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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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FUKUSHIMA SUBCOMMITTEE

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THURSDAY

MAY 23, 2013

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear Regulatory Commission, Two White Flint North, Room T-2B1, 11545 Rockville Pike, at 8:29 a.m., Stephen P. Schultz, Chairman, presiding.

SUBCOMMITTEE MEMBERS:

STEPHEN P. SCHULTZ, CHAIRMAN

J. SAM ARMIJO, Member

DENNIS C. BLEY, Member

CHARLES H. BROWN, JR., Member

MICHAEL L. CORRADINI, Member*

JOY REMPE, Member

MICHAEL T. RYAN, Member

SUBCOMMITTEE MEMBERS (Continued):

WILLIAM J. SHACK, Member

GORDON R. SKILLMAN, Member

JOHN W. STETKAR, Member

NRC STAFF PRESENT:

HOSSEIN NOURBAKHSH, Designated Federal Official

ALSO PRESENT:

BIFF BRADLEY, NEI

*Participating via telephone

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

(8:29 a.m.)

CHAIRMAN SCHULTZ: Good morning. This meeting will now come to order.

This is a meeting of the Advisory Committee on Reactor Safeguards, Subcommittee on Fukushima.

I am Stephen Schultz, Chairman of the Subcommittee. Members in attendance today are Dick Skillman, Dennis Bley, Sam Armijo, John Stetkar, Mike Ryan, Bill Shack, Charlie Brown, Joy Rempe, and Mike Corradini is on the phone line.

The purpose of today's meeting is to review and discuss the NRC Staff's development of a notation vote paper with possible options for addressing the Near-Term Task Force Recommendation 1, which is establishing a logical, systematic and coherent regulatory framework for adequate protection that appropriately balances defense in depth and risk considerations. This paper is due to the Commission in the beginning of December 2013.

So far the Subcommittee has held two meetings on this subject: on August 15th, 2012, and December 4th, 2012. In addition to today's briefing, we've scheduled two more Subcommittee meetings in

September and October, prior to a full Committee meeting in November, where the ACRS plans to write a letter to the Commission.

This entire meeting is open to the public. Rules for the conduct of and participation in the meeting have been published in the *Federal Register* as part of the notice for this meeting. The Subcommittee intends to gather information, analyze relevant issues and facts, and formulate proposed positions and actions as appropriate for deliberation by the full Committee.

Hossein Nourbakhsh is the Designated Federal Official for this meeting.

A transcript of this meeting is being kept and will be made available, as stated in the *Federal Register* notice.

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

We have received on written comments. We do have a request for time to make an oral statement from a member of the public following today's meeting or as a part of today's meeting in public comment period. I understand that there also may be other

stakeholders on the Bridge Line who are participating in today's proceedings via phone line. We will maintain that line on mute during the presentations to avoid background noise.

We will have an opportunity for the public comments, as I mentioned, at the end of the meeting, and at that point we'll open the Bridge Line to hear the public comments near the close of today's meeting

The focus points for today's discussion are establishing a design extension category of events and associated regulatory requirements; establishing commissioned expectations for defense in depth and clarifying the role of voluntary industry initiatives in the NRC regulatory process.

Today we also have the benefit of hearing a progress report from the staff and also a presentation by Biff Bradley from the Nuclear Energy Institute regarding NEI's perspectives on these topics.

We'll now proceed with today's meeting, and I call upon Mr. Michael Johnson, Deputy Executive Director for Reactor and Preparedness Programs, to open the presentation.

Michael.

MR. JOHNSON: Thank you. Good morning.

I wanted to just spend a few minutes at the start of the meeting, first of all, to thank you in advance for the work that you're doing to help us move forward on Recommendation 1, and I wanted to come in person because, first of all, it has been far too long since I sat on this side of the table at an ACRS meeting, Subcommittee or Committee meeting.

it has been a long time, and I look back. I want to say I look back with fond memories.

(Laughter.)

MR. JOHNSON: But I won't go quite that far, but it is good to be here.

But I also am here because I wanted to put an emphasis on the importance of this particular task to the Staff. Of course, as you well know, based on your involvement to date with Fukushima items, there are five basic areas of those recommendations, three of which dealt with enhancing protection, enhancing mitigation, enhancing emergency preparedness based on the lessons that we learned from Fukushima.

But the other two, one which dealt with the Staff looking at our internal processes and the other, Recommendation 1, we broke out and were working in parallel some would say on a slower track, if you will, recognizing the urgency of the three items that

I talked about that you're well familiar with.

The fact though that Recommendation 1 was broken out and worked on a slower track I don't think in any way should mean to anyone that we see that recommendation being of less potential value than the other recommendations going forward, and I was fortunate enough to sit in on a forum conducted by NRO, the Office of New Reactors, not too long ago, and it was on 50 years of licensing experience, and we brought in folks like Tom Murley and the NRC Historian and other folks to talk about lessons that we learned in licensing over the last 50 years.

And one of the folks, the historian, Tom Wellock, talked about the fact that following Three Mile Island, in fact, in that 18 to 24-month period following Three Mile Island when we were trying to figure out whether or not we would continue to license or how we would continue to license the NPOLs, for example, and we were very much introspective about learning lessons from Three Mile Island and making sure that the fleet was safe.

At that very time, there was a group that was stood up chartered by Steve Crockett, who some of you may know, Jerry Wilson, who a number of you probably remember, to do work on Part 52, to build the

licensing -- the rule Part 52 -- and to set in place the framework that really became a final rule in the late '80s and then is the rule that we use to support reactor licensing, combined licenses and so on and so forth.

So even at the time, even within days or months or a few months of Three Mile Island we were looking forward with respect to what we ought to do with the framework, and I really see Recommendation 1 as having that same sort of perspective for the Staff today, recognizing that we need to do things urgently with respect to, for example, mitigating strategies. We know that's work that has to happen, but we also want to make sure that we take a look at the framework, and that's what the work on Recommendation 1 represents.

So we recognize that some will say that we ought to really focus on things that will bring us the most immediate safety benefit, if you will. We would agree with that, but we also think that in parallel with those activities we ought to be doing work on Recommendation 1.

Of course, the group that will be presenting today has done a lot of work, a lot of thinking on Recommendation 1, and has had substantial

interactions with external stakeholders on Recommendation 1. We, in fact, as recently as December of last year, I know, met with this Subcommittee in terms of our thinking in the December time frame.

In January we got together; the Fukushima Steering Committee got together. We looked at what was coming out of that work. We wanted to look at those recommendations as a Steering Committee. We did some repackaging, if you will. We wanted to try to organize it in a slightly different way perhaps, provide a little more clarity regarding where we were going on some of those recommendations so the Commission could have a clear option to pick at the end.

And that caused us to revise the schedule and to ask for additional time, and the Commission granted that. And we recognize also though that you have reordered your schedule to support interactions that you talked about, Steve, in terms of the opening interactions in September and October and a letter in November. We see that as really being important to enabling us to move forward to provide the Commission a well rounded recommendation regarding what we might do to the framework based on what we've learned as a

result of the lessons of Fukushima.

So I guess I'll stop with just a thank you in advance for your continued focus in all of the areas, but of course, your continued focus on Recommendation 1. We really value your perspective, and I know the Commission values your perspectives with respect to the recommendations that the Staff will be offering up.

So thank you.

CHAIRMAN SCHULTZ: Thank you.

MR. JOHNSON: With that I'll turn to Dick.

CHAIRMAN SCHULTZ: Okay.

MR. DUDLEY: I'm Dick Dudley. I'm the Project Manager, the Rulemaking Project Manager for Recommendation 1.

On Slide 2.

This is just an overview of the presentations that the Staff will be making today. I'm giving right now a little overview of Recommendation 1 and review the action that we've taken and some of the actions that we plan.

Then I will also present Improvement Activity 1, establish a design basis extension category of events and associated requirements.

Mary Drouin will then present Improvement

Activity 2, to establish Commission expectations for defense in depth.

And then Dan Doyle will present the Improvement Activity 3, to clarify the use of voluntary initiatives.

On Slide 3.

When we met with the ACRS the first time in August of 2012, we described 12 potential framework improvement activities. When we met with you again in December, those improvement activities had evolved into four different options that we described in a November 2nd white paper.

And today those four options are condensed down into three improvement activities any of which the Commission can decide to undertake or to not undertake.

These improvement activities were described in a February 2013 white paper, which was very broad and that we tried to describe all the different ways one could accomplish each of those improvement activities, but then on May 15th, we updated that white paper. This is our third white paper, and we presented the Working Group's recommended approach for each of the three improvement activities.

Slide 4.

NEI provided comments on our very broad white paper, our February white paper and April 30th, and as I said before, we presented our recommendations in a white paper on May 15th.

The day after that white paper, we opened a public comment period, and we're using the federal government rulemaking Website, regulations.gov, to have that comment period, and we'll close that comment period about 90 days later. So it's a substantial public comment period, and we're going to close it on August 15th.

The docket for that on regulations.gov is Docket NRC-2012-0173.

After the meeting today, we'll hold our third public meeting on June 5th, and then after all these interactions, we'll update our white paper again and issue a fourth white paper in august that addresses the comments from the ACRS, from external stakeholders, from internal stakeholders and, in particular, from the JLD Steering Committee.

We'll provide that fourth white paper to the ACRS to support the Subcommittee meeting on September 3rd.

On Slide 5.

And then we'll start to prepare the SECY paper, and as you can obviously see, the white paper is going to be a large part of what will be in the SECY paper. We'll provide a SECY paper to ACRS in mid-September to support the Subcommittee meeting in mid-October, and then we have the full Committee meeting on November 7th or 8th of this year.

We would like if at all possible to receive our ACRS letter within a week. I know that that's not the normal schedule, but if that's possible, it would help us out a great deal because we owe the SECY paper to the Commission on December 2nd, and after we get the ACRS comments, we have to evaluate them. We have to modify the SECY paper as appropriate, go through all the management approvals and reviews involved with that, and provide it to the Commission by December 2nd. So if we could get the letter in a week, that would help us out a good deal.

CHAIRMAN SCHULTZ: We'll work to achieve that. Thank you.

MR. DUDLEY: Thank you.

Okay. Well, that completes my introduction. If there are no questions on that, I'll just proceed to Improvement Activity 1.

CHAIRMAN SCHULTZ: Any questions on the

introduction?

(No response.)

CHAIRMAN SCHULTZ: Go ahead, Dick.

MR. DUDLEY: Thank you.

So I'm going to be on Slide 7 now.

Improvement Activity 1 is, again, to establish this design basis extension category of events and associated requirements. Both task forces, the Near-Term Task Force and the Risk Management Task Force recommended establishing such a category by issuing rulemaking to set it up. This new category for beyond design basis requirements.

The working group evaluated three different approaches to establish this new category, three approaches that we looked at in detail. Approach number one is a plant specific approach that would require licensees to prepare an updated PRA, a plant specific PRA, and then use that PRA to identify plant specific risk outliers that met threshold criteria that the NRC had established by rulemaking.

When the licensees identified risk outliers, they would have to mitigate them to reduce the risk associated with those outliers, again, consistent with whatever we would issue and the criteria we would establish in the rulemaking.

In addition, for that sort of an approach, we believe it would be acceptable for licensees who had these PRAs to also look at their deterministic design basis and potentially identify non-risk significant sequences or accidents with their PRA that they could propose and submit to the NRC for review and approval for possibly moving those sequences or accidents from the deterministic design basis into the design basis extension category, which would support reducing the mitigation requirements associated with those sequences because they were not that risk significant.

So that's approach number one. Approach number two is a plant specific approach that would not have a PRA. It's basically the same approach as approach number one, but instead of doing an updated PRA, one would establish expert panels who would look at -- I mean, every licensee has a PRA. They're all a different quality and have been updated at different times or have not been updated, but the expert panels would look at the existing PRA and other approach risk information, and the expert panels would try to identify risk outliers associated with this plant and even perhaps design basis accidents that have low risk significance. So that's approach number two.

Approach number three is the generic approach. It would not require a plant specific PRA because under approach number three the NRC would generically establish the requirements on its own that would populate the design extension category.

And so those are the three approaches that we looked at, and the working group recommends a modified reduced scope version of approach number three.

CHAIRMAN SCHULTZ: For our information, Dick, are you going to describe today the differences between what you described as plants have a PRA today, that approach, and what you're indicating in approach number one as a PRA that would be developed, a required PRA?

MR. DUDLEY: Well, I have some backups, and I can explain about approach number one and how we evaluated it and why we didn't recommend it.

CHAIRMAN SCHULTZ: Okay.

MR. DUDLEY: If that's --

CHAIRMAN SCHULTZ: When you get to it, that will be fine.

MR. DUDLEY: Okay. All right.

CHAIRMAN SCHULTZ: Thank you.

MR. DUDLEY: Fine. Thank you. Okay.

MEMBER SKILLMAN: Dick, before you go on.

MR. DUDLEY: Yes.

MEMBER SKILLMAN: Words matter, at least as they're recorded and read by the public and other professionals. You just said that we recommended kind of a reduced version, like it's Approach 3 Light, or something like that. And while perhaps you don't mean to communicate it, it sounds like the working group says, "Well, it's really too hard to do all of Approach 3. We'll just do something less."

Can you explain what you meant there, please?

MR. DUDLEY: Yes, but I think if we go through the presentation when I explain why we selected approach number three, I think I'll get to that in the future.

MEMBER SKILLMAN: Okay.

MR. DUDLEY: And if I don't, please ask your question again.

MEMBER SKILLMAN: Thank you.

MR. DUDLEY: Okay. All right. So we recommend a modified version of approach number three.

Now on Slide 8.

To develop a categorization approach, you have to do two things. You have to find a category,

and you have to identify the requirements that would go into the category.

On Slide 9.

The working group recommendation on how to do these two things is to define a generic design basis extension category. That's what we would call it, and we believe that can be done with internal staff guidance only, and we would populate this new design basis extension category in a forward fit manner only in that it would only apply to new issues or new information that arise in the future and would be associated with new rules that we would issue based on those issues or that information.

MEMBER STETKAR: Dick, I was going to wait until the end, but I can't. Why is this different from the current regulatory framework that is effectively event drive and reactionary?

MR. DUDLEY: It is not substantially different.

MEMBER STETKAR: Okay. Why is that then responsive to both NTTF Recommendation 1 and the Risk Management Task Force recommendations, which highlighted that event driven reactionary type of framework as the fundamental source of this notion of patchwork regulations?

Something happens and we react to it specification. The reactor trip breaker doesn't open so we have apps. Plants have common cause failures of diesel generators. So we have station blackout, and so forth and so forth, without having an integrated, forward looking sort of evaluation of things that can happen, not reacting to things that have happened in the past.

And Fukushima is another example. We're reacting to things that happened at Fukushima.

MR. DUDLEY: We agree that approach number one, which is the plant specific approach where licensees are required to perform new or upgraded PRAs, we agree that that would be the most well defined approach to proceed with.

MEMBER STETKAR: Okay.

