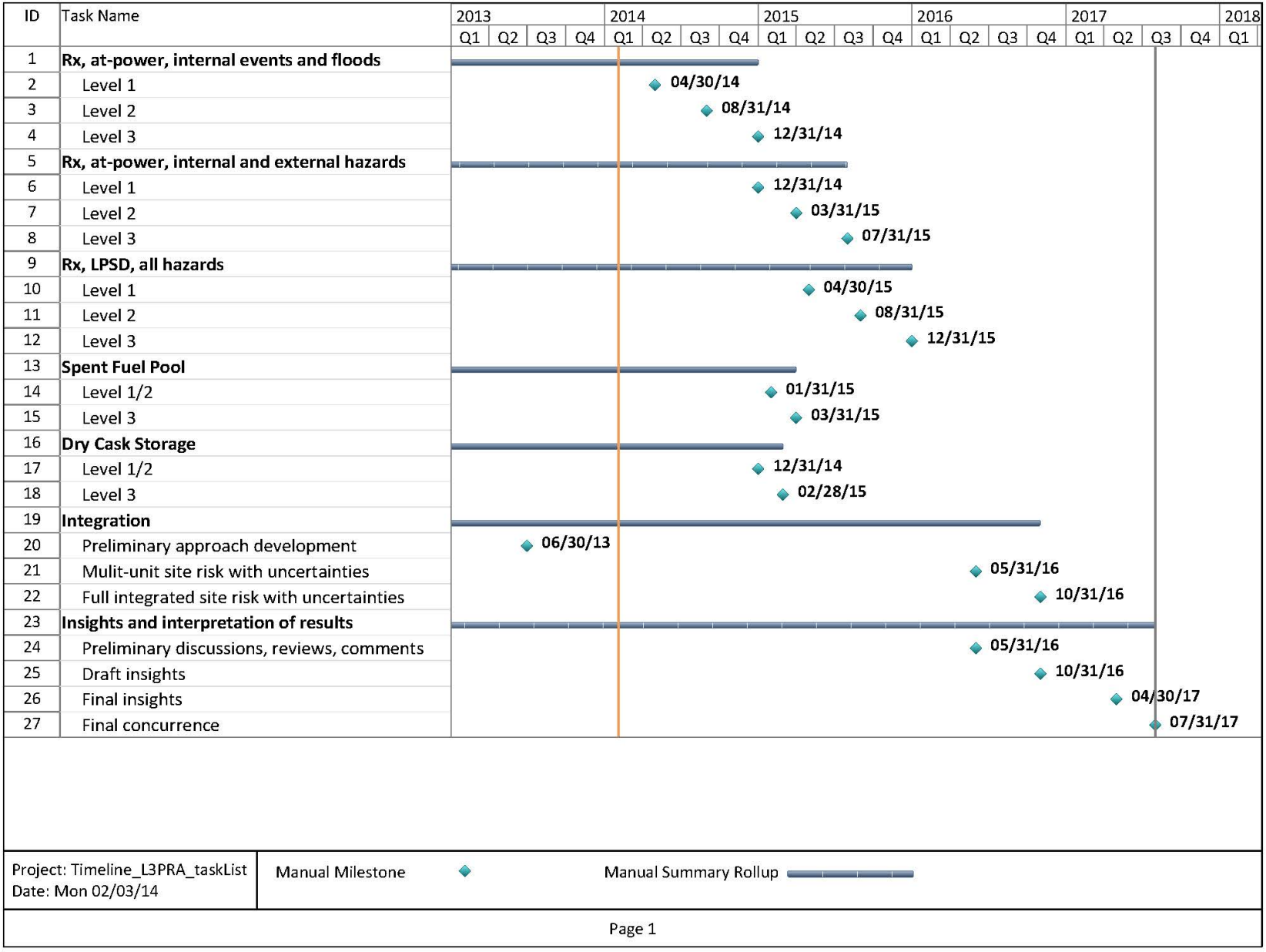
- PWR Owner's Group (PWROG) agreed to support four peer reviews in CY 2014
- Three reviews will focus on different L3PRA models; fourth review will focus on developing review criteria for areas without current (approved or draft) PRA standards

Schedule Challenges (1 of 2)

- Administrative challenges
  - Funding availability
    - Reductions in FY2013 budget and delays in FY2013 funding
    - FY2014 budget has been restored to initial planning level (i.e., ~$2M), but delays in sequestration decisions already impacted Level 3 PRA contracts for 1st quarter of FY2014
  - Staff diversion
    - Spent fuel pool study and COMSECY paper
    - Waste confidence decision
    - NFPA 805 implementation
    - Near-Term Task Force (NTTF) Recommendations 1, 2.1, 2.3, 3, and 5
    - Risk Management Regulatory Framework (RMRF)
  - Licensee resource challenges in responding to requests for information

Schedule Challenges (2 of 2)

- Technical challenges
  - Greater than expected effort to develop project infrastructure, especially for technical approach plans, information exchange protocols, project documentation and quality assurance, and contracting actions
  - Complications in converting licensee model from industry software to NRC software (SAPHIRE) and in enhancing SAPHIRE to integrate Level 1 and Level 2 PRA
  - Additional effort to modify licensee's Level 1 internal event and flood PRA model, as part of taking "ownership" of the model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Task Name
2013
2014
2015
2016
2017
2018
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1 Rx, at-power, internal events and floods
2 Level 1
3 Level 2
4 Level 3
5 Rx, at-power, internal and external hazards
6 Level 1
7 Level 2
8 Level 3
9 Rx, LPSD, all hazards
10 Level 1
11 Level 2
12 Level 3
13 Spent Fuel Pool
14 Level 1/2
15 Level 3
16 Dry Cask Storage
17 Level 1/2
18 Level 3
19 Integration
20 Preliminary approach development
21 Mulit-unit site risk with uncertainties
22 Full integrated site risk with uncertainties
23 Insights and interpretation of results
24 Preliminary discussions, reviews, comments
25 Draft insights
26 Final insights
27 Final concurrence
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Project: Timeline_L3PRA_taskList
Date: Mon 02/03/14
Manual Milestone
Manual Summary Rollup
Page 1

Key Milestones – CY 2014

- Completion of initial reactor, Level 1, seismic event PRA (Summer 2014)
- Industry-led peer review of reactor, Level 1, internal event and flood PRA (July 2014)
- Industry-led peer review of reactor, Level 1, high wind and other hazards PRA (November 2014)
- Industry-led peer review of reactor, Level 2, internal event and flood PRA (November 2014)
- Completion of reactor, Level 3, internal event and flood PRA (Winter 2014/2015)
- Completion of dry cask storage, Level 1 and Level 2, PRA (Winter 2014/2015)
- Meetings and briefings:
  - Commissioner assistants briefing on project status and preliminary results (September 2014)
  - ACRS Reliability and PRA Subcommittee meeting on project status , and closed session primarily on Level 2 PRA (October 2014)
  - Public meeting on project status and preliminary results (Fall 2014)

Concluding Remarks

- Project schedule has slipped approximately 16 months
  - Further reductions in project funding or diversion of key personnel to higher priority work in FY2014 and beyond will further delay the schedule
- Robust infrastructure established
- Good collaboration with licensee
- Very successful inter-organizational collaboration and significant use of mid-career and junior staff, led by senior staff
- Progress is being made in all technical areas of the study
- Substantial challenges remain, especially administrative (i.e., staff diversion, funding availability, and access to plant information)

Update and Overview of NRC's Regulatory Analysis Guidance

ACRS Full Committee Meeting

June 11, 2014

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Purpose/Outline

- **Purpose:**
  - Provide an overview of SECY-14-0002, "Plan for Updating the U.S. NRC's Cost-Benefit Guidance"
  - Provide an overview of Staff's Regulatory Analysis Practice
- **Outline**
  - Overview of SECY-14-0002 and Status
    - Background
    - Public Interactions
    - Implementation Plan to Update Cost-Benefit Guidance
      - Current cost-benefit initiatives and related activities
      - Two-Phased Approach
    - Timeline of 2014 Cost-Benefit Activities
    - Price-Anderson Act
  - Regulatory Analysis Overview

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Overview of SECY-14-0002

- Staff submitted SECY-14-0002, "Plan for Updating U.S. NRC's Cost-Benefit Guidance" on January 2, 2014
  - Blog post published on January 21: http://public-blog.nrc-gateway.gov/2014/01/21/moving-forward-on-updating-cost-vs-benefit-analysis/
- Information paper
- High level implementation plan for two-phased approach to updating cost-benefit guidance
- No potential policy issues identified in paper but accounts for addressing policy issues in the future

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Background

- Fukushima Dai-ichi accident initiated questions regarding how NRC considers potential economic consequences (EC) of a nuclear accident

- Staff submitted SECY-12-0110, "Consideration of EC within the U.S. NRC's Regulatory Framework" in August 2012
  - Addressed the policy question: *To what extent, if any, should NRC's regulatory framework modify consideration of economic consequences of the unintended release of licensed nuclear materials to the environment?*
  - Described the current offsite property damage considerations in NRC analyses: cost-benefit determinations for regulatory, backfit, and environmental analyses
  - Recommended enhancing cost-benefit guidance (i.e., Option 2 of paper)

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Background cont'd

- SRM-SECY-12-0110 directed staff to provide a notation vote paper so it is clear how Option 2 "would help harmonize regulatory guidance across the agency" in consideration of economic consequences, including items per SRM
  - Identify what activities will be impacted by this work and describe how priorities will be modified
  - Integrate summary and analysis of how federal and international bodies assess EC into its recommendations
  - Address if and how Option 2 may influence future NRC recommendations to Congress regarding renewal of Price-Anderson Act

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Public Interactions

- Four public meetings
  - May 24, 2012 (ML12130176)
  - August 29, 2012 (ML12283A373)
  - July 29, 2013 (ML13227A201)
  - May 28, 2014 (ML14114A034)
- Two ACRS meetings
  - October 2012
  - November 2012
- Commission Meeting
  - September 11, 2012
  - Representatives from U.S. Environmental Protection Agency, Union of Concerned Scientists, American Nuclear Insurers, Health Physics Society, and Nuclear Energy Institute

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Implementation Plan for Updating Cost-Benefit Guidance

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Current Cost-Benefit Initiatives & Related Activities

- Update to Replacement Energy Cost
  - Address costs for replacement energy on short-term and long-term bases
  - Draft NUREG expected later this year
- Update to Dollar Per Person-Rem Conversion Factor
  - Guidance for monetizing health detriment (revised NUREG-1530) and process for updating in the future
  - Draft NUREG expected later this year
- Cumulative Effects of Regulation
  - SRM-SECY-12-0137: Case studies to review accuracy of NRC cost and schedule estimates; insights may inform cost-benefit updates
  - NEI provided final report with recommendations (ML14028A455) during a January 28, 2014 public meeting

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Current Cost-Benefit Initiatives & Related Activities