MR. DUDLEY: It would increase safety. What we are proposing will not have a substantial increase, will not really increase safety. There may be some marginal improvement by having clearer regulations, but if you required a plant specific PRA for all the reactors in the operating fleet, you could increase safety.

What we were concerned with though was that we didn't know how much we could increase safety,

and to have those PRAs, it is very, very expensive, and so we just made a judgment that we didn't feel as a group that the increase in safety associated with that approach would be -- we weren't sure that it would be cost effective if you proceeded down that path.

The Commission would have to be in a position that they would issue a PRA rule, and I'm not -- Michael, did you want to comment on that?

I'm just not sure that they're in that position right now.

MEMBER STETKAR: It seems like we should possibly give them the option to see if they are.

MR. DUDLEY: Well, they can certainly direct us to implement Improvement Activity 1 in accordance with one of the other approaches. They can do that, and we'll make it clear in the SECY paper.

MEMBER STETKAR: In the final SECY paper, are you going to elaborate more on the approaches that you showed on that first slide?

MR. DUDLEY: Certainly more than on this.

MEMBER STETKAR: Well, but I mean the white paper really does.

MR. DUDLEY: We can do that. Okay? We can do that.

MEMBER ARMIJO: Dick, I don't understand your comment that the approach number three that you're recommending would not improve safety. Is it just simply --

MR. DUDLEY: No, I'm talking about the categorization approach only.

MEMBER ARMIJO: Oh.

MR. DUDLEY: The other two activities will, indeed, improve safety.

MEMBER ARMIJO: Okay, okay.

MR. DUDLEY: But for categorization only, we don't believe that this approach will have a significant increase in safety. It will increase coherency, logic, and efficiency of the rules that we would issue in this beyond design basis area.

MEMBER ARMIJO: Okay.

MR. DUDLEY: But we don't believe -- well, to some extent if you increase the clarity and efficiency of a rule, then there's maybe an arguable increase in safety, but it is not a substantial benefit of the approach we propose.

Our approach basically is to increase the coherency and the logic and the efficiency of rulemakings that we would undertake in this beyond design basis area.

MR. JOHNSON: And I love John's -- I'm sorry. Can I just? I love John's question, and I hope at the end we come back and maybe try to take it on holistically. We're going to be talking about -- we're talking about this in pieces, but it occurs to me at the end of the day -- in fact, I harken back to conversations that we had in the Steering Committee with the Recommendation Working Group about Gary tells the story that -- Holahan tells the story that before he came to the NRC, in fact, he was working on, was concerned about ATWS, was working on the need for an ATWS rulemaking ten years before the rule, five years before the ATWS was done at Davis Besse.

All right. So there is at the end of this, at the end of all of the things that we do with respect to the framework, I think we do need to harken back to the question about so are we, based on these changes, are we going to be able to be in a better place with respect to finding the next potential Fukushima before it happens and address it.

I think actually when you look at all of the things that we're proposing together holistically we get closer. When you look at defense in depth, for example, that makes us look through a different lens that I think puts on the table an opportunity for us

to advance issues that you wouldn't advance if you simply looked at, for example, the likelihood that you would have the initiator that would result.

So I think it's a great question. Maybe at the end if we come back, I'd love to know what --

MEMBER STETKAR: That's one of the reasons I decided to make this comment early, to kind of get the panel thinking a little bit in that direction.

MEMBER BLEY: I guess I'd like to expand on John's points and ask you as you go through if you can help me understand.

You know, the issue about the patchwork response is an important one, I think. We will always be reactive if something new and surprising occurs. There's no way around that, but when we react, we can either respond to that very narrow thing that happened and try to make sure that particular exact thing doesn't happen again, which is what we seem to do, or we can look more broadly and see that as a class, and make sure whatever we do is looking at the class and all the different things that can lead us to that class.

As you go through, maybe you can tell us what you're suggesting under your Option 3, how it addresses that issue.

MEMBER SHACK: Just to pile on a little bit in the forward fit here notion, I mean, we just went through a mitigating systems order that we decided was needed for adequate protection, and you know, we've suddenly -- now that's the last time we're ever going to have to do that and there's no way that we can't think ahead? We wait for the next set of events or we decide that we need this.

And it doesn't seem responsive to me to the NTTF's thing that we needed to take a deeper look at defense in depth. I mean, everything was sort of PRA. Now somehow your defense in depth seems somewhat bloodless compared to the NTTF's, which I thought made the case that you really need to consider defense in depth stronger, and here you're in a much more neutral kind of position that we're going to look at this again. We're going to define it again, but there's no real feeling that we haven't considered defense in depth adequately.

And as I say, we just now issued an order for a whole bunch of defense in depth measures as adequate protection, and we somehow seem to ignore that.

CHAIRMAN SCHULTZ: Defense in depth we ought to wait on.

MEMBER BROWN: I guess I didn't quite understand Bill's comment because I thought Activity 2 covered a reexamination of the defense in depth stuff, and you know, there were examples. There were, you know, principles that you elucidated which should be considered.

So I just thought after listening to the rest of this I would provide some like moderate, moderating different thought process. I wasn't necessarily for or against any one of these approaches. I was appreciative of your comments along the way in here that throwing away a framework which has been used for 40, 50-something years, where people are comfortable and familiar and understand it, for the normal flow of business is not necessarily a good idea.

And I didn't quite understand how you couldn't integrate some of these things that you talked about in Activity 1, Approach 1, 2 or 3, without disassembling your current methodology that you use.

I mean, agreed that it's reactive in some circumstance, but I don't know why a simpler thought process relative to what have we not thought about going forward in terms of big events that could hurt

us based on what we've seen and broaden the thought process a little bit within the existing framework on this activity 1.

So I'm a big fan of defense in depth as opposed to process in some other places in PRAs and things like that.

Anyway, that was just a slightly moderating comment on the overall thought process.

MR. JOHNSON: Thank you, Charlie.

Can I give you just a 50,000 foot level perspective and then these guys are going to tell you what the right answer is?

We struggled with -- we will struggle with laying out for the Commission however this looks a recommendation that causes them to decide whether this new framework -- you decide what it looks like -- gets applied retrospectively. We recognize that there are 100 or maybe 102, maybe five years from now 104 or five -- I don't know what the count is -- but we've got a bunch of plants that were licensed and are operating and we're overseeing based on an existing framework, and so the Commission is going to need to decide do you take that framework, that pristine framework or revised framework that you would want to have in place before you licensed any of those 104 or

whatever the count; do you apply that backwards looking or do you put it in place and then apply it to new things?

Not to say that you need to be reactive looking forward, to continually be reactive, but that you would make it looking into the future. So you would deal with new issues, new regulatory concerns. You would deal with new and significant information perhaps out of operating experience in a broad sense so that it's not just narrowly, but very broadly.

But that's the decision. Do you put it in place and then look forward in terms of its implementation, or do you put it in place and then also look backwards and make changes to existing plants perhaps based on what that revised framework would tell you?

That's a decision that we're going to need to lay out for the Commission because they'll have to make it. It will have costs and benefit considerations associated with it. At the end of the day I think the Commission has got to decide that as a policy matter.

What did I say wrong?

MR. DUDLEY: That's fine. That's fine.

CHAIRMAN SCHULTZ: Why don't you proceed,

Dick?

MR. DUDLEY: Okay. May I go to Slide 10 now?

The working group, you know, identified that NRC regulations already include a de facto design extension category. It would include the beyond design basis, the current beyond design basis regulations of station blackout ATWS; the 50.44 combustible gas requirements for severe accidents; 50.54(hh) on the loss of large areas due to fires and explosions.

We're also working on a number of other rules that are currently being looked at: 50.46(a), risk informed; ECCS; and the beyond transition break size LOCAs would appropriately fit in this category.

The risk informed GSI 191 Rule for long-term cooling, and I believe all of the Fukushima rules would fit in this category.

Essentially we already have the category. We don't need rulemaking to establish it. We can do it with internal Staff guidance.

Now on Slide 11.

All right. So what would we put in this internal staff guidance? Well, first, we would define design basis extension conditions, and these would

include both events and hazards. And then what we would do is we would specify how the Staff would write future requirements, both regulations and orders. This would apply to orders also, to ensure that they're consistent, coherent and complete.

The problem with beyond design basis regulations is a lot of the things you take for granted like quality assurance requirements, the 50.59 change process, training requirements, a lot of those things don't apply in the beyond design basis area. So what we think the guidance will do, it will allow the Staff to write better, more complete, more efficient, and more thorough rules and just do a better job of regulating in this area.

We believe that beyond design basis rules should include well defined performance goals. You'd have to specify analysis methods and acceptance criteria. You need to specify treatment requirements with respect to design criteria, availability, something, you know, in place of tech specs since tech specs do that for your design basis regulations; testing requirements, quality assurance, quality control, training.

And another thing in this internal guidance would be general guidance that would assist

the Staff in determining the appropriate treatment requirements for the regulations in this category. We don't believe that we could establish a single set of treatment requirements that would apply to all the rules that would go in this category. So what we're proposing is to develop guidance to assist the staff in selecting the appropriate set of treatment requirements for the specific regulation that they're working on.

So that's what we would do with treatment. You should also in each beyond design basis rule specify reporting requirements, including how you would update the FSAR because 50.59 talks about changes to the probability and consequences of accidents previously evaluated in the FSAR. If you issue a design basis extension rule and you make sure that it is valuated in the FSAR, then it's possible that the 50.59 change process would be applicable to that particular design basis extension rule. So that is something we should always look at.

If you can't make 50.59 work for the particular rule, the station blackout mitigating strategies rule is perhaps an example where it's not really an accident or an event. It's just a condition. Then each rule would have to specify it

sown change process to make sure that it was complete and thorough.

And we're also working with, like for the station blackout mitigating strategies rule, I'm working with Tim Reed, the Project Manager for that, and he's aware of our recommendations, and he's considering these things in that particular rulemaking.

On Slide 12.

MEMBER SKILLMAN: Before you go there, would you expand on your thoughts regarding FSAR operating, please, Richard?

MR. DUDLEY: Well, I don't have a lot of detail on that, but we would just need to make sure that the regulation said how the licensee would update their FSAR regarding whatever beyond design basis issue is being considered by that rule.

And then it would say also that 50.59 either was or was not applicable based on how the FSAR updated was specified by that rulemaking.

I don't know if that's answering your question, but --

MEMBER SKILLMAN: No, I'm pulling on a different thread. In the original NTTF report, the thought was that they have a category called extended

design basis requirements. Those were changed slightly, design basis extension conditions.

I'll take you back to ECCS hearings in the early '70s. When the NTTF report explains that the current framework has been effective, I agree with that. I was a participant many, many years ago when we had to come forward with our analyses of accidents and transients in our Chapters 15 or 16, or whoever they were in the old PSARs and FSARs, because you remember that tortuous process.

And the result of that robust interaction between the licensee, the NSSS vendor, and the NRC was a fairly high level of agreement how the plant would behave and what the outcome would be for a large break or small break or a steamline break or a reactivity, you know, rod ejection or whatever it might have been.

So in that third from the top bullet there, including FSAR updating, I'm wondering if what preserves the integrity of the process in the robustness of the product is an interactive process with the licensees where these items that are now considered beyond design basis get a complete and thorough analysis that the licensee and the NRC agree to, and it becomes documented as an addition to the FSAR.

So there's really no wiggle room in what equipment will be used, what the anticipated thermal hydraulic and reactivity behavior of the plant will be, where the EOPs fit to make sure that what is now the extended design basis gets fulfilled, and to the extent that that's important, that the quality classifications, the level of the hardware you're depending upon are actually delivered, whether that's commercial grade dedication or you've got to go out and buy new stuff.

So I'm suggesting that maybe this idea of FSAR updating might not be a target as big as an airplane hangar that you really needed to look at. It's big, and if the extended design basis phenomena that are going to be required are not fully analyzed, at least I for one would say we've only delivered half a loaf. There's a whole lot more that needs to be done.

Those who are going to say, hey, we've moved into a new area for design basis extension have proven through our analysis and our interactions that we can do this, that we can cool the core, maintain the clad, and maintain the containment area.

So it seems that hiding in FSAR updating is a very large piece that probably needs some stern

consideration.

MR. DUDLEY: So your comment is basically FSAR updating is not a trivial thing. You need to make sure it's very broad and it addresses all aspects of the criteria that I've specified on this slide.

MEMBER SKILLMAN: Yeah, and I'm going back to the ECCS hearings and some of the TMI 2 stuff where after those events we said, "By golly, we're weak. We had better shore this up by doing all of these other things," which we did.

I mean, I think the licensing basis of a lot of our current facilities for some of these beyond design basis regulations that we've written is probably buried in safety evaluation reports on the docket of the facility. I'm not sure of the degree and accuracy with which the FSAR is updated for all those things, and what I'm saying is that we need to know that, and one of the things we would do when we move forward with the new rules in this design extension category is make sure that all of this information on this slide here is incorporated and, I guess, included in the FSAR or some relationship that's linked to the FSAR.

MR. DUDLEY: I would agree with that. That's exactly what I'm saying.

MEMBER SKILLMAN: Thank you.

CHAIRMAN SCHULTZ: Dick, in terms of the magnitude of what that would perhaps set out to do, you mentioned earlier that we're talking about future rules and approaches, but then as you described the design basis extension categories, you indicated, well, there are many things that would fit in that category based upon what we have already done.

So one needs to identify carefully if you're setting out to do these elements of performance goals, treatment requirements, reporting requirements, and so forth, that we have to answer that question. Are we, in fact, establishing something that's only for future or are we going to be tempted to incorporate these expectations or all of those other things that are somewhat in place with respect to the category?

MR. DUDLEY: The existing rules -- I'll get ahead of myself a little bit -- but, you know, we will recommend putting the existing beyond design basis rules into this new category unchanged. Okay? That we believe is the most efficient way to do it. You won't have a bunch of backfit issues associated with each licensee's design basis.

And what we would do then is to the extent

that we need to change any of those rules, say, 50.44, say, Recommendation 6, I believe it is, on hydrogen, say that requires us to change our hydrogen requirements. Well, that rulemaking will be a design basis extension category rulemaking, and we'll undertake it, and we'll meet all of the criteria on this slide.

So we would address, we would grandfather these existing beyond design basis rules, and to the extent that they needed to be modified in the future, we would bring them into full, you know, compliance with the criteria and the goals in the Staff guidance that we would implement, but only on a forward fit basis.

So some of these things you're going to see rulemaking again, and that rulemaking will be subject to this category and to all of these criteria.

MR. JOHNSON: So a perfect example of that is the station blackout mitigating strategies rulemaking. So there's an order based on that Near-Term Task Force recommendation that deals with making sure that plants are able to maintain and store, you know, whatever.

And we had to make decisions. I mean, it's clearly beyond design basis. It's clear, as Dick

said, it's in that other category. We had to make decisions about all the things that are on this slide as it related to that new requirement. We did it. We, the Staff, proposed; the Standards Committee decided to propose to the Commission; the Commission approved.

The guidance that we want licensees to apply in order to come back with integrated plans, they submitted integrated plans on how they're going to achieve those requirements in accordance with the internal -- the interim Staff guidance that we issued. We're going to write safety evaluations on those plans where we approve the mitigating strategies the licensees are proposing to implement.

So that is, in fact, a part of their licensing basis captured in their FSAR to some extent, certainly captured in our safety evaluations, and we'll oversee that.

We made it up. We made it up for that one. We made it up. It turns out, I think, the Near-Term Task Force report would say we made it up every time.

What this is trying to do is establish a framework or establish the process by which we don't make it up case by case. We apply that same

consideration with respect to what we'll accept in terms of analysis methods and acceptance criteria and those kinds of things.

So it really is, as Dick started, the point you started with, intended to make us more consistent, efficient. It's not going to change. I mean, I think this notion about updating the FSAR really is we're going to be specific about how that happens or requirements, new requirements, that fall in this category.

So I don't know if that helps. Just a different way of thinking about it, I guess.

CHAIRMAN SCHULTZ: All right. Thank you.

MR. DUDLEY: On Slide 12 now.

We would recommend -- well, what are the criteria for including a regulation in this category? Well, we recommend putting both adequate protection and safety enhancement rules into the same category. The existence in the new design basis extension category wouldn't change in any way the Commission's discretion and the criteria that they use to determine adequate protection.

Likewise the safety enhancement regulations that would be added to this category, we recommend continuing to use the existing criteria and

the Regulatory Analysis Guidelines.

The purpose of this graphic is just to kind of illustrate the criteria in the Regulatory Analysis Guidelines that determine when the design extension requirements -- when a rulemaking would be undertaken and when it would be appropriate, based on risk and other things, to not have any regulatory requirements associated with an accident or a condition.

The break analysis guidelines depend on the change in CDF associated with the event or the accident, and they're also related to the conditional containment failure probability. So that is some aspect of the defense in depth associated with that.

But to integrate Improvement Activity 2 into this concept, we envision the possibility -- and please correct me if I get out of whack here -- but we envision the possibility that the defense in depth activity could also be brought into the reg. analysis guidelines as an additional criterion, and that would fit into the design extension category that we're proposing.

But by doing that, we could, indeed, increase the safety of facilities by bringing in better defense in depth criteria in addition to the

criteria that are currently in the reg. analysis guidelines.

MEMBER STETKAR: Dick.

MR. DUDLEY: Yes.

MEMBER STETKAR: I'm always intrigued when I see those numbers on the bottom there, delta CDF and CCFP and all of those sorts of things because I usually think they come out of risk assessments. How is the Staff going to make those determinations now on a generic basis because you're proposing this on a generic basis?

MR. DUDLEY: Well --

MEMBER STETKAR: Are you going to use the SPAR models?

MR. DUDLEY: The way we do rulemaking now --

MEMBER STETKAR: Yeah, and completely. Are you going to use the SPAR models going forward? SPAR models are not complete. They're not consistent. They don't address by and large Level 2. They don't or very few of them address fires, flooding, seismic, shutdown and low power conditions. So are you proposing to, when you implement this, are you proposing to have a full scope, all hazards, all operating mode SPAR model for every plant in the

country so you can use those models on a generic basis now to determine fleet-wide generically whether a particular concern fits into, you know, which side of these dotted lines they fit?

Because that certainly is going to cost the taxpayers quite a bit of money to enhance those SPAR models to achieve that degree of sophistication, and if you use the current ones, in many cases the vent responses, the analysts will look at a SPAR model and say, "Well, gee, the SPAR model really doesn't do this, but if I make some assumptions and I look at the Surry or Peach Bottom PRAs, I will draw a conclusion," which is not necessarily very holistic going forward.

MR. DUDLEY: I'm going to ask for some help here, some of our PRA experts to do that.

MR. DINSMORE: This is Steve Dinsmore in the PRA Licensing Branch.

I don't think you're going to like this answer that much, but --

(Laughter.)

MEMBER STETKAR: At least we'll have something on the record though.

MR. DINSMORE: We already have a process to do all of these things. Every time we did a rulemaking, we calculate a change in CDF and learn,

and we do cost-benefit analysis. So there are processes in place, and I don't think they use the SPAR models. That would be more of a plant specific type, the first one of Dick's things.

So this is kind of continue to use the processes that we have in place to do these evaluations. So we already do them, and we would just continue to do them the way we have been. I don't --

MEMBER BLEY: I guess that's a little vague. How do you do them without a PRA when you're using PRA measures to define these things?

MR. DINSMORE: I've never done one of these analyses. So I'm not going to be able to answer that specifically, but they do generate some change in off-site dose associated with the proposed new rule or the proposed backfit. How they get that change in off-site dose, they do kind of generic analyses and if it affects LOCAs, they look at the dose that you get from LOCAs and how it can be improved, and then they turn that dose into a cost.

MEMBER BLEY: That kind of sounds like what Mr. Stetkar said. You take, you know, Surry or Peach Bottom or something and use it as a surrogate for some generic view of this thing. Is that what we're talking about?

MR. JOHNSON: I'm looking around, and I don't see any of the rulemaking, regulatory analyses folks in the room, and I don't want you to leave with the impression that we don't know how to do it. It's just that we don't have the folks here to tell you how we do it.

You certainly know that we consider in terms of the attributes that we look at, in computing the regulatory analysis, we look at the likelihood. So risk enters into that calculation that supports the regulatory analysis.

So let me just offer that we'll get you that answer so that your question is satisfied and we scratch that itch, and we'll try to do that, in fact, before the end of the morning. Okay?

CHAIRMAN SCHULTZ: What we would like to hear is a description of what is done now --

MR. JOHNSON: Yes.

CHAIRMAN SCHULTZ: -- as well as we describe what it an approach going forward, what would be done going forward.

MR. JOHNSON: Yes.

MEMBER REMPE: What is the least you think the models need to be improved to go forward?

MEMBER STETKAR: That's right, because the

proposal here is to apply this on a generic basis, which means the agency will need to make decisions for the whole fleet. Now, if this is reactionary responding to a particular event, a particular event happens at a particular plant, and the agency will need to make a decision going forward. Does that event meet the criteria generically, fleet-wide, of satisfying inclusion in this design extension category is my understanding of this proposal.

To do that, you need some tools to support that decision making, and at least as long as you're using that delta CDF and CCFP, those tools ought to give you a broad perspective across the whole fleet whether or not that particular event satisfies these criteria.

MR. JOHNSON: Absolutely.

MEMBER BLEY: The second one of those measures, before you respond to that one, the CCFP is conditional. It depends on what the event is, and I guess this is a place where those other issues of being narrow when we look at a new event that occurs, you want to say what are all the things that can cause this event.

Given that this is the event that we're talking about, like loss of power, does that make some

initiators more likely than others?

What are the kinds of initiating events that lead to that, and do each of those kinds of initiating events make containment failure more or less likely?

So you recall have to dig pretty deeply to do this in a meaningful way, I think.

MR. JOHNSON: Okay. I think we understand the question. I would leave you with the point that we didn't intend that the decisions that would support this piece of this criteria going forward are things that we use. We have tools that do this today, and so we need to explain to you how that works and how it would work as a part of this recommendation. I think that's the take-away to your question.

MEMBER BLEY: That is.

MS. HELTON: Mike, sorry to jump in here. Fred Schofar is on his way over to help address this question.

MR. JOHNSON: Okay.

MS. HELTON: So as soon as he gets here, we can take a crack at answering this.

CHAIRMAN SCHULTZ: Can you identify yourself for the record?

MS. HELTON: Oh, I'm sorry. this is Shana

Helton, the Branch Chief in Rulemaking in NRR.

Thank you.

CHAIRMAN SCHULTZ: Thank you.

MR. DUDLEY: May I go to Slide 13 now?

CHAIRMAN SCHULTZ: Yes.

MR. DUDLEY: Okay. All right. I already said this. We would grandfather the existing beyond design basis requirements unchanged into the design basis extension category. To the extent they needed to be adjusted in the future, we would use the new criteria associated with the design basis extension category so that those rules would evolve to generally have consistent criteria in the future.

We would add the ongoing --

MEMBER SHACK: Explain that evolution again. I missed it.

MR. DUDLEY: Well, to the extent that any of these --

MEMBER SHACK: Rules can change.

MR. DUDLEY: -- rules that were added unchanged, to the extent that it needed to be modified in the future, we would use these criteria on Slide -- which was it? Twelve? I don't know. The criteria in the Staff guidance for the new design basis extension category so that they would be, when they're modified

in the future, brought into consistency with all the other rules in the category.

CHAIRMAN SCHULTZ: That's back on Slide 11.

MR. DUDLEY: I didn't explain that very well, but that was the intent.

So the other thing, the question is: well, why is this only forward looking? All right. We do not recommend going back and searching for additional events, scrutinizing the licensing basis of existing facilities as the NTTF recommended under 1.4 because we believe that a number of the ongoing rulemakings, and particularly the mitigating strategies rule, and the other work we're doing in NTTF Recommendations 2 through 11 is going to address and investigate a wide range of safety concerns, and we believe that that will implement necessary safety improvements.

If you were to go back and identify some new event or sequence that you hadn't thought of before, it's highly likely that the mitigating strategies rule would at least give you partial mitigation for that event. So the existence of the mitigating strategies rules lessens the value of going back and looking for some of these additional

accidents or sequences.

As we've said before, we already have processes to generically address these new issues as they arise. The existing plants have performed the IPE and the IPEEE studies for severe accident vulnerabilities, and they have voluntarily addressed a number of those deficiencies, I guess is what they're called.

Now, you will hear later when we talk about voluntary initiatives that we're going to recommend taking a look at whether the voluntary implementation was done effectively and whether it has been maintained over time since that activity was done.

MEMBER SHACK: But again, it comes back. Take the mitigating strategies, you know. You're finally going to get portable power supplies for hydrogen igniters, which has been around for ten years.

MR. DUDLEY: Right.

MEMBER SHACK: I suspect that you're going to get a fair amount of action on coolant seal leakage just because it's going to be hard to deal with in the mitigating system, which, again, has been around, and why did we have to wait for an event to decide that

these were important and these were adequate protection issues?

You know, why isn't that going to somehow change? Don't we see there was a deficiency there that should be changed, that we didn't have to wait for Fukushima to do these things that we've suddenly now decided are adequate protection, although we thought a lot about them for decades?

MR. DUDLEY: Well, you know, I can't really address how the criteria for adequate protection or how that decision is made. We decided that we're not going --

MEMBER SHACK: I know, but shouldn't we have some criteria that would catch these things?

MR. DUDLEY: Well, we looked at those things before, and we analyzed them, and we used our start criteria and we decided that they didn't meet the threshold. It's not like we missed those items.

MEMBER SHACK: I would say maybe we ought to look at the criteria, and you know, I'm not sure we're looking hard enough at the criteria. You know, I would like to think that we --

MR. DUDLEY: Hence the fact that we're --

MEMBER SHACK: -- we would get these things, you know. When we look at the -- and, again,

you can always dump me off to Mary and defense in depth.

MR. DUDLEY: I was going to do just that actually.

(Laughter.)

MEMBER SHACK: And, you know, so, yeah, just push it down the road. You know, maybe it will catch it, and I kind of agree with that, but you know, all of this is wonderful. I mean, I really think when you look at this you sort of wonder why we weren't writing rules that had all of these requirements before because they're clearly things that we really should have been doing. How we ever wrote 50.54(hh) without these considerations, you know, is really a black mark on us. You know, that wasn't done back in pre-history. that's relatively new.

So this is all great. I'm still worried about how we identify events to go in this category, and that's all going to come to Mary now, and she's going to give me some diagrams and stuff.

MR. DUDLEY: Well, not necessarily because one of the examples you gave, the backup power of the hydrogen igniters, one of the reasons we didn't get that is because licensees came in and they had a voluntary initiative for some kind of elementary

portable generator or something that caused us to fail the backfit rule test with this voluntary initiative.

MEMBER SHACK: Yeah, but with the Mark 3s, you never made it with or without it.

MR. DUDLEY: Okay.

MEMBER SHACK: And now it's, you know, suddenly included, which is a good thing.

MR. DUDLEY: Well, we're trying to -- the activities associated with volunteer initiatives, we're trying to adjust some things that we think --

MEMBER SHACK: I'll agree. Those all look wonderful, too. Again, you sort of wonder why we haven't been doing it that way.

There's lots of things I like here. I still think we're short of this fundamental notion of only looking reactively and how we're going to somehow bring this defense in depth, and I guess I should wait for Mary. So I'll stop here.

MEMBER SKILLMAN: Well, let me build on Bill's just for a minute because I think it's clear in our minds we saw a huge physical event in the last week, and if that tornado instead of striking where it did had come rumbling over Callaway or Wolf Creek or Cooper or Fort Calhoun or Duane Arnold, right in the belt, we might we having a different discussion today,

and it gets to Bill's question on design criteria.

For years and years we took comfort in General Design Criteria 2, all these great things we were going to design against, but maybe we didn't get it right in terms of the magnitude of some of the phenomena that the plants are exposed to.

A couple of examples, TMI had to reassess its water level because of flooding in the Susquehanna River.

There's probably a question at For Calhoun: who controlled the river? The people at the station didn't. They just watched the water come up. Might it be that the Corps of Engineers had some culpability there?

We've talked around this table of flooding in the Tennessee River, with all the plants that are susceptible to sequential dam failures, and there's good, old General Design Criteria 2 we kind of take credit for, plants designed against floods.

Maybe the way we design criterion or the criterion in general has not been as thorough as it should have been, and so you're going to add a category. These normally get handled as programs at the site. That's the way utilities handle things like SBO or ATWS or the other portions of the rulemaking

that have been added on, when in reality there are fundamental questions down in General Design Criteria 2 where perhaps we've not been as thorough or effective or expansive as we need to be.

MR. DUDLEY: I'm not an expert on external hazards, but I thought I heard that our tornado protection was very robust, and so I'm not really sure that the tornado that they had that you referred to would cause substantial damage at existing sites that meet the current criteria.

The flooding criteria and seismic criteria perhaps are a little less robust, and we are looking at flooding criteria and seismic criteria right now in the other Fukushima recommendations.

So for the purpose of the Recommendation 1, we've deferred all of the flooding and seismic activity to Recommendation 2-1 and 2-2, I believe, and in the event that they, perhaps likely event, that they are going to change the criteria, then that changed criteria, that may become a design extension rule, and we would place it in a category, and then we would have appropriate treatment requirements for those changes in those additional enhancements that, you know, might come about as a result of changing the requirements for seismic or for flooding.

MR. JOHNSON: Yeah, I think that Dick's got it exactly right. So I talked about the fact that there were sort of five categories of things that came out of the Near-Term Task Force, and that one of them being enhancing protection and looking at external events and the kinds of things that are captured in GDC-2, for example, and that, of course, we're doing work.

We should have been looking at existing plants it turns out with respect to more modern methods to see what has happened in terms of what you would do with the analysis from seismic and what you would do with your analysis on the licensing basis and for flooding, for example, and other hazards, external hazards.