- Disposition of NTTF Recommendation 1
  - SRM-SECY-13-0132: The staff's proposed Improvement Activities as written were not approved by the Commission. Staff work on the Risk Management Regulatory Framework and other interrelated activities should be treated outside the scope of the NRC's post-Fukushima actions
- Qualitative Factors
  - SRM-SECY-12-0157: Staff is developing a notation vote paper seeking Commission direction on its use of qualitative factors
  - Notation vote SECY due July 2014
- Regulatory Gap Analysis
  - SRM-SECY-12-0110: Identify differences in cost-benefit practices across the NRC prior to developing new guidance*
  - Information SECY due November 2014

*With the exception of the dollar per person-rem and replacement energy updates

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Process for Identifying Gaps

	Regulatory Analyses	Backfit Analyses	Environmental Analyses
Operating Reactors	For each cell: •Regulatory Requirements •Guidance •Practice (e.g., assumptions, data source, use of qual. factors)		
New Reactors			
Materials			
Fuel Cycle Facilities			
Emergency Preparedness			

Differences across business lines

Differences across cost-benefit analyses

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Two-Phased Update Approach

- Phase I- *Administrative Changes*
  - Consolidate and clean up cost-benefit guidance (NUREG/BR-0058, NUREG/BR-0184, and NUREG-1409)
  - Restructure guidance by mid-2015

- Phase II- *Addresses potential changes in policy and methodology*
  - Process for addressing policy issues identified by gap analysis
  - Consequence and probabilistic methodology review
  - MELCOR Accident Consequence Code System (MACCS)
  - Periodic review of cost-benefit guidance
  - Begin after gap analysis; multi-year phase

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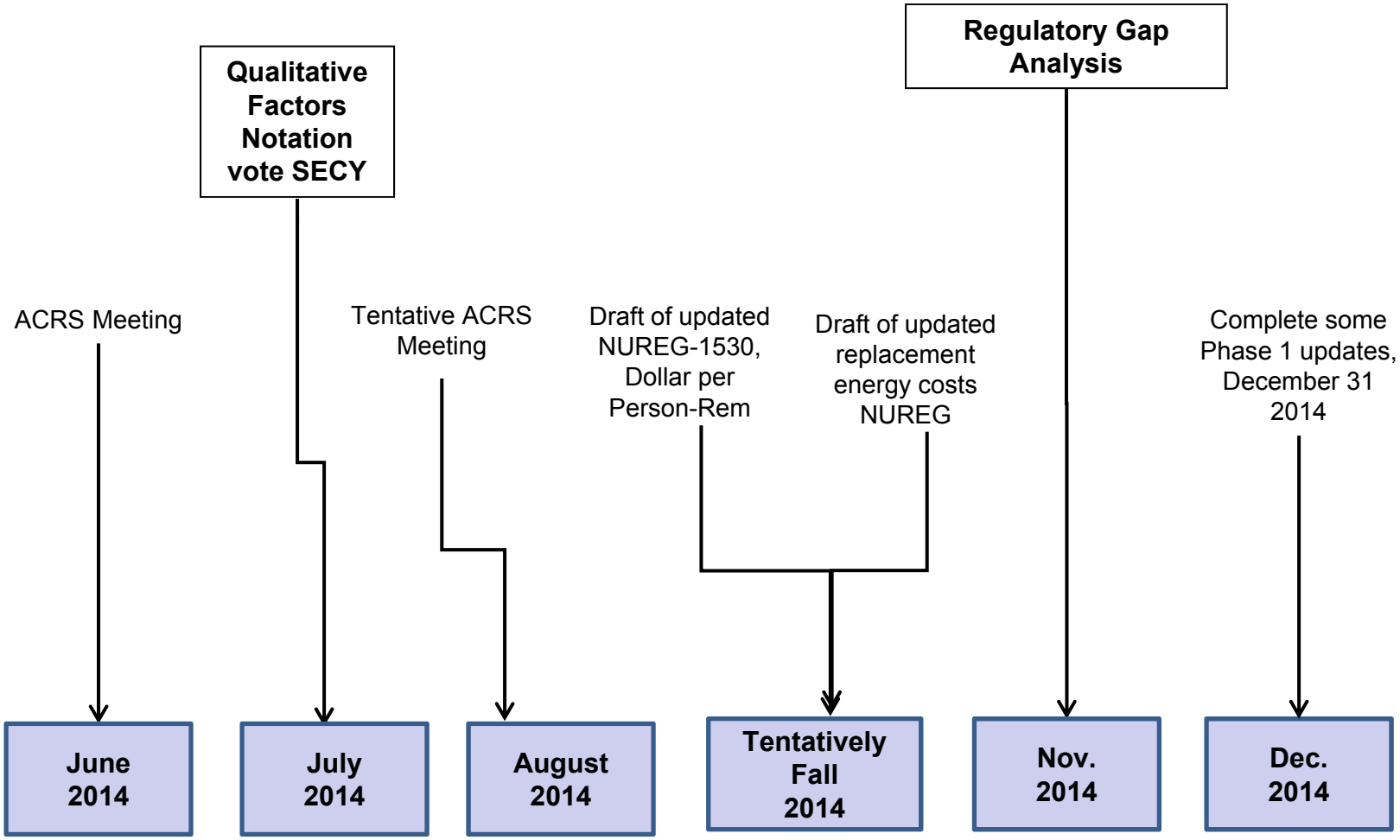
Timeline of 2014 Cost-Benefit Activities



Dates are estimates and subject to resources and Commission direction

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Price-Anderson Act (PAA)

- Commission required to submit a report to Congress by December 31, 2021 on need for continuation or modification to the PAA
- Staff has not historically used cost-benefit analyses as means to inform the Commission's report to Congress
- Enclosure 4 to SECY-14-0002 provides more information

Regulatory Analysis Overview

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Regulatory Analysis Definition

- A formal, highly-structured, reasoned analysis of a proposed government agency requirement containing estimates of benefits and costs that are quantified to the fullest extent possible

- Societal cost-benefit analysis

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What is Regulatory Analysis

An analytical tool provided to decision makers that:

- Recommends a preferred alternative from the potential courses of action studied
- Contains estimates of societal benefits and costs with a conclusion whether the proposed regulatory action is cost beneficial
- Documents the analysis in an organized and understandable format

Examples of Regulatory Actions

Regulatory Analyses are performed for:

- Rules
- Bulletins
- Generic Letters
- Regulatory Guides
- Orders
- Standard Review Plans
- Standard Technical Specifications
- Branch Technical Positions

Regulatory Analyses are <u>not</u> performed for:

- Licensing Actions
- Topical Reports
- Regulatory Issue Summaries
- Information Notices
- Policy Statements
- Inspection Reports
- Generic Letters (transmittal of information)

Purpose of a Regulatory Analysis

- Decision tool for policymakers
- Rationale for action
- Transparency of Agency decision making
- Consistency with Executive Orders on regulatory analysis and related issues
- Comply with Office of Management and Budget guidance and Executive Orders

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Regulatory Analysis is Required when a Proposed Action:

- Establishes or communicates requirements, guidance, requests, or staff positions that would result in a change in licensee resources
- Involves backfitting licensed facilities
- Imposes generic requirements on one or more classes of the agency's reactor and materials licensees

NRC Regulatory Analysis Requirements

- No statute, NRC regulation, or Executive Order requires the NRC to perform regulatory analysis
- Voluntarily performed since 1976

Format and content of an NRC Regulatory Analysis

1. Statement of the problem and objective
2. Identification of alternatives
3. Safety goal evaluation*
4. Estimation and evaluation of costs and benefits
5. Presentation of results
6. Decision rationale
7. Implementation

* This is unique to the NRC and not included for other agencies

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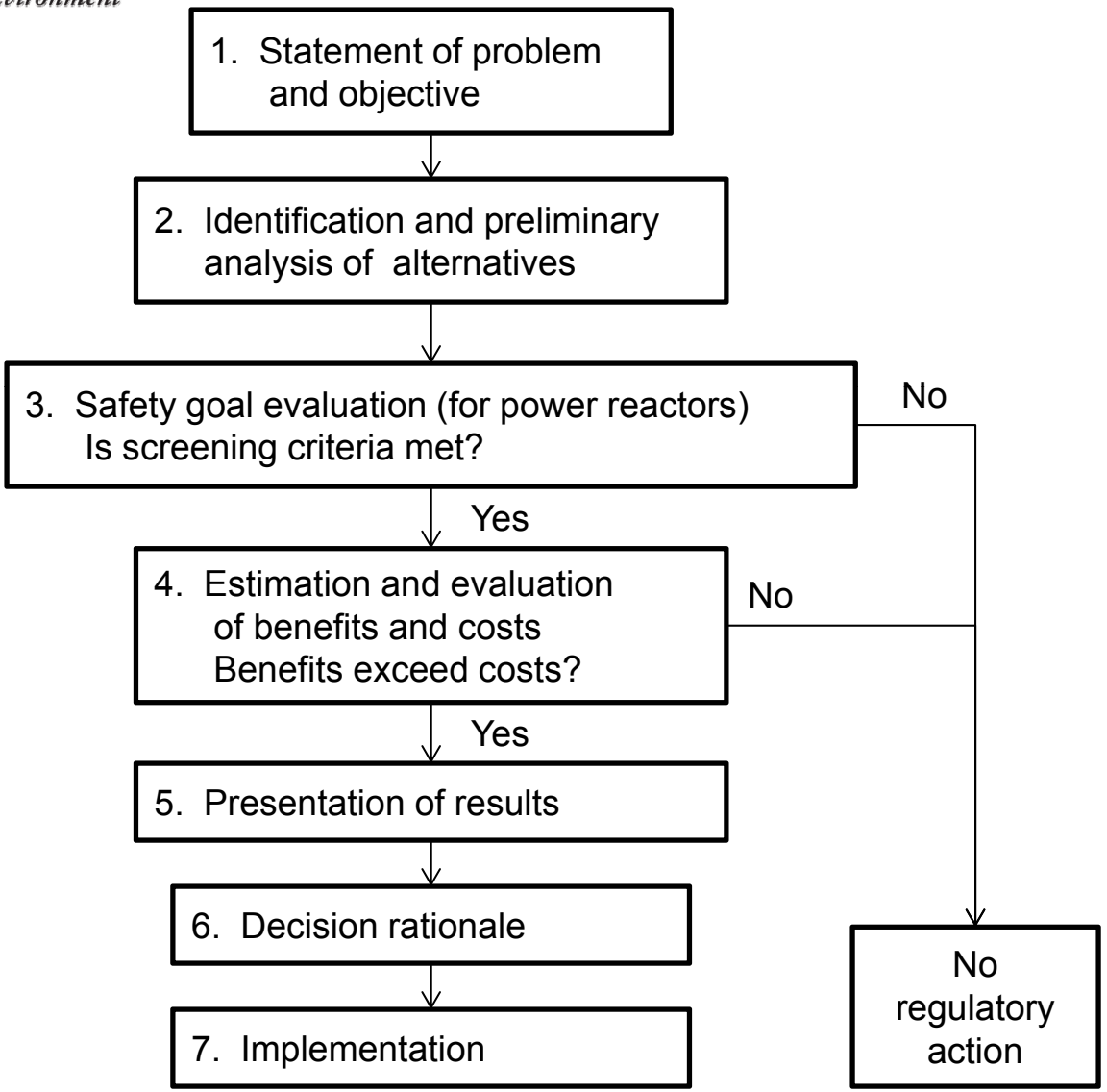
Regulatory Analysis Steps