So we'll capture that. That's been captured as one of the actions. There was a Tier 3 Fukushima item that deals with setting up a periodic reevaluation, right, that makes that a living requirement.

So I think with respect to those kinds of things we have as a result of the actions that were taking on Fukushima, we're addressing those, but I don't want to use that as the answer to take away from what I think is your more fundamental, more important

question that I think you're asking, which is: how do we make sure that whatever fixes we do to the framework are sufficiently broad so that we look for the next one of these things and we take actions appropriate to address them so that we're not reacting to them.

And in a number of instances I think what you're going to hear, I think our perspective is that there have been instances where we didn't take the action and we didn't move forward with regulatory action because if we had looked at defense in depth differently, there were instances where we would have done more, but we didn't.

And so I think, again, it's when you bundle all of these changes to the framework that we'll be able to better answer your question, but at the end of the day if we haven't answered your question, I hope you continue to ask it because I think in our hearts of hearts, that's where we want to go with respect to what we're doing with them, frankly. We want to be able to answer that question.

CHAIRMAN SCHULTZ: Michael, you've whetted our appetite for defense in depth, and we can't wait to get to Mary's presentation

MEMBER REMPE: Before you --

CHAIRMAN SCHULTZ: Go ahead, Joy.

MEMBER REMPE: This slide though, you have like a complaint about the new reactors are required to have plant specific PRAs, but they're not required to submit the PRAs is one of the things we've noticed in our interactions, and sometimes when they voluntarily submit them, the quality of them is inadequate.

Have you thought about perhaps putting more rigor in the PRAs that they're required to have?

MS. DROUIN: I'll take a shot at that one.

We have been working very hard with ASME and ANS in developing PRA standards to get to this very question, and ASME and ANS have issued a PRA standard for operating reactors, for PRA for operating reactors. They are very close to issuing a standard for a PRA for plants that are in, you know, the design certification stage.

Once the new reactor becomes operational, then it falls under the operating PRA standard.

MEMBER REMPE: Okay.

MS. DROUIN: And then the other thing that the standard, you know, does require is that all of the plants are required to do an external peer review of their PRA, and the NRC not only participates in the

development of these standards, but we do a very detailed review of the standard, and we endorse it under Reg. Guide 1.200.

So you have seen a lot of the revisions to the standard, you know, based on the endorsement from the NRC taking certain exceptions, you know, and recommendations to improving these standards, and it will continue to live on forever in terms of constantly looking at it and improving these standards.

MR. MIZUNO: This is Geary Mizuno, NRC's Office of the General Counsel.

I agree with Mary, and I just would like to add one additional point, which is that the NRC can require or have its expectations with respect to the quality and completeness of PRA regardless of whether the PRA is submitted to the NRC physically or electronically or not.

If we're going to require it and be maintained at the plant, we can require it to be maintained at the plant and meet our expectations. So the question about submission to the NRC is really completely separate and subject to a different set of considerations over the question about whether that PRA, even if maintained at the plant, needs to meet

NRC's expectations.

MS. DROUIN: And I would just like to elaborate on your statement about them not submitting the PRA to the NRC. When you go look at Chapter 19, I believe, there's a whole list of things that they are, you know, to submit on that PRA. So all of the most important stuff that as a regulator we would want to know coming out of that PRA, you know, is listed.

But, no, they don't have to submit those 20 -- and I'm just throwing that number out of the air -- 20 some odd volumes because all the documentation behind the PRA is, I mean, gigantic. So I don't know what we would do with all of that even if we had it.

But the things that we want to know from the PRA, you know, they are required to submit that.

MEMBER STETKAR: I'll make this brief, Steve.

MR. DINSMORE: go ahead.

MEMBER STETKAR: We're walking a fine line here, and none of the words that have been stated accurately characterize the situation. The material that's submitted in Chapter 19 is a summary of results of the PRA. It does not give you confidence of what was omitted from the PRA. It's the results of what was analyzed in the PRA that was used to give you

those results, period. That's all that's there.

MS. DROUIN: Oh, it's more than that.

MEMBER STETKAR: Mary, I've looked at several of them. so I'll just make that statement.

On the other hand, you're absolutely right that the PRA that is performed by the time the fuel load is accomplished must satisfy all of those requirements that you listed. That is the requirement, and it must have an independent peer review.

It is not submitted to the Staff for a formal review unless the PRA is later used in some sort of licensing application when the Staff, indeed, would look at the PRA supporting that licensing application, and the licensee -- at that time it is a licensee -- is required to keep the PRA up to date, updated every, I think, is it four year? Three or four years or something like that.

So there are actual regulatory requirements for both the quality and the maintenance of that PRA in Part 52.

MEMBER BLEY: And it's available for audit.

MEMBER STETKAR: And it's available the audit. Staff can go in there at any time and audit

that PRA, and at that time they can look at level of detail and completeness and things that might have been omitted from the design certification PRA if you want to characterize it that way.

So as I said, it's kind of between a little bit what we heard here.

MR. DUDLEY: I'm going to go to the next slide now?

(Laughter.)

CHAIRMAN SCHULTZ: Well, I just wanted to make one comment on the last bullet then. That seems to set an expectation that if we had more resources at the NRC, we would be often doing more associated with searching for events and other elements to broaden our search for things that we want to examine and include.

I'm not sure based on the other bullets that that, in fact, is the right conclusion. So I'm not sure that resource limitations is a reason why we're not searching. Rather it's the more important -- if it were important, I'm sure resources would be found to delve into more activity here, but just a comment.

MR. JOHNSON: I think it's just the reality of what we deal with in terms of the demands on that skill set, for example, our resources and

licensee resources. Our focus, our continuing ongoing focus on operational safety, so for example, the folks who we could throw at this in terms of looking in the past for things that we might want to bring forward are also the folks that we wanted to have at the fingertips of the regions and making decisions, real decisions, real time decisions about the operational safety of plants and issues that have been found.

So it's not the overriding factor, but it's one of the things that we have on our minds about, from our perspective, about whether or not the benefit that you would get from doing that is commensurate with the cost.

CHAIRMAN SCHULTZ: That's right. So it's a matter of appropriate balance.

MR. JOHNSON: Yes, absolutely.

CHAIRMAN SCHULTZ: Thank you, Mike.

MEMBER REMPE: Actually, I have another comment to what John was saying. If you're going to wait till after you load fuel for a complete PRA but you've already been looking at design basis extension requirements, isn't that a bit late in the process?

MEMBER STETKAR: We've had that discussion, and that's the way the regulations are written.

MR. MIZUNO: This is Geary Mizuno again.

I just want to bring to the ACRS' attention that you have to understand that the current combined licenses that have been issued have reference design certifications, and under Subpart B of Part 52, the design certifications are supposed to have PRAs while the new design certifications -- so the concept here, okay, is that the design certification has a PRA to support the design that's certified, and that is why when a combined license is issued, the full PRA to address operations doesn't need to be complete at the time of issuance of the combined license. It can be developed during the time of construction and so it won't hold up the construction.

But certainly by the time you load fuel, the complete PRA to address operations -- and I'm using "operations" in the very broad sense -- must be complete to ensure that the safety of locations are reflected in the PRA for purposes of operation.

So that's basically the way that Part 52 is constructed. Now, I believe that even though the requirement for the PRA was not inserted into Subpart B until 2007, as a practical matter, the current design certifications, the later ones, the AP1000, do have design specific PRAs.

MEMBER STETKAR: One last thing, and then I will keep this less than a minute.

We're not talking about the existence of something called a PRA. We're talking about the existence of something that's a full scope PRA that's developed to the quality that one would expect of PRA. It's like saying I have a vehicle which is a skateboard with a little motor on it compared to a Ferrari. You can both of those a vehicle.

The design certification PRAs, the staff has come down on record saying that they only need to at a minimum meet quality capability Category 1, for example, which is really pretty minimal. It's a de minimis requirement of something in the PRA.

By the time that operational, if you want to call it, PRA is developed, there are more explicit quality requirements applied to it. That's, I think, Joy's point in terms of the evolution of that thing that's called a PRA.

CHAIRMAN SCHULTZ: Thank you, John.

Michael, thank you for your participation today.

MR. JOHNSON: Thank you.

CHAIRMAN SCHULTZ: Appreciate it very much.

Dick, can we go to the summary slide?

MR. DUDLEY: Yes.

CHAIRMAN SCHULTZ: Thank you.

MR. DUDLEY: Real quickly.

CHAIRMAN SCHULTZ: You understand some of our concerns that have been elaborated.

MR. DUDLEY: I do. I do.

So just to summarize, this design basis extension category would be generic. It would have both adequate protection and safety enhancement requirements within it. I would not have a common set of treatment requirements. It would not require licensees to have a plant specific PRA. It would apply to both current and future licensees and applicants. Existing requirements, beyond design basis requirements would be grandfathered into it without changing them, only if we changed them in the future. Then they would be consistent with all the rest of the criteria in the category.

It would be a forward fit application only, applying to new information and new rules issued in the future, and it's simple enough though that it can implement it right now on the ongoing Fukushima rulemakings, and it's a very low cost approach for NRC, and probably even lower. It's a negligible cost

option, I believe, for licensees, but NEI can maybe comment on that later.

And that completes my discussion on categorization. There was a question about how we do regulatory analyses.

MR. BAHADUR: Mr. Chairman, this is Sher Bahadur. I am the Deputy Director, Division of Policy and Rulemaking at NRR, and I have my staff, Fred Schofer, who is the cost-benefit analysis expert, and in talking with you he'd like to answer the question.

The question was on the SPAR model, but if the question could be repeated, then Fred could respond.

Fred.

MR. CARUSO: Yes. Hello.

CHAIRMAN SCHULTZ: It's on. We hear you.

MR. CARUSO: This is Mark Caruso from the Office of New Reactors, and I'm going to take a crack at this first, and then Fred is going to provide some additional information.

So we're talking about these numbers that are in the guidelines for regulatory analysis, the dump to CDF, dump to conditional core managed probability. Remember the backfit process for issues that the Staff wants to pursue as cost-justified

safety enhancements as opposed to requirements for adequate protection, there's basically a two-step process, and the first step is for the Staff to decide whether or not the requirements that they're proposing would produce substantial additional protection, and those are the words that are in the regulation.

So back when these guidelines were developed there was thought as to how you do do. What's the basis for that? And there was an attempt to try and make it risk informed by putting in these guidelines on how much improvement in risk you might get from a given requirement.

So to do this you really need to take the requirement you have, and you have to somehow map it to a risk assessment or risk information to come up with an estimate of what the change is. And I have to admit this is probably more art than it is science, some science. The Staff will use whatever risk information it has to look at a protection generic requirement. Remember there are no general PRAs.

So it may look at SPAR models. It may look at PRAs that have been done. It may demand information from licensees to provide information, but it's intended to help the Staff come to this decision.

Now, this assessment, this analysis, this

determination of whether or not there's substantial additional protection is then reviewed by the Committee, Committee for Review of Generic Requirements.

My experience with this was back in the '90s when we put the first shutdown rule up, and at the time I was heavily involved in that. There were no shutdown PRAs, but we were asked to actually try and come up with these numbers and map things such as if I put a safety program in place at a plant to cover safety during outages, how much does that change the core damage frequency?

Well, we all threw up our hands and said, "Ah," but we did it anyway. We tried to come up with sequences. We used information from the precursor studies, whatever you have. So that's the best we have. It's certainly -- you know, there's an attempt here to risk inform that decision making process, but it's by no means a, you know, detailed analysis, and the issues you raise are good ones. I mean, you may not have a lot of PRA information.

So that's pretty much it. if you can make the judgment, and it is really in the end a judgment, that's information that those risk estimates are helpful, but there are other aspects that go into it,

qualitative aspects, and in the end it is a judgment and it is challenged in many cases.

So if you decide that it is something that will achieve substantial additional protection and there's agreement there, then the staff moves on to the cost-benefit analysis.

MEMBER BLEY: I remember when an old friend and colleague of mine used to say generic plants have nor risk, and that's right on a couple of accounts. When you really dig into risk, you find it comes from the details of a plant's design and how it's operated, and when you take the generic look, you don't have all those details and you miss the things that are there.

So we're kind of teasing ourselves by saying that this generic approach is really risk informed. It's maybe risk hinted, but it's far from risk informed. And if we were going to hear a little more detail, that's welcome.

MR. CARUSO: Well, I was just trying to answer the question about the numbers that are used in regulatory analysis, but I think the question --

MEMBER BLEY: I think you did.

(Laughter.)

CHAIRMAN SCHULTZ: I think we have a

pretty clear picture.

MR. CARUSO: I still owe you more information on why we're not pursuing the plant specific PRA route, which is what you're driving at.

MEMBER BLEY: Yes.

MR. CARUSO: And we've already said that we recognize that in any generic approach, the downsides of that is that there could be some plants out there with things that you'll never capture because you haven't looked at it with a plant specific, you know, plant specific risk glasses, i.e., PRA.

CHAIRMAN SCHULTZ: Dick, I think we're going to have to take this under advisement for future discussion.

MR. DUDLEY: Sure.

CHAIRMAN SCHULTZ: Because it's certainly an area where we feel we need more information and clarification as to how the process would --

MR. DUDLEY: Okay.

CHAIRMAN SCHULTZ: -- develop and how it would wind up supporting such a concept. We don't see it at this point.

MR. DUDLEY: Okay. Thank you.

MEMBER BLEY: Can I go back to your last

slide because I might have misunderstood something earlier? I think you said as you went through this that this approach will not have defined treatment, and I thought earlier when you first introduced this approach you talked some about how you would go about defining the treatment categories.

MR. DUDLEY: Maybe I misspoke, but it would not set a single set of common treatment requirements. We would produce guidance, internal Staff guidance describing a spectrum of treatment requirements from which the rulemaker would select appropriate treatment for the particular rule.

MEMBER BLEY: And guidance on what would be appropriate.

MR. DUDLEY: Yeah, for the particular rule that he or she were working on.

MEMBER BLEY: Have you done any work on that yet or is this just -- I mean, this would be useful for many cases where we've been talking about --

MR. DUDLEY: Yes.

MEMBER BLEY: -- special treatment for new designs from --

MR. DUDLEY: Well, I mean, there are things out there that we would draw upon, but we

haven't -- as a working group, we're not going to really invest that effort until the Commission agrees with us that we should proceed.

MEMBER BLEY: But the truth is if they pick any of these three approaches you described, this issue is really important.

MR. DUDLEY: Well, even if they don't take any of these --

MEMBER BLEY: It's still important.

MR. DUDLEY: -- three, yeah, like it's still important.

MEMBER BLEY: Yeah.

CHAIRMAN SCHULTZ: Okay. I want to stick to the schedule as best we can with respect to the break time, which is in ten minutes, Mary. So as you start your presentation, you've got a first part of introduction, and then you'll get to some examples, and I'll pick a time in that discussion as I look at the clock directly better than you; I'll let you know when we'll need to break, and I will cut the break a little bit shorter than advertised. It's 20 minutes. We're going to go for 15.