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Safety Goal Evaluation (for nuclear power reactors)

- Determines whether the proposed requirement constitutes a substantial improvement in public health and safety
  - Change in core damage frequency per reactor-year
  - Conditional containment failure probability
- Applies to generic preventive safety enhancements involving nuclear power plants
- Risks from the nuclear fuel cycle and possible effects of sabotage or diversion of nuclear material are not included in the safety goals

Safety Goal Evaluation (cont'd)

Safety Goal Screening Criteria

Estimated Conditional Containment Failure Probability[3]	1E-02	1E-01
1E-03 to 1E-04	Proceed to benefit-cost portion of regulatory analysis	Proceed to benefit-cost portion of regulatory analysis[1] (Priority)
1E-04 to 1E-05	Management decision whether to proceed with benefit-cost portion of regulatory analysis	Proceed to benefit-cost portion of regulatory analysis
1E-05 to 1E-06	No action taken[2]	Management decision whether to proceed with benefit-cost portion of regulatory analysis

1 A determination is needed regarding adequate protection or compliance; as a result a benefit-cost analysis may not be appropriate.

2 Unless office director decides that the screening criteria do not apply.

3 Conditional upon core damage accident that releases radionuclides into the containment

Attributes Considered in a Regulatory Analysis

- Public Health (Accident)
- Public Health (Routine)
- Occupational Health (Accident)
- Occupational Health (Routine)
- Offsite Property
- Onsite Property
- Industry Implementation
- Industry Operation
- NRC Implementation
- NRC Operation
- Other Government
- General Population
- Improvements in Knowledge
- Regulatory Efficiency
- Antitrust Considerations
- Safeguards and Security Considerations
- Environmental Considerations
- Other Considerations

Estimation of Costs and Benefits

To the extent applicable, attributes to be assessed include the following:

Cost estimates:

- costs to licensees
- costs to the NRC
- costs to State, local, or tribal governments
- adverse effects on health, safety, or the natural environment
- adverse effects on regulatory efficiency or scientific knowledge needed for regulatory purposes
- adverse effects on the efficient functioning of the economy and private markets

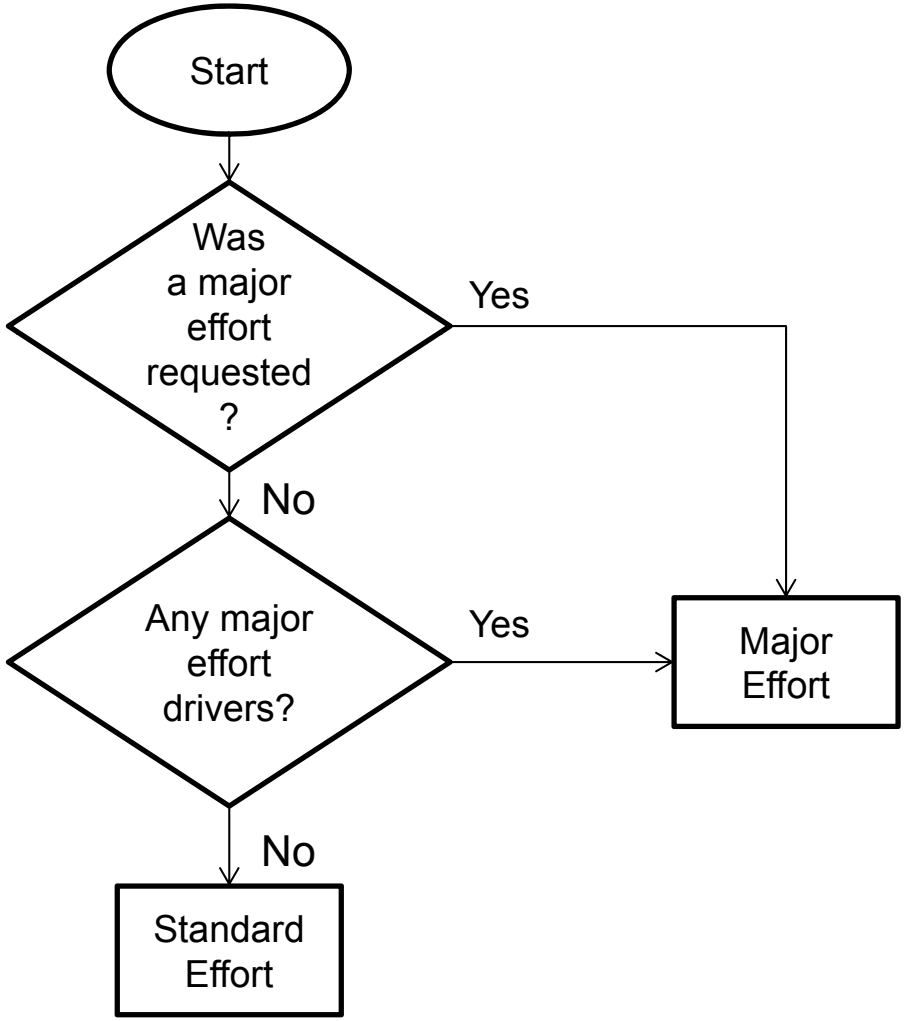
Benefit estimates:

- reductions in public and occupational radiation exposure
- enhancements to health, safety, or the natural environment
- averted onsite impacts
- averted offsite property damage
- savings to licensees
- savings to the NRC
- savings to State, local, or tribal governments
- improved plant availability
- promotion of the efficient functioning of the economy
- reductions in safeguards risks

Regulatory Analysis Level of Effort

Major effort drivers

- Annual effect on economy of $100 million or more
- Major increase in costs or prices for consumers; individual industries; federal, state or government agencies or geographic regions
- Significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S.-based enterprises to compete with foreign-based enterprises in domestic or export markets
- Roughly comparable benefits and costs
- Potential for considerable controversy, complexity, or policy significance



Regulatory Analysis Considerations

1. Choose time horizon appropriate for analysis based on when costs and benefits are incurred
2. Consider each group affected by the regulatory action
3. Identify elements that may be difficult to quantify or monetize
   - Develop strategy on how to estimate these costs or benefits
   - Establish depth and breadth of the uncertainty analysis
4. Search for good data
5. Estimate costs and benefits by year for the entire period that groups will be affected by the proposed regulatory action
6. Convert estimated costs and benefits to monetary terms expressed on a present-worth basis using both 3-percent and 7-percent real discount rates

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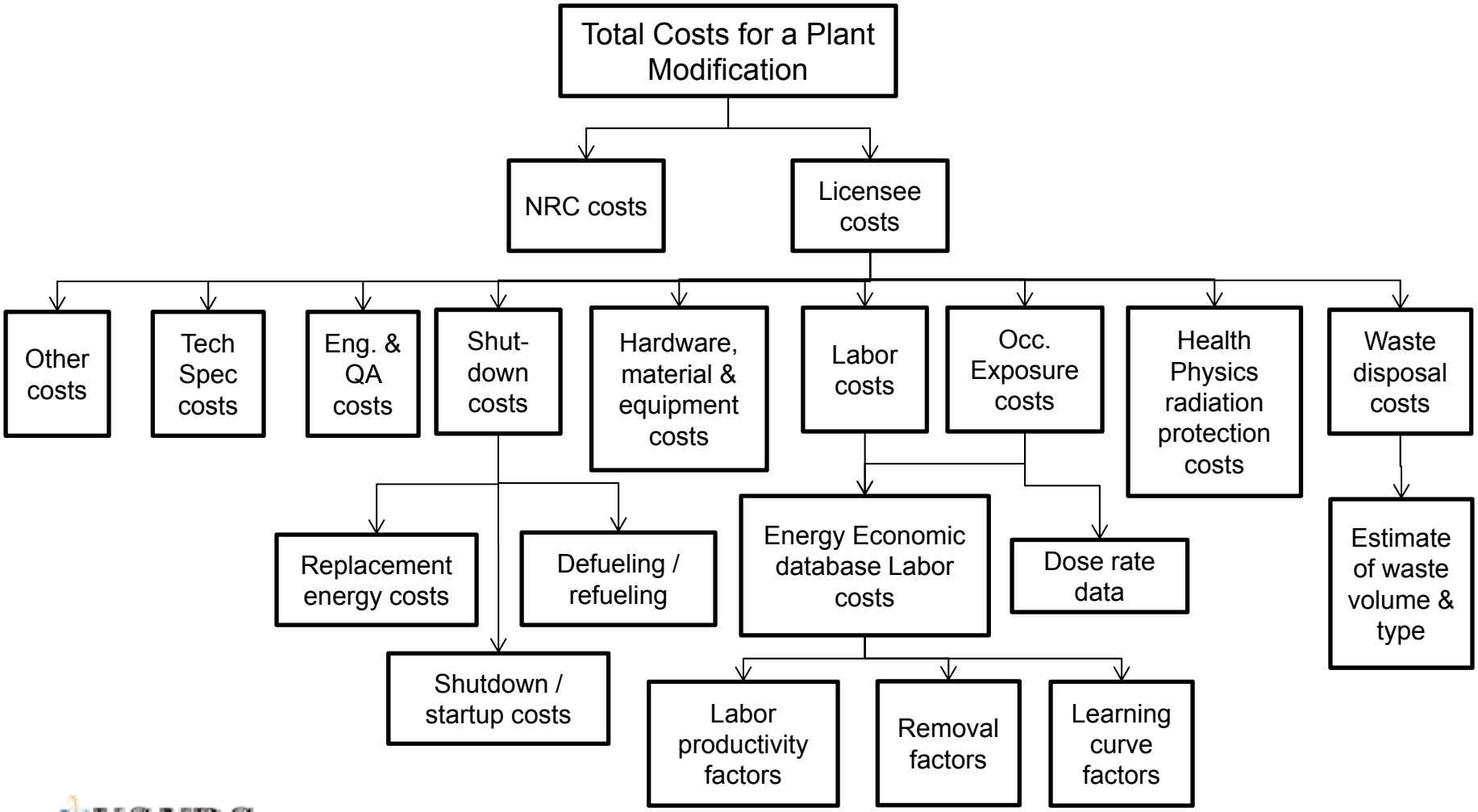
Estimating Costs associated with a Plant Modification



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NRC Guidance on Uncertainty

- Use common sense
- Detail and breadth should be commensurate with the overall policy significance, complexity, level of controversy, and perceived importance of the recommendation
- Use and discuss the best available peer-reviewed studies and data collected by best available methods
- Use and discuss qualitative factors (i.e., increased confidence in the margin of safety), when appropriate

Difference between Uncertainty and Sensitivity Analysis

Uncertainty Analyses:

- Evaluates and quantifies the change in model predictions so that it can be considered when using model predictions for decisionmaking
- More formal than sensitivity analysis
- Explicitly quantifies uncertainties and their relative magnitudes but requires probability distributions for each random variable

Sensitivity Analyses:

- The process of varying model input parameters over a reasonable range and observing the relative change in model response
- Manipulate one parameter at a time unless multiple parameters are affected when one is changed

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Presentation of Results

- Net benefit value
- Supplementary considerations (nonmonetary and nonquantified attributes)
- Uncertainty analysis and/or sensitivity analysis results
- Safety goal evaluation, if applicable

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Decision Rationale

- Alternative with greatest net benefit value
- Other contributors to decision rationale may include:
  - Attributes quantified in nonmonetary terms or nonquantifiable considerations
  - Relationship to legislative mandates
- Recommendation is not binding

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Implementation

- Identify how and when the proposed action is to be implemented
  - Identify proposed NRC regulatory instrument (e.g., rule, regulatory guide, generic letter)
  - Identify dates with realistic schedule

Backfit Analysis (10 CFR 50.109)

- Backfit – A change in agency position
- Backfit Rule – Sets the standard for changing the requirements
- Backfit Analysis – Required for all backfits
  - Does an exemption apply (e.g., adequate protection)
  - Assists in determining if the backfit represents a substantial increase in protection of the public health and safety and common defense and security
  - Aids in demonstrating that the costs of the backfit are justified in light of the action's increased protection

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Comparison of Regulatory Analysis with Backfit Analysis

Backfitting and Issue Finality	Regulatory Analysis
NRC-unique policy, voluntarily adopted	Federal agency-wide policy
Protects licensees and other entities who have received or wish to reference certain NRC regulatory approvals (e.g., design certification rules)	Protects society from bad governmental decisions
Applicable only to regulatory proposals affecting current licensees and regulatory approvals	Applicable to all regulatory approvals affecting both current and future licensees and regulatory approvals
Substantial increase which outweighs the cost of the backfitting	Benefit equal to or greater than the cost of the regulatory action
Only health and safety or common defense and security benefits	All benefits, all costs

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Backup Slides

Basic Definitions

- Regulatory change – Any change in agency position requiring licensees to expend resources
- Baseline – Best assessment of the way the world would look absent the proposed regulatory change
  - Includes current statutes and regulations, even if not yet implemented
- Net Present Value (NPV) – Method of taking into account the time value of money and of comparing benefits to costs (or comparing different alternatives), which may not occur in the same timeframe

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Basic Definitions (continued)

- Discounting – Method of bringing costs and benefits occurring at different times to a common time period
  - Cost = $10 in Year 1, Benefit = $100 in Year 2
  - Discount rate is 7%
  - NPV of Cost in Year 0 = $10/(1+0.07)^1 = $9.3
  - NPV of Benefit in Year 0 = $100/(1+0.07)^2 = $87.3
  - Net Effect in Year 0 terms = $87.3 - $9.3 = $78
- Bundling – The aggregation of different requirements within a regulatory action that results in a particular requirement appearing to be cost-beneficial, when it isn't
  - If individual requirement is necessary, it doesn't need to be analyzed separately
  - If individual requirement is supportive but not necessary, it should be included only if it makes the bundled initiative more cost-beneficial
  - If individual requirement is unrelated, it should be included only if it makes the bundled initiative more cost-beneficial and it passes the backfit test

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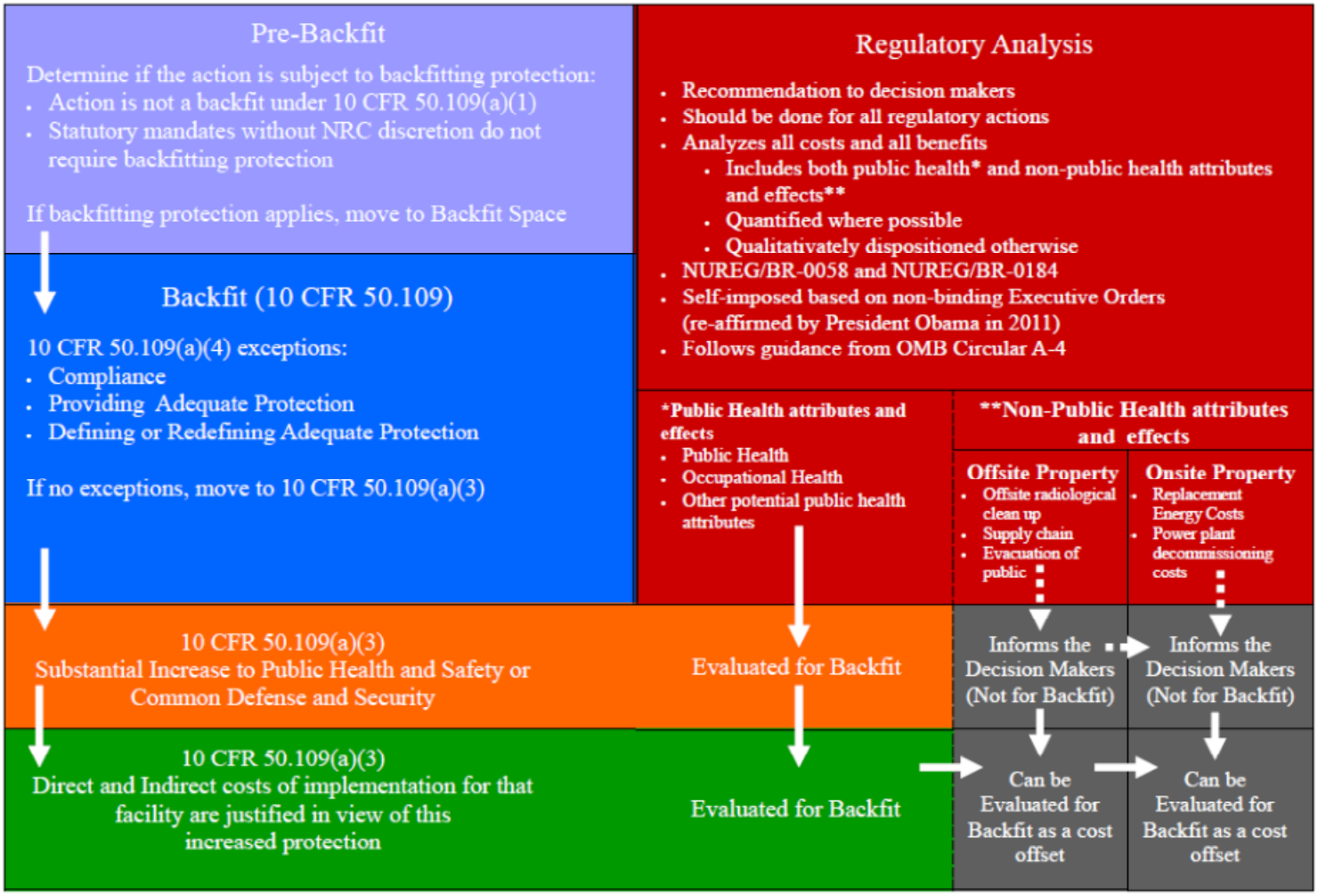
Regulatory Analysis vs. Backfit