MS. DROUIN: Okay.

CHAIRMAN SCHULTZ: So let's start now and break at 10:10.

MS. DROUIN: Slide 16.

We're going to provide you with some detail here, but you know, the purpose of the detail is to illustrate the approach, and so we beg you don't get hung up on the words because we're in the midst of vetting all of this, but we wanted to be able to give you some idea, you know, of the level of detail of what we're trying to accomplish. So we really didn't want to get into a debate on terminology and try and stay to the concept.

So if we can go to Slide 17.

You know, why are we, you know, addressing defense in depth as an improvement activity?

CHAIRMAN SCHULTZ: You can use that if you want and we can do it.

MS. DROUIN: Okay. And we really wanted to tell you when you look over the history of defense in depth, we really felt that it is very important to try and achieve consistency in the concept, the approach, and the terminology so that we have a common understanding regarding defense in depth, and that is a major impediment right now, is that when you go back and you look over the history, there is some similarities on the concept, but we get bogged down on the terminology, and everybody saying it a little bit

differently and having tremendous miscommunication.

And we think, too, once we get that straightened out to have Commission approval regarding this defense in depth concept approach and structure because when you do go look over the history and you see discussions on defense in depth even in the NRC literature, it's like a couple of sentences, and defense in depth deserves a lot more than just a couple of sentences.

In coming up with our recommendation, we just wanted to tell you we've done a lot of research and looking at the literature, and this is just a sample of the history and this is just, except for IAEA and Idaho National Labs' work, this is all really internal to the NRC, and you know, we went back as far as 1957, which was the earliest place in WASH-740 where defense in depth was discussed, to the RMTF NUREG-2150 where there is also some discussion of defense in depth, and there's a tremendous amount, you know, in this literature, and in our SECY paper we've tried to capture this in an enclosure that's quite extensive that summarizes all of this.

Now, these are things where I've listed here that have some level of discussion of defense in depth, but there's also what's not listed here is the

number of regulatory guides, of SECY papers, of NUREGS that just use the term "defense in depth."

So it is something that's prevalent and we feel that, you know, the time has really come to try and put a handle, you know, on what do we mean by defense in depth and, more importantly, how do we implement it, and how do we decide that we have sufficient defense in depth?

And those are the key things that, you know, we're trying to achieve.

Slide 19.

You do have, even though, you know, you do have some similar concepts, you know, in the sense that people will talk about, you know, there should be multiple layers. There should be multiple barriers. there should be multiple lines of defense. There should be multiple echelons. I'm just using -- these are all the different words, but you know, this concept of having things multiple is a very similar concept that goes through the whole history of defense in depth. But how people define those, what those multiple things are can vary extensively.

And then, again, I've already said there's lots of confusion and misunderstanding because of the inconsistencies in terminology, and I'm sure if we

polled everybody in this room we would get very different views in how they would explain what defense in depth is.

So how is, you know, our approach to dealing now with just trying to communicate what is defense in depth, not yet how to implement it, but you know just communicate what it is. So we're trying to approach it in a very logical, systematic manner because we do feel it's very important to achieve consistency, and also to do it in a hierarchical structure from a top down approach.

Now, and I will get to this at the end of the presentation, to show you how what we're doing here on NCTF Recommendation 1, how it also fits in with RMRF because the number one recommendation from RMRF was to develop this risk management regulatory framework of which the biggest piece of it is defense in depth, and that piece goes across agencies. We're just narrowing here on reactor safety as part of our scope.

But all of this has to be consistent and work together. So, you know, there would be an overall policy statement for the RMRF, a definition based on the overall policy, objectives and principles, and I'm going to get into tall of these,

you know, levels of defense to accomplish the policy and the objectives and principles, and then ultimately a process with decision criteria to assure that sufficient defense in depth has been achieved.

MEMBER BLEY: So from this slide I take it what you're going to show us next is highly linked to what's in the RMRF?

MS. DROUIN: Ultimately, yes. The next slide, Slide 21, is showing how this is all -- it's a very high level picture. We're going to show a very detailed one when I talk about the relationship between the two programs.

But everything in this blue box would be in thee policy statement. So there would be an overall generic policy on the risk management regulatory framework talking about the mission, the objectives, the risk management goal and the decision making process, and then based on that, one important element of that would be the overall generic policy on defense in depth, and it would talk about the definition, the objectives, the levels of defense and decision criteria.

Now, what's in those yellow boxes is what's being worked on on the RMTF. Now, the policy statement on the defense in depth falling out of the

overall generic policy then would be the policy for each program area, and so what you see there in green is what would be for the reactor area, and then you see to the right the orange box, and there would be comparable policies for each of the program areas, talking about defense in depth, how it relates to materials, how it relates to waste, et cetera.

So what I'm going to focus in on today is how we're viewing defense in depth for the reactor and, you know, what do we view as the definition; what do we view as objectives and principles and what the levels and how all of this fits into your decision criteria in implementing defense in depth.

CHAIRMAN SCHULTZ: So, Mary, what I just heard you say is that the yellow box, which has a definition for defense in depth, is not what we're targeting to in this effort, but it's where we're targeting a subset related to that, which is going to focus on the defense in depth definition for the reactor program safety area. Is that true?

MS. DROUIN: Yes, but the two working groups are working together. So as we formulate this overall generic policy, we're getting information from NTTF, and we're feeding information back. So we're not doing this in isolation, and we have common

people in both working groups, you know, to make sure that at the end of the day this all fits together.

MEMBER STETKAR: Mary, one quick one because I was going to ask this earlier. You've now partitioned the thing up appropriately. When you say "reactor," do you mean the thing that is included in some pressure vessel that generates some heat that eventually produces electricity, period?

do you include also the spent fuel, for example, at that reactor facility in that green stream on the left of your slide?

MS. DROUIN: the spent fuel pool really falls under waste, I believe.

MEMBER STETKAR: Okay. So that's over in the orange part?

MS. DROUIN: Yes.

MEMBER STETKAR: Okay. Thank you.

I don't understand that, but that's okay.

CHAIRMAN SCHULTZ: Me either.

MEMBER STETKAR: I just wanted to make sure we had that on the record.

MEMBER ARMIJO: When you said reactor program area, I was thinking you were talking about nuclear power plant, and everything in that nuclear power plant that affects safety.

MS. DROUIN: Yes, but -- but we are aligned. You know, that's just an artifact, you know, of how the NRC -- when we draw the lines.

CHAIRMAN SCHULTZ: Well, that's why I brought it up because we have a particular focus associated with Recommendation 1, and we don't want to have later the lines blurred as others define how they're going to meet up with a generic defense in depth definition, which I am concerned might be somewhat vague.

MS. DROUIN: Well, on the RMRF Working Group, all the offices are represented. So we are working as a holistic body, and as I said, you know, that information is fed back to NTTF, and we have common people. So we are getting the benefit, you know, of what we're going to be doing in these other program areas because, you know, we want to make sure whatever comes out of Recommendation 1 for reactors, you know, is consistent, and this all fits together in, you know, our overall view at a high level and for the specific regulatory program areas, that it all works together.

CHAIRMAN SCHULTZ: Okay.

MEMBER ARMIJO: Mary, just let me ask one question. The yellow box, the overall generic policy

of defense in depth, and then that defines -- it defines it for reactors, let's say for high level waste if we ever deal with that, low level waste, other activities. Do you anticipate it would be significantly different in these different areas, the requirements for defense in depth or the -- or the levels?

MS. DROUIN: Well, I'm going to get a little bit ahead of myself, but I'll just do it real quick. You know, the generic policy may tell you you need lines of defense. That's what we would say, you know, perhaps generically. You need to have multiple lines of defense that do these things.

However, on the reactor we may say we need four lines of defense whereas maybe over in the ways they say, "Well, we need, you know, to work for us, it's three lines of defense."

MEMBER ARMIJO: Okay. You answered my question. That's exactly what I was hoping you'd say.

CHAIRMAN SCHULTZ: Mary, let's leave this slide on while we take a break.

MS. DROUIN: Okay.

CHAIRMAN SCHULTZ: And we'll come back. I promised a 15 minute break so I'm afraid I'll move it back to an endpoint to the break at 10:30.

(Whereupon, the above-entitled proceedings went off the record at 10:12 a.m., and was resumed at 10:30 a.m.)

CHAIRMAN SCHULTZ: I'll bring the meeting back into session and we'll pick up with Mary's presentation.

I did want to clarify our request to you, Dick, before we proceed, and that is with regard to the discussion we did have on the design extension category, and we appreciate the additional clarification of the staff, but what we talked about there was how we have done things in the past, and I believe what the Committee would like to hear in the next Subcommittee and our discussions going forward is how do you justify that what we have done in the past is going to step forward and provide a good definition and categorization methodology to allow us to proceed forward or are there changes that, in fact, do need to be made in terms of what is brought to the process to identify again what the design extension category is and what is in there.

MR. DUDLEY: thank you for putting that on the record.

CHAIRMAN SCHULTZ: Mary, let's proceed then with your presentation.

MS. DROUIN: Okay. On Slide 21, as I said, the green area shows you what we are working on in the NTTF Recommendation 1 Working Group, and we've, you know, given thought to this and now remember that our recommendation is that -- to the Commission -- is that a policy statement should be developed, and it should address these things.

It is not within the scope of NTTF to develop that policy statement, but we're trying to give the Commission at least some idea of the level of detail of what we mean that should go into the policy statement and into the decision making criteria.

So if we go to Slide 22, and these are one-to-one correspondence with what we saw in the green boxes. So an example policy, you know, the problem is when we say policy statement, there's all different statements in this policy statement. So I was struggling with, you know, how to present this so that, you know, it was understood that all of this stuff is in the policy statement.

But anyway, in the policy statement there would be some type of statement, you know, something of the order of, you know, defense in depth approaches used to provide reasonable assurance of public health and safety from the operation of the reactor of a

nuclear power plant.

So that was set, you know, at the high level, you know, the tone, and the objectives of what we're trying to achieve, and then the next layer down would come in and have something on the order of defense in depth as a strategy that employs successive levels of defense and safety measures in the design, construction, operation of the nuclear power plant to ensure appropriate barriers, controls, and personnel are in place to prevent, contain, and mitigate exposure to radioactive material.

Then as we go along we're going to get more and more detailed as we develop, you know, starting at the high to get down into the details of what would be in the policy statement.

So if we go to Slide 23, an example, you know, of the objectives and the principles. The two biggest objectives, you know, is to compensate for uncertainties, and we want to be able to make the power plant, you know, more tolerant of failures and external challenges. So this is adding somewhat the depth to your defense in depth because we do recognize you've got a body of requirement, but we want to make sure that, you know, they are designed to deal both with uncertainties and that the plant can ride

through, you know, failures and challenges.

And then imposed on those objectives and trying to achieve that, we think that there would be a set of principles that you have to meet regardless of what level of defense that you're trying to achieve. You know, key safety functions are not dependent upon a single element, You know, uncertainties in your system structures and components and human performance are accounted for.

Application of conservative codes and standards; high quality; system redundancy; defenses against potential common cause.

Now, some people may call some of these principles. Some of them may be called safety measures. So, you know, what we need to distinguish is which of those that we think are fundamental principles versus a safety measure for meeting a level of defense, and what I mean by that is we go to Slide 24, is that for a reactor for defense in depth, we think that there's four successive levels of defense, is what we propose to define.

And the first one would be event preclusion. Now, we recognize you can't preclude event, but this is a goal. So you would want your design, you know, such that you could preclude as best

you could; have safety measures that would preclude events that could challenge safety.

And given at that level --

MEMBER BROWN: Mary, does this exclude external events? I mean, obviously you can't preclude a hurricane from hitting or a tornado from hitting. So when you say event preclusion, that made me think that what you're doing is restricting this to the range of those events would occur within the plant, like a pipe breaks or a pump fails. You get a leakage or you get -- I don't know -- a valve that stays open or something like that.

Is that --

MS. DROUIN: Okay. A hazard in my terminology is not an event. It's a hazard. You know, an event is once you have the hazard occur --

MEMBER BROWN: Oh, okay.

MS. DROUIN: -- it's going to cause some events.

MEMBER BROWN: All right. So the tornado hits and causes. That's the hazard, and then the event occurs.

MS. DROUIN: Yes.

MEMBER BROWN: Okay. All right. Thank you.

MS. DROUIN: Good clarification.

And given that, you know, you failed with that first line of defense, then you want the next line of defense, and you want safety measures that prevent the event from progressing to core damage.

And if that fails, then you want safety measures that would prevent radioactive releases from the containment and, you know, given that that fails, you want some kind of release mitigation. You want safety measures that would protect the public from the effects of the radionuclide releases.

So, you know, the lines of defense cover from the initiator all the way through. So you have the whole scenario of your accident sequence covered, and you want lines of defense to help minimize each of those areas.

MEMBER BROWN: Can I ask one more question?

MS. DROUIN: Absolutely, as many as you like.

MEMBER REMPE: I wouldn't go that far.

MEMBER BROWN: That's a dangerous allowance.

(Laughter.)

MEMBER BROWN: I understand the first

three and where something you can do, but I don't understand, and maybe it's because just I don't think well enough, but release mitigation. Now, release containment, I'm spewing contamination out. How do you protect the public other than just getting them out of Dodge?

You know, that one's a hard one for me to --

MS. DROUIN: And I'm going to come to that in a subsequent slide.

MEMBER BROWN: Okay. Thank you.

MS. DROUIN: Hopefully it will answer your question. If it doesn't thoroughly answer, you know, please let me know.

And then examples of the decision criteria, and I'm going to get into this one a little bit more, you know, is have your objectives of defense in depth met. You know, where you have safety margins, are they adequate?

Begin able to monitor; you know, looking at the contributions from the overall risk; looking at your levels of defense; looking at your principles; looking at your safety measures. Know what is the significance of the uncertainties and having some type of quantitative acceptance guidelines.

Okay. Now if we go to Slide 25, what we're trying to show on this slide is that why we feel for reactor safety, you know -- and remember for ways and materials, these levels of defense would be quite different, but this is what we're defining for reactor safety.

And what you see there is on the bottom axis is that, you know, you have normal operation. You have the event occurs. You have core damage, radiation release, and public exposed, and if you remember one of the objectives is also to deal with uncertainties, and what you see at each one of these steps is an increase, you know, in the uncertainty.

So we think that's another good justification for defining these different levels and what they expand and what they cover. So, you know, again, you know, we're trying to preclude events that challenge safety, and then as you then get past that, you start getting into, you know, the first part of your accident scenario. You know, you have additional uncertainties, and you want a level of defense that deals with that.

And then if you do get the onset of core damage as you go through your core melt progression, you know, you want levels of defense to try and

minimize that. You know, you want to contain and confine your reactor material, and then as you jump from there to your release and dealing with the public, you have another set of uncertainties.

MEMBER ARMIJO: Mary, these are really good charts, at least for me, but where I get hung up is I don't see the initiator, the hazard, the Fukushima type event that triggered all of these other things.