REGULATORY ACTIONS (Operating Reactors)



Discussion of Qualitative Factors

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Background

- SRM-SECY-12-0157 directed the staff to “seek detailed Commission guidance regarding the use of qualitative factors [in regulatory analysis and backfit analysis] in a future notation voting paper”

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Background (cont'd)

- Qualitative factors are used in regulatory analysis and backfit analysis
  - NUREG/BR-0058, Revision 4, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission", page 24
  - SECY-77-388A, "Value-Impact Guidelines" instructed to consider quantitative and qualitative factors
  - SRM-SECY-93-086 allowed for use of qualitative factors for backfit analysis within the "substantial increase" criterion

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Background (cont'd)

- Documents that require or recommend the use of qualitative factors by other federal agencies
  - Executive Order (EO) 12866, "Regulatory Planning and Review"
  - Office of Management and Budget (OMB) Circular A-4, "Regulatory Guidance"
  - Office of Information and Regulatory Affairs (OIRA), "Regulatory Impact Analysis: A Primer"

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Background (cont'd)

- Use of qualitative factors in risk-informed decisions
- Safety Goal Policy Statement
- Probabilistic Risk Assessment Policy Statement (e.g., Regulatory Guide 1.174)

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Background (cont'd)

- Qualitative factors are considered in adequate protection decisions
  - Only quantitative safety goal measure is the Quantitative Health Objectives (QHOs)
    - Applicable to power reactors only
  - Other adequate protection decisions are made based on a qualitative determination

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Background (cont'd)

- Qualitative factors are used in cost-justified substantial safety enhancement decisions
  - NUREG-1409, "Backfitting," allows for the use of qualitative factors
  - SRM-SECY-93-086 also allows for the use of qualitative factors

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Discussion

- Multiple cases where qualitative factors can be considered within a cost-benefit analysis for a regulatory analysis and backfit analysis
- Case 1:
  - Benefits are difficult to quantify and, thus, are only presented qualitatively
  - Costs are quantified

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Discussion (cont'd)

- Case 2:
  - Some benefits are quantified, but not all
  - Costs are quantified
- Scenario A:
  - Quantitative analysis results are cost-beneficial
  - Qualitative factors strengthen the staff's recommendation

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Discussion (cont'd)

- Scenario B:
  - Quantitative analysis results are not cost-beneficial
  - Qualitative factors are used to support the staff's recommendation
- Scenario C:
  - Identification of relevant qualitative factors
  - No consideration of qualitative factors into the staff's recommendation

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Discussion (cont'd)

- Different evaluation techniques for evaluating qualitative benefits and costs
  - Cost-effectiveness analysis
  - Break-even analysis
  - Internal rate of return
  - Qualitative assessment supplemented with decision analysis tools

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References

- EO 12886, 58 FR 51735 (October 4, 1993) and http://www.whitehouse.gov/omb/inforeg_riaguide/
- NEI Letter (ML14028A455)
- NRC policy statements available at http://www.nrc.gov/reading-rm/doc-collections/commission/policy/
- NUREG/BR-0184 available at ML111290858
- NUREG/BR-0058 available at ML042820192

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- NUREG-1409 available at ML032230247
- NUREG-1530 available at ML063470485
- OMB Circular A-4, available at ML11231A834
- OIRA Regulatory Analysis Primer, http://www.whitehouse.gov/sites/default/files/omb/inforeg/regpol/circular-a-4_regulatory-impact-analysis-a-primer.pdf
- Regulatory Guide 1.174 available at ML003740133

References (cont'd)

- SECYs available at http://www.nrc.gov/reading-rm/doc-collections/commission/ or in ADAMS
- SECY-12-0110 available at ML12173A478
- SECY-12-0157 available at ML12345A030
- SRM-SECY-12-0110 available at ML13079A055
- SRM-SECY-12-0157 available at ML13078A017
- SRM-SECY-13-0132 available at ML14139A104