I don't know if there's a lot of uncertainty in the magnitude of the hazards that the plant should face, and some of that is handled by siting, selection of the right kind of site to minimize those hazards, but to me of all the Fukushima stuff, it really started with a failure to anticipate the magnitude of the hazards, and that's what we're addressing in all of these orders that we've worked on now.

Is there any element of defense in depth that ties to the hazard or starts with the hazard so that -- because this chart starting with internal events is fine, but --

MS. DROUIN: No, it's starting with any event that is a consequence of the hazard. So, you know, your hazard is going to brush across all of

these. So to me, you know, perhaps --

MEMBER ARMIJO: To me the hazard is the biggest uncertainty. I think at least from my view that's it. But for this extremely large seismic event and the tsunami, we wouldn't be sitting here talking about this topic.

MS. DROUIN: Well, in your defense --

MEMBER ARMIJO: Maybe the staff and the Commission is adequately handling hazard uncertainty with all the other things we're working on on Fukushima, but somewhere along there this just seems to start with some event and pretty much everything else is what we've been doing for years, you know, on this chart.

MR. CARUSO: Mary, can I?

MS. DROUIN: Yes, go ahead.

MR. CARUSO: Mark Caruso, Office of New Reactors and the Staff.

I think, you know, I mean, one thing that's included in here is when we talk about, you know, design, plant design, we're talking about the analysis that you do to decide what level hazard you have to protect against.

So I think for operating reactors, you know, it might be that you take another look at that

evaluation and perhaps all you can do there is you don't have siting. So you have to look at--

MEMBER ARMIJO: But they're there.

MR. CARUSO: -- should I make a facility change because now I've taken another look at the magnitude of the hazard.

So I think the prevention there is really more in trying to do the best job you can and perhaps a conservative job of identifying the level of hazard, and then based on that, you know, putting some additional mitigation in place.

For new reactors then you do have siting and also, you know, your analysis of the level of hazard.

MEMBER ARMIJO: Thank you. I have to think about this a little bit more.

MS. DROUIN: Another way to look at the way these levels work is that you want to design your plant that, given that you have some hazard, that you can preclude the event from occurring. You know, given that that fails, in looking at the hazard, you want to design, you know, your systems, for example, so that they can withstand and you can shut the plant down.

You know, contain and confine; you want

that containment to be able to withstand that hazard. You know, you want to, in dealing with the hazard, you know, you have to look at each lines of defense in dealing with how you're going to design and construct and operate that plant from all four levels.

MEMBER BLEY: Sam, let me take a shot at something for you. Remember we're here today talking about Recommendation 1.

MEMBER ARMIJO: Right.

MEMBER BLEY: And the first half of this talk was about what kinds of events might we incorporate as design basis extension conditions. One of those would be a much larger seismic event than we've thought about or a flooding event greater than we've thought about.

What Mary's talking about is given an event is defined or a hazard is defined, in the language she's using, then what kind of defense in depth do you need to be comfortable that we're dealing with that, and that's what she's talking about.

We talked about the first half of it in the first hour or so.

MEMBER ARMIJO: Yeah, I see that.

MEMBER STETKAR: One can always find hazards for which there is no --

MEMBER ARMIJO: Oh, sure, sure.

MEMBER STETKAR: -- defense in depth. Asteroid blasters, for example. You know, you have to, as Dennis said, I think you have to distinguish those concepts.

MS. DROUIN: Yes. Okay. Slide 26.

This is just bringing in the other pieces to give you a more thorough picture of this whole defense in depth. So, you know, you see the blue boxes, which are our levels of defense, and superimposed on all levels would be the defense in depth principles.

For example, if these end up being the principles, you know, key safety functions are not dependent upon a single element, system redundancy. So those principles would be applied for each line of defense.

And then, you know, for each line of defense you would have safety measures, and we've given, you know, some examples, and you might have the same safety measure. Don't mean to say that you see one safety measure for one line of defense and it wouldn't be applicable for another one. This is not a complete set. It's just to, you know, show you some ideas that, you know, there would be safety measures.

And if you come over to our fourth level, you know, what would you have in place for the release mitigation? Remote siting would be one; emergency plans; potassium iodide; the NRC incident response.

So you aren't going to be able to protect the public in the sense of, you know, wrapping them up in something and they don't get exposed. You aren't going to be able to design something. So that one, you know, has some unique aspects to it.

You know, NRC oversight would be one for your event preclusion. You know, safety systems for accident prevention; your EOPs; your SAMGs, your EDMGs for other examples of safety measures for you source term containment to contain and confine.

So this is what would go into the policy statement. Now, the actual safety measures would not be in the policy statement. That would be in some kind of implementation guidance document.

Now, if we go to Slide 27, what you see here is kind of the logic that we would envision that you would go through in making the determination on your decision criteria in looking at it in terms of both implementing your defense in depth and making the decision whether or not you have adequate defense in depth.

And there's a couple of things to this slide. First, what is shown is that when you go down to that far right-hand corner, which is adequate treatment, what you see in there is you've gone through this criteria for all four levels. So, you know, in determining that you have adequate defense in depth, you cannot put it all on just one level. You can't just say, "Okay. I've come up with a design, and I'm going to be able to preclude all events, and I don't have to worry about, you know, prevention or containment or mitigation." You know, that is not adequate defense in depth.

And the example I always like to show that shows inadequate defense in depth was the Gulf incident where they put everything -- and they didn't even do a good job there on prevention -- but they had nothing, nothing in place for mitigation. They had not even thought about mitigation, and so our version of the severe accident occurred, and they were not prepared on how to deal with it.

You know, then they were going to the drawing board and trying to design stuff of how to mitigate. So, you know, our approach is that all four levels, you know, have to be addressed.

Then in going through, you know, each of

the levels, you would just systematically, you know, start going through, you know, and are all of the principles, you know, implemented, and if the answer is no, you may enhance a level of defense safety measure. There would be some kind of evaluation to, you know, how egregious was that principle not met, and then you may make the decision to enhance the defense measure.

You know, the lever of defense measure is met. You know, again, if they weren't met, how egregious is it? You know, are your safety margins adequate? Are your known uncertainties adequately addressed? And are your applicable quantitative acceptance guidelines met?

And in that one, you know, here we ere trying to show an example, and this would really apply on all of them. It just would get too complicated to show all of this on a single slide. But, you know, in determining, you know, how egregious is something, here, you know, are the acceptance guidelines. The exceed is minimal, and if the answer is yes, you know, you may come in and say, "Well, okay. Do I have the ability to monitor?"

And if I have the ability to monitor, then I may come back and say I have adequate defense in

depth.

But my point with this slide is that we do feel that you can go through and start laying out, you know, these decision criteria and making that determination whether or not, you know, you have adequate defense in depth for each of the different levels, and if an issue comes up you would go through this.

MEMBER STETKAR: Mary, before you leave this, I just have to get into this notion again. I get this concept. I think I understand it. Where I hang up is on the next slide because -- and I wanted to keep this one up here -- because there are several places where you make decisions. Are the safety margins adequate? Are the known certainties adequately addressed?

One then must have some measuring tool to address those margins and that notion of adequacy.

MS. DROUIN: Yes.

MEMBER STETKAR: Because -- and certainly in the white paper it uses terms like acceptable levels of risk, adequate treatment of uncertainties, and yet on the next slide, you're going to get to a tick box that says, "I don't have to have a PRA."

We can't answer it today, but going

forward, as you go from this white paper to the final SECY, I'd really like to understand better how you do this in a conceptual process without the took of a PRA.

MS. DROUIN: Okay.

CHAIRMAN SCHULTZ: And even if you had a PRA --

MEMBER STETKAR: Even if you have a PRA.

CHAIRMAN SCHULTZ: -- how to fill the process. That's right.

MEMBER STETKAR: That's right.

CHAIRMAN SCHULTZ: Because defining the steps and their order is important also, and I think you've taken a shot at a structure that makes sense.

MS. DROUIN: Right, and this is just the structure. it's not --

CHAIRMAN SCHULTZ: As a first shot.

MS. DROUIN: Yes. This is not necessarily the order, and a lot of it would be iterative.

CHAIRMAN SCHULTZ: Sure.

MS. DROUIN: You know, and this was just trying to show you that we do feel that you can -- you know, are you ever going to come up with a very prescriptive process? No, but at least you can put some structure to that process and guide the decision

maker that these are the questions he needs to be asking, and here's guidance of what should go into that question.

You know, right now there's nothing.

CHAIRMAN SCHULTZ: That's right.

MEMBER STETKAR: You still have to have some tools to provide that information --

MS. DROUIN: Yes.

MEMBER STETKAR: -- to the decision maker.

MS. DROUIN: Absolutely.

MEMBER STETKAR: And make sure that the tools are appropriate for this decision process. You know, micrometer versus a meter stick, for example, depending on what level of resolution or information you want to give that decision maker.

MS. DROUIN: And that is all going to need to be worked out, absolutely.

MEMBER STETKAR: But, again, this is kind of a statement going forward between the white paper and the final SECY. There's that notion -- well, you can go to the next slide here.

MS. DROUIN: Slide --

MEMBER STETKAR: That first tick box there just says, "Well, we think it's too expensive to develop PRAs."

Okay. If that's what you think, well, what else are we going to use?

MS. DROUIN: I understand. I understand.

MR. DINSMORE: I'm sorry. This is Steve Dinsmore from the PRA Licensing Branch.

I guess I just want to react a little bit. You say, you've said several times that we think it's too expensive to develop PRAs.

MEMBER STETKAR: I didn't say that. You said that in the white paper.

MR. DINSMORE: I think we said, what we were trying to say is we're not sure that the benefit that you're going to get, the safety benefit that you can find from further developing these PRAs would be worth the cost.

I think if we said that in the way that you're saying, and I think we should go back --

MEMBER STETKAR: Certainly the message I got, and I wasn't going to say this, but I will because it's dramatic. How much has the industry and the entire world regulatory body spent because Fukushima did not have an adequately developed PRA when you start talking about cost versus safety benefit?

MR. DINSMORE: Well, you're assuming that

there was a -- I mean, if Fukushima knew about the size of the earthquake, they wouldn't have had it. I'm not sure that the PRA is so --

MEMBER STETKAR: I'll just leave it there.

MR. DINSMORE: But I just wanted to react to the statement.

MEMBER STETKAR: Just read the white paper, but --

MS. DROUIN: I mean, I think that -- I think you bring up a very valid question, and the question begs are we going to come back ten years from now and still be visiting this same question.

MEMBER STETKAR: Right. And I think -- you know, I kind of get it, but I think, again, in terms -- I don't want -- trying to solve problems here today, but in terms of at least the way I read the white paper, it seems to be building a case -- and your previous slide sort of shows that thought process -- and then you say, "Well, but we're not going to do PRA."

So there must be a thought going forward of how we can solve those measuring issues in the absence of that PRA, and I think without that, if you haven't -- you've thought about a process, but you kind of leave me hanging, you know, as a decision

maker. Why is that conclusion of no PRA required justified? Because you must have thought about some other way of kind of accomplishing that measurement process.

MS. DROUIN: Yes.

MEMBER STETKAR: The determination of that adequacy.

CHAIRMAN SCHULTZ: Yes. So this is another devil in the details.

MEMBER STETKAR: I think the white paper or the SECY needs a little bit of --

MEMBER ARMIJO: Doesn't that go back to the earlier question of how do we do it today?

PARTICIPANTS: Sure.

MEMBER STETKAR: That's right.

MEMBER ARMIJO: You know, and if we really understand how we do it today and we find that acceptable, this would be okay, but --

MEMBER STETKAR: But mary has already established the notion that we don't coherently, let's say, and Mary can probably explain this better than I can, address defense in depth because we sort of know what it is, but haven't really defined what it is.

MEMBER BLEY: Well, she hit on it early. There are vestiges of it everywhere. If you go look

in the regulations and try to find it --

MEMBER STETKAR: You can't find it.

MEMBER BLEY: -- you're busy for the next, you know, until you run out of time.

MEMBER STETKAR: So that in that sense the current process doesn't explicitly address it because there isn't anything to measure against in a regulatory perspective.

MEMBER BLEY: She doesn't give quite the sense that we had a few years ago on another projects where everybody who came to talk about it knew exactly what it was. We all knew somewhat different things, sometimes radically different things we'd say. So getting that coherence may help.

CHAIRMAN SCHULTZ: Well, let's couple this to what we described earlier, Dick, with regard to the elements that, in fact, will be required for definition, structure, decision making, and quantification and speak to that as we go forward.

MS. DROUIN: I'd like to elaborate on a point that Steve brought up, you know, because, you know, we do have the backfit rule, and you have to get past the backfit rule. I think that when we talk about a plant specific PRA -- and these are my own personal views here -- is that we're asking the wrong

question because when you ask that question just on a specific issue, you know, you're always going to come up and not be able to cost justify it.

To me it should not be on a specific issue. We should be asking PRA across the whole body of regulations, across the whole way that we deal in the regulatory process, and you know, does it help us and does it help the licensees, you know, in making better, you know, design decision making, better, you know, licensing decision making, better operational decisions?

Instead of saying does it help me on the specific decision, you know, and if you keep asking that question on a specific decision, you're always going to come up against it's going to be too expensive, but you know, is it helping me in my whole decision making process? I think that you would come up with a different answer perhaps.

CHAIRMAN SCHULTZ: Well, let's go to the next slides --

MS. DROUIN: Okay.

CHAIRMAN SCHULTZ: -- which will wrap this back into the --

MS. DROUIN: Slide 29.

CHAIRMAN SCHULTZ: -- risk management

regulatory framework.

MS. DROUIN: I want to just talk about a little bit about the relationship between NTTF and the RMRF.

NTTF Working Group, as you know, is dealing with defense in depth for power reactor safety. It's also looking at the process for addressing beyond design basis events and voluntary initiatives.

When you look at the RMRF Working Group, we're providing recommendations for a draft policy statement for a risk management regulatory framework, and it addresses both the overall agency and each program area, and defense in depth is a major piece of that policy statement, and we're developing a detailed plan for implementing the recommendations in 2150, which include the design basis event category.

The voluntary initiatives is not part of RMRF. So we only overlap on two of the improvement activities with NTTF.

Our working group will disposition the recommendations for power reactors based on the decisions made in NTTF as guided by the Commission SRM, and I'll try and clarify that a little bit more on the next slide.

Both working groups were working very closely together, and we have common staff on both of the groups to ensure that that communication, you know, occurs and that we have consistency and efficiency.

Can we go to the next slide?

This is showing in the blue everything that would go into the policy statement, and you can see there in that little purple box where the NTTF fits in on the policy statement.

There's also the implementation guidance and, you know, we're developing across all the program areas and NTTF. You can see that one box there called "safety."

There is a dotted line up there to the overall generic because we want to make sure that whatever is developed on, you know, the safety is consistent with the generic. So there is that tie there.

So that's just in a highlight shows you that even though what we're doing on NTTF on defense in depth is very important. It is going to be fitting into this overall policy statement that we're developing across the agency.

So if we go to Slide 31, what you're

seeing here is how this is fitting together, you know, schedule-wise. You know, the far left-hand yellow arrow is showing the two working groups, you know, are giving information back and forth.

On December 2nd, the NTTF notation vote paper, you know, goes forward on their recommendation for defense in depth policy statement describing the concept with examples and the proposed new event category.

Now, we're planning on doing Commission briefings immediately after that paper so that they understand and when they make a decision they understand how it fits into the RMRF.

Our SECY paper is directly -- our date is directly tied to the Commission SRM that will be issued from the NTTF SECY paper. Those dates there, those are the dates that we're supposed to meet, but there's an assumption that the SRM will come out on March 2nd. Our SECY paper is due six months after the SRM. So right now, the EO's office has assumed we'll get the SRM in three months. We may get it sooner. You know, we may get it, you know, within a couple of weeks or it might take six months, but since that date is, you know, unknown, you know, our plan is to have a draft policy statement and a draft plan completed by

the end of this calendar year.

So we're working very hard, and we also have contractor help to help us. So when our SECY paper goes forward supposedly on September 2nd, you know, it will have a draft policy statement for Commission consideration to formally go out on public review and comment, and it will have a detailed plan, and then we'll see what comes out of the Commission SRM.

The plan is that during that six months, is to make any changes that we'll need to make as a result of the Commission SRM.

So that's, you know, all I had to say on defense in depth.

CHAIRMAN SCHULTZ: Very fine. Thank you.

Just a note there. John and I meet with Mary separately last month, end of last month, to talk about this connection between work that she's just presented here, the work that we're discussing today, and the future work related to the overall program, and you've done a great job putting that together in a picture for the Committee that will be helpful. But we'll just have to continue to watch that and see the developments going forward.

MS. DROUIN: Good. The one thing I --

CHAIRMAN SCHULTZ: Because it's very connected and very --

MS. DROUIN: -- I made a note but I forgot to say, is that, you know, Dick talked about that there's a public meeting on June 5th --

CHAIRMAN SCHULTZ: Yes.

MS. DROUIN: -- in the morning. We are piggybacking on that, and we're having a meeting that same day in the afternoon, and meeting notices have gone out and they've referenced each other. So like when you see the meeting notice on the RMRF, it tells you that there is a meeting on NTTF in the morning, and it's in the same location.

MEMBER STETKAR: We're also working -- I don't know if you've talked to John Lai, but working to try to get the Subcommittee briefing on the RMRF hopefully on the same day of our NTTF Recommendation 1 Subcommittee meeting in September.

CHAIRMAN SCHULTZ: And we have a slot available.

MEMBER STETKAR: And we have a slot available.

CHAIRMAN SCHULTZ: We'll see if we can't make that happen.

MR. LAI: It will be in September.

MEMBER ARMIJO: Mary, on your Chart 30, which I think is -- I want to add again I think these are really good charts to help understand how this all will fit together. I was just wondering if somebody made an overlay that said this is what we have today how much of this chart would be blank.

MS. DROUIN: Probably all of it>

MEMBER ARMIJO: All of it? That's what I was worried about.

MEMBER BLEY: With respect to our policy statement. That's what this chart is about.

MEMBER ARMIJO: Yeah, the policy, but we do have at the lower things these levels and a variety of guidance documents and regulations. So we have a lot of the implementing stuff that exists today, but not the policy that gets you there.

You know, we have --

MS. DROUIN: Yes.

MEMBER ARMIJO: Safety measures. I guess that's what I was talking about. We have a lot of safety measure stuff today across the board.

MS. DROUIN: Yes. There's a lot of those -- yes, I mean, it's not like we don't have defense in depth in our plants.

MEMBER ARMIJO: Yeah, yeah.

MS. DROUIN: Of course we do.

MEMBER ARMIJO: But it doesn't come out of a very well defined and structured policy.

MS. DROUIN: Right. And the other benefit, I mean, we aren't talking about going backwards because we do have defense in depth, but as we go forward on decision making, you know, this will as events and things occur, will then force us to go systematically through and consider, really consider defense in depth and have we really achieved it and how we would achieve it to deal with the decision under consideration.

CHAIRMAN SCHULTZ: Let's leave that point, Mary, at this time and we will come back to it I'm sure.

MS. DROUIN: Yes.

MEMBER SHACK: I just want to congratulate Mary on that very eloquent statement about how useful it would be to have PRAs, considering it's the totality of all the questions we asked, you know. You'd save it for a letter.

(Laughter.)

MEMBER STETKAR: It's on the record.

MR. DUDLEY: Okay. Next Dan Doyle will talk about Improvement Activity 3, which is to clarify

the role of voluntary industry initiatives.

MR. DOYLE: Okay. Activity 3 is not quite as broad as the other activities. It's more focused, and I'll try to explain that in the presentation that I'm going to give here. So I'm just pointing that out that this is slotted for half an hour on the agenda, and looking at the close, it looks like we're a little bit behind in the time we had scheduled things to move along, but I just wanted to point that out as we move into this.

And just also about me, I've been on the working group since August of last year. I've been doing rulemaking for a little over a year, and I've been at the NRC for three years. I was in the Navy for eight years before that. So that's my operational perspective that I bring to the working group, and I feel very fortunate to be part of the working group and learn about the current framework and the brainstorming ideas about how we can improve that.

And also when I joined the working group, they pointed out that my initials are DID.

(Laughter.)

MR. DOYLE: So I was lucky. I didn't get assigned Activity 2. I think Mary --

(Laughter.)

MR. DOYLE: She wouldn't let go of it, but I did get Activity 3. So that's what I'm going to talk about in this presentation.

And this activity is about industry initiatives and how they fit into the regulatory process. So I'm going to give you an overview of what this activity is and what we're recommending, what actions we recommend taking. I'll give a brief background on the topic and how it relates to the NTTF and RMTF reports, and then I'll go through a little more detail on the specific actions we're recommending, and I'd be happy to take any questions you have.

The purpose of this activity is to clarify the role of certain industry initiatives. So just big picture, three things is that we want to reaffirm the current policy that industry initiatives may not be used in lieu of NRC regulatory action for issues of adequate protection.

Another thing is that we recommend specifying when certain industry initiatives may be credited in the baseline case and the regulatory analysis, and I'll talk about that, and also providing guidance about what level of oversight is appropriate in the event that we do rely on an industry

initiative. So those are the main points for the activity.

Some background, the role of industry initiatives as you're probably aware was the subject of a direction setting initiative in the late '90s, DSI 13. There was a proposed formal process that was developed and issued for comment. There was overwhelming negative feedback from the public and the industry overall, and the NRC withdrew the program that was documented in SECY 01-121.

Industry initiatives came up again in the Fukushima and near term task force report, and they were all talked about in the Risk Management Task Force report. Specifically, those two reports , the Fukushima reports stated that industry initiatives should not serve as a substitute or replacement for requirements, but should be a mechanism for facilitating standardization of a requirement that already exists.

They also noted that there's little attention given to industry initiatives and inspection and licensing programs because there are no requirements to inspect against.

SAMG as hardened events came up as specific examples. They were in a lot of discussions,

and they were not regulatory requirements, and when inspections were done through temporary instructions, there were inconsistencies that were found and how those two things specifically were implemented, maintained and in some cases, well for SAMGs at least, maintained and how practical their use might have been in certain circumstances.

The Risk Management Task Force had a different perspective. They talk about how through industry initiatives and other licensee specific initiatives there's a gap that develops between the regulations and the licenses and what's actually in place, and then when an issue comes up through the reactor oversight process, there's a question about what to evaluate against do you credit this thing that may be a voluntary industry initiative or not.

And before moving on to the specific actions we're recommending, I just wanted to first explain industry initiatives again briefly, that there are generally three types. These descriptions that are on the slide come from the current version of the Regulatory Analysis Guidelines.

The first type are initiatives that relate to an existing regulatory requirement and describe a means of compliance. So two examples would be the BWR

vessel internal program and the PWR material reliability program. So there are rules in place on reactor and coolant integrity and these initiatives given to the nuts and bolts of how the industry will comply with the existing rules. That's the first type.

The second type is those that are used in lieu of regulatory requirements being put in place, and those have varied over the years. Primary examples coming out of Fukushima again are the BWR Mark-1 hardened vents and a more recent -- and SAMGs -- a more recent example is backup power for hydrogen igniters for BWR and ice condensers.

The third type of industry initiatives are those that are undertaken by the industry sometimes with or without involvement from the NRC. They involve matters where it's unlikely that we would put a new regulation in place. An example would be the groundwater monitoring program, which was a big issue. After many discussions the NRC basically decided that we were not going to do anything in addition to what the industry was doing through their initiative.

The main focus of Activity 3 that we're discussing today is really on the Type 2 initiatives, and to answer the question what do you do when you're

considering imposing a generic regulatory requirement and there's an industry initiative that may also address the issue. So how do you move ahead of that?

So this is what we recommend, to clarify the role of industry initiatives. One action would be to develop either a Commission policy statement or advise existing guidance to achieve two different things. The first is to reaffirm that industry initiatives may not be used in lieu of NRC regulatory action, adequate protection issues.

And the second thing is that it will direct that industry initiatives may not be credited in the baseline case of the regulatory analysis unless there is high likelihood that industry will effectively implement and maintain the initiative over time.

And also we intend to revise oversight processes to verify implementation and effectiveness of certain Type 2 initiatives which the NRC believes are important from both the safety and regulatory perspective.

MEMBER BLEY: Can you go through this slide again, the two-year bullet.

MR. DOYLE: Sure.

MEMBER BLEY: From the standpoint of the

three types you had on the previous page? I mean, the industry can clearly do things. The plant can do things it thinks improves its performance, safety, whatever, as long as they don't conflict with regulation here at NRC. So that first bullet, I don't know the exact to which it's intended to apply.

You aren't going to go in and find out everything people are doing and make sure you have guidance or Commission policy statement associated with it.

MR. DOYLE: Right.

MEMBER BLEY: Can I get an amplifier to your comment? Because in your white paper you said that your Activity 3 was only going to deal with Type 2 initiatives, not Type 1 and Type 3, and you didn't say that until the fourth bullet here.

MEMBER BROWN: Well, that wasn't even really as crisp as I would -- I mean they were very -- this just says verify the implementation of Type 2. He didn't really say we're not going to look at the other ones. It's implied. At least that's my impression because I haven't looked at the next slide.

MR. DOYLE: Right.

MEMBER BROWN: And I just wanted -- okay. Go ahead and answer Dennis. I just wanted to

highlight that thought because it seems I was going to make it later, but it seemed to be a spring --

MR. DOYLE: Right. So it comes up a lot that the -- trying to understand how things that the industry does, that, you know, there's not a way that we're -- this activity is not an attempt to control or put an arm around everything that's happening. The focus is really on regulatory decision making. The NRC gets to the point where we feel we need to or are considering taking a generic regulatory action.

At that point and that decision, how do we account for the fact that there may be an industry initiative about that? So I thought you were asking about, you know, what if a licensee decides to do something that relates to adequate protection. Is this policy statement somehow going to prohibit them from doing that or how does that factor in?

but the point of the policy statement is to do the second and third bullets, is just to make it clear that when we're considering imposing a regulatory requirement we will not -- if it's an adequate protection issue, we will not say, no, the industry already had its initiative. It's okay. We don't need to put this requirement in place.

We should put the requirement in place.

That's what the policy is saying. That's what this activity is posing, and then that's what the policy statement would say or the revising the guidance.

The next bullet is to explain in that decision making process that the NRC should ask itself how likely is it that this will be effectively implemented. So there are a number of different guidance or things that could go into the coming to that conclusion, but that's another aspect that would be included in --

MEMBER BLEY: Is this in any way a change in policy, these two bullets?

MR. DOYLE: Well, the first bullet is not, but what would be a change is that that second bullet exists in an SRM 99063, I believe. It's the first sentence in there, and that's where it's clearly stated by the Commission that this is the policy.

It's also sort of incorporated in the Regulatory Analysis Guidelines so that the basic answer is no for the second bullet. That's not really a change, but it would elevate the visibility of it.

MEMBER BROWN: Just let me --

MR. DOYLE: Yes, sir.

MEMBER BROWN: You made another statement in here where it said for the Type 2 that you may be

in the -- this is in relation to your second bullet. You say industry initiatives may not be used in lieu of NRC regulatory action. However, you state industry initiative may be used to provide safety enhancement without the need for regulatory. In other words, you could be considering action, but they've taken voluntary actions which abrogate the necessity of an issue --

MR. DOYLE: That's not an adequate protection issue.

MEMBER BROWN: Okay. And that, I don't read that out of this.

MR. DOYLE: Right.

MEMBER BROWN: I understand that if you've already got an action, some regulatory requirement in place, obviously you can't use that to substitute, but it doesn't say that you would -- the SLAD (phonetic) doesn't say that you would then not do the regulatory action because of the voluntary initiative.

And so I'm a little bit fuzzy on how if you're not going to do that because the initiative is there and you talk about then how do you then verify that they actually implemented in a manner that's consistent with not taking your regulatory action and the long-term oversight of it?

MR. DOYLE: Well, I think the important thing is that you would, in the case of the third bullet there, you would -- you had a rule you were thinking of issuing and there was a voluntary initiative. If you decided that you didn't believe that it would be likely that that activity could be implemented and maintained for a long time, then when you did your regulatory analysis for that rule, you would not give credit for the voluntary initiative that you didn't think was highly likely to be maintained over time.

So then you would go through your regulatory analysis with all the regular criteria we have in the backfit rule and in the Regulatory Analysis Guidelines, and the result of that would determine whether or not we would issue a rule.

And if we issued a rule, we'd have a requirement. If we didn't, the industry's voluntary initiative would still stand.

Does that clarify?

MEMBER BROWN: Well, but do you have to -- if you accept a voluntary -- okay. Let me phrase it more simplistically. I understood what you said, but if you accept an industry initiative and make the decision not to issue a regulatory action, does it

become incumbent upon you all then to implement or execute something with your region offices or within NRC to monitor that over the subsequent period of time or not?

MR. DOYLE: Well, when you say we accept a voluntary initiative, I want to clarify. We don't accept voluntary initiatives in the scenario we're talking about. What we're talking about is a rulemaking that we're thinking of implementing, and we go through the regulatory analysis to determine if it meets all the criteria for a rulemaking.

And if it does not meet the criteria for a rulemaking, then we would accept it as a voluntary initiative because we can't issue a rule on it. So does that --

MEMBER BLEY: Well, you're not objecting to it. They're doing what they're doing --

MEMBER BROWN: I understand.

(Simultaneous conversation.)

MEMBER BROWN: But you're recognizing the voluntary initiative --

MR. DUDLEY: Yes.

MEMBER BROWN: In the fact that you are not then finishing some subsequent action on issuing. So maybe my term "accept" --

MR. DUDLEY: Okay.

MEMBER BROWN: -- it's through the back door that you've effectively accepted that in lieu of proceeding with something. It's just to me if you're going to have an industry initiative where you're going to use it kind of; yeah, now we don't really need this because it accomplishes the same goal; then you have to have some follow-up action or long-term thing to make sure that's done in the overall oversight process.

MR. DOYLE: And what's what we're recommending, and that would be --

MEMBER BROWN: Well, I didn't see how that was explicitly stated here.

MEMBER STETKAR: You're really talking about the verifiability of that high likelihood.

MEMBER BROWN: Yes.

MEMBER STETKAR: Regulatory verifiability of high likelihood.

MEMBER BLEY: But the second bullet up here says that if you get to this point, you essentially have to put a requirement in place, if it's an adequate protection issue and you need something. So you have to put a requirement in place.

Then when you have the requirement, you

might accept what they're doing if it looks good, but with some kind of inspection or continuing verification activity is what I think it says.

MR. DUDLEY: Your second scenario was only for a non-adequate protection issue, right?

MEMBER BLEY: No. It's an adequate protection issue that then your second bullet says you have to put a regulation in place.

MR. DOYLE: Right, and then if they have an initiative about how to comply with that --

MEMBER BLEY: Yeah.

MR. DOYLE: That's what you're asking. Yeah, so that would be a Type 1 initiative, and you're asking are we going to verify that or how do we verify that. So, yes, that is included. That's actually on the next slide.

And that is related to the question were asking before --

MEMBER BLEY: I think it gets to Charlie's.

MR. DOYLE: -- where it says in the white paper that we're only talking about Type 2, and yet I didn't state that in here. So there's a reason for that, and that's on the next slide here, but --

MEMBER ARMIJO: Before you go to that --

MR. DOYLE: Sure.

MEMBER ARMIJO: -- just to keep track, it's a Type 1. Let's just say, for example, let's say it's a BWR VIP, vessel internal program, Type 1. It was put in place to ensure that existing requirements are met.

Now, how is that currently -- do you monitor its effectiveness and verify that it's going to continue?

MR. DUDLEY: As rulemaking staff, we are not experts in that level of detail.

MEMBER ARMIJO: Well, clearly, I know it's being done, but how does a regulator assure that it's being done?

MR. DOYLE: You're asking how the NRC currently verifies--

MEMBER ARMIJO: Yeah.

MR. DOYLE: -- that the BWR VIP program is effective?

MEMBER ARMIJO: Since that's a Type 1 that exists.

MR. DOYLE: Right.

MEMBER ARMIJO: And I just want to make sure that it --

CHAIRMAN SCHULTZ: Bill Reckley is here.

MR. RECKLEY: Bill Reckley from NRR.

In that particular example, the mechanism we use is reporting, not really inspections, but we receive reports of their inspections of the vessel internals. Those are submitted as part of that program to NRR, and we look at them here at Headquarters.

MEMBER BLEY: Does it end up -- is that open to audit? Do you ever audit those reports, those inspection reports?

MR. RECKLEY: That they submit?

MEMBER BLEY: Yes.

MR. RECKLEY: Oh, yes. Sir, they're looked at by Headquarters Staff.

MEMBER ARMIJO: Okay. And that would satisfy the high likelihood issue?

MR. RECKLEY: Yes.

MEMBER ARMIJO: Okay.

MR. RECKLEY: Although, again, in that example, that's a Type 1.

MEMBER ARMIJO: Yeah.

MR. RECKLEY: So it's a different --

MEMBER BROWN: In the white paper you listed under -- I'm just trying to make sure I understand here -- the type of Type 2, where you don't

issue a rulemaking. If you put a hydrogen igniter to put in the back of power supplies, I guess, as a voluntary initiative, and you've accepted it -- excuse me -- you've recognized that.

Now, to me that means you all have to maintain some understanding and knowledge of where that stands. Five years from now are they still maintaining that satisfactorily? And how is it being maintained?

Am I wrong in thinking that that will be monitored in some way by the Staff here, whatever reactor oversight --

(Simultaneous conversation.)

MR. DUDLEY: There's no formal program to put that into effect, not now.

MEMBER STETKAR: At present.

MR. DUDLEY: And that's one of the things that we're recommending, is that we create an oversight structure for these.

MEMBER BROWN: For these voluntary things where you've -- like the hydrogen igniter. I used that. That's the first example that we --

MR. DUDLEY: That we end up accepting because we can't justify a rulemaking, yes.

MEMBER BROWN: Yeah, but then you have

adequate oversight to ensure it's maintained on a go forward basis.

MR. DUDLEY: Right.

MEMBER BROWN: Okay. That's what I didn't understand that totally from reading all that stuff in the white paper. Thank you.

MR. DOYLE: Okay. this is the last two specific things I wanted to highlight in our activity. So there are two other specific actions, not really related to the Type 2 policy statement or revised guidance that was on the last slide, but still included as part of this activity, and one of these is to review certain IPE/IPEEE commitments that were made to verify that those with the highest safety significance were implemented and have been maintained. That's one of the recommendations in this activity.

And the other thing is getting to the question you had about Type 1. So the action that we're recommending is to modify inspection procedures to provide more oversight of the significant Type 1 initiatives that the NRC believes are important from both the safety and regulatory perspective.

So the difference is that the policy statement provides guidance, on the last slide is

about the decision making, the regulatory decision making process. Do I impose a generic requirement or not? And if I decide not to, then basically if there was an initiative there, then that would be a Type 2 initiative.

Separate from that policy is the suggestion in this activity that for the Type 1 initiatives -- so we're not talking about the decision making process. There is a requirement in place -- but the action we're suggesting is that there should be a little bit more oversight. There should be more thought about certain Type 1 initiatives to follow up and to verify that they are actually accomplishing -- that they're being effective for achieving the underlying requirement.

MEMBER BLEY: How would this stuff apply to things that are currently beyond the design basis, but are in place, like the SAMGs and that sort of thing? Would this apply to those?

You're saying --

MR. DOYLE: SAMG is --

MEMBER BLEY: -- your stuff is all forward looking. So you don't even go back to things that are in place; is that right?

MR. DUDLEY: Well, we're undertaking a

rulemaking on SAMGs that --

MEMBER BLEY: Which will be separate.

MR. DUDLEY: yes. So that will become a requirement.

MEMBER BLEY: But there are classic things like SAMGs and some of the B.5.b equipment and procedures that were -- my memory is that when those things were put in place, you got letters from the utilities saying they were in place. You may have audited some of them, but after Fukushima you went out and got a re-look and found that some of that stuff wasn't really there or had disappeared or wasn't maintained and that sort of thing.

MR. DUDLEY: I believe, and correct me if I'm wrong, but I believe the B.5.b initiatives were overtaken by 50.54(hh) rulemaking --

MEMBER BLEY: That's true.

MR. DUDLEY: -- and made into requirements. I can't tell you --

MEMBER BLEY: They were, but that was some time ago.

MR. DUDLEY: Right. I can't --

MEMBER BLEY: But you didn't have any continuing oversight of those apparently.

MR. DUDLEY: I can't speak to the

oversight in that interim.

MEMBER BLEY: But would they fit --

MR. DUDLEY: There may be some in here who can.

MEMBER BLEY: -- under this? They are now part of the regulation, but there wasn't, to my knowledge, any inspection program or audit program or follow-up.

MR. DOYLE: I understand the question. that's come up in our discussions and also with management, which is a good segue to the next slide, is, well, what are the ones --

MS. HELTON: Excuse me. This is Shana Helton in the Rulemaking Branch.

I'd just like to note that I think your question on the B.5.b equipment also relates to the station blackout mitigation strategy's rulemaking activity --

MEMBER BLEY: Yeah, that's true.

MS. HELTON: -- and what's going on. And I know we'll be coming to speak to the Subcommittee on June 5th.

MEMBER BLEY: But you're not saying it's unrelated to what's here, are you?

MS. HELTON: There are with all of the Fukushima recommendations, I think it's safe to say that there are some interconnections.

MEMBER BLEY: I think so.

MS. HELTON: As Dick mentioned earlier in his presentation, he's been working closely with Tim Reed, who is the project manager for that rulemaking activity, and things that you're talking about, including treatment requirements and change management, that sort of thing, that is being worked within that rulemaking activity, but with the knowledge of where things are progressing with Recommendation 1.

But I think that's a very good question, and I'll personally take that back to Tim Reed, and we'll try to address that question also when we come back to address the --

MEMBER BLEY: Okay.

MEMBER SHACK: Yeah, Dick said it would evolve. Has any of these regulations -- reconsidered, they would bring them up to the standard they had proposed, which did include all those treatment requirements.

MR. DUDLEY: Right, right, exactly.

MR. DOYLE: So that would be a similar

idea for here. I think your question was, well, if we had these Type 2 initiatives in the past, are we going to go do something about those or not, or what about those? What about the ones that are already out there?

So I think it would be similar to that, the categorization approach in that they're there. We have developed this list. There's a table that's attached to the white paper, and this slide just shows the Type 2 initiatives. So we have done some research to come up with this list and do some thinking about the ones that are out there, but the way it relates to that is that if the NRC through its normal process comes to a point where we are considering imposing a generic requirement related to one of these things, then the policy applies.

It's about the decision making process. When we're looking to make a generic requirement, it's not a retrospective look at everything that's out there.

MEMBER BLEY: Our early statement, everything in Recommendation 1 was forward looking. I don't think it applies in this area, or maybe it does in that it would be forward looking if you applied a requirement now to one of these existing

programs. then you'd have inspections and everything associated with it or reporting requirements.

MR. DUDLEY: One of the things that's not forward looking also is we're going to go back and look at the maintenance of some of the IPE and the IPEEE commitments. So this is not -- my statement about forward looking only was for categorization.

MEMBER BLEY: Okay.

MR. DUDLEY: This effort kind of goes both ways.

CHAIRMAN SCHULTZ: For Activity 1.

Your next slide gets into that, Dan. Why don't we go through that?

MR. DOYLE: Sure, okay. so this is my last slide. This summarizes the recommended actions that I just went through. And just to reemphasize it, the big picture with this activity is that when the NRC is considering imposing a generic regulatory requirement, it is acceptable to factor industry initiatives into that decision making process unless the issue is a matter of adequate protection, or if it is a matter of adequate protection, don't rely on the initiative in lieu of taking the action.

For adequate -- and if we go through that decision making process and make some assumptions

about what the industry initiative is going to accomplish and if we decide in the end not to impose the requirement based on those assumptions, then the NRC should consider having some oversight of the initiative, and the reason for the oversight is to follow up and see if the industry initiative is not as effective as we assumed, and if not, we should reconsider imposing the regulatory requirement.

That's the big picture, and that is the end of what I had to say on this. Are there any other questions?

MEMBER SHACK: Is there not adequate protection? I mean, Type 1 initiatives do, but you then build them into the regulatory system in like tech specs or things like that. I mean, so they really can address it. they just have to address it with a regulatory backup.

MR. DOYLE: That's right.

MR. DUDLEY: There is a requirement; there's an underlying requirement. So those particular voluntary initiatives are more like a Reg. Guide, and we could inspect against them and if they weren't being maintained, we could issue a violation based on the rule, the underlying rule.

MEMBER SHACK: Every time I have to see

this statement up here I have to --

MEMBER ARMIJO: Yeah.

MEMBER SHACK: -- Type 2, not for adequate protection issues.

MR. DUDLEY: Right. That's correct.

CHAIRMAN SCHULTZ: As we go forward and get toward the SECY document, are we going to have more clarity or specificity with regard to the second bullet under the first bullet, when to credit the baseline case? That ties in, I would suspect, to defense in depth, as an example.

Also, under the full second bullet with respect to oversight of certain Type 2 initiatives, is it the intent of the group to put together some specifics associated with which Type 2 initiatives ought to be examined carefully?

MR. DUDLEY: Your first question on when to create in baseline case, again, our criteria for that is likely to be maintained over time. We will need to expand on that a little bit, maybe with some examples, to give the Commission a better idea of what that means so that they can make their decision.

Regarding the infrastructure and guidance for oversight, I mean, that's why we put together this list, and we're looking at this list, and we can do

that. We don't need Commission approval. We can actually do that on our own, but we're going to present this list to the JLD Steering Committee, and we're going to discuss some of those activities with them.

MR. DOYLE: Yes. As far as expanding on which types of initiatives would warrant oversight, yes, I think we can expand on that. And then what type of oversight are we talking about? Is it reporting or is it some sort of like a one-time inspection or some sort of ongoing thing? Yes, we can expand on that.

CHAIRMAN SCHULTZ: That's important for our development of a full understanding. thank you.

MEMBER ARMIJO: Now, you're not going to change anything on Type 3 Initiatives?

MR. DOYLE: That's right.

MEMBER ARMIJO: That's going to be left alone.

MR. DOYLE: Right.

MEMBER SHACK: Do you have an example of a Type 1 initiative where you think you need more oversight? I mean, the ones I think of seem pretty well -- steam generator tubes don't get ignored.

MR. DUDLEY: I don't -- Bill, do you want

to suggest one? Bill Reckley.

MR. RECKLEY: I can look.

MR. DUDLEY: No, no, that's all right.

MR. RECKLEY: I don't have one off the top of my head.

MR. DUDLEY: No, we don't. We'll come back to that. Yes, we do. Yes, we do.

MR. CARUSO: Mark Caruso, Office of New Reactor.

So Type 1s are the ones that are there for adequate protection, and we have -- we may have programs, voluntary programs, in place to implement the requirement.

Am I on the right page here for the question?

MR. DUDLEY: He wanted a specific example. I didn't think it was involved there in the --

MR. CARUSO: A specific example would be 50.54(hh)(2), the loss of large area requirements. We have a requirement in place for them to develop and maintain a program for, you know, having mitigating strategies for these events.

It started as an order, and the program for implementation was developed with input from the industry and the NRC evaluating it, and basically an

industry document was developed that guides how that will be done.

MEMBER SHACK: There's a Reg. Guide that endorses that document.

MR. CARUSO: And there's a Reg. Guide that endorses it.

MEMBER SHACK: I mean, that's standard procedure.

MR. CARUSO: Right.

MEMBER SHACK: I mean, if you're not inspecting, that's really more his Case 1 back there rather than this one, I think.

MR. CARUSO: There is inspection for it, too.

MEMBER SHACK: I mean, I don't see that as a Type 1 initiative. That's a rule.

MR. DUDLEY: Well, it's certainly inspectable.

MEMBER SHACK: Yes, but I mean, I thought that would be covered under your Activity 1, would just be beyond design basis extension.

MR. DUDLEY: Oh, you mean improvement activity.

MEMBER SHACK: Improvement activity.

MR. DUDLEY: The 50.54(hh) rule would fit

in the extended design basis category. That's correct.

MR. RECKLEY: This is Bill Reckley again.

I don't have one off the top of my head for what we would do different now, but historically I can give you one that's easy. We have regulatory requirements in place for pressure boundary integrity. When the issue came up on boric acid corrosion, we accepted an industry program and did very little inspection of boric acid corrosion because of that initiative.

Had we to do it over again, that would have been a Type 1 initiative because there's an underlying requirement. We didn't do much, again. In retrospect we probably would have done more.

CHAIRMAN SCHULTZ: That's a good example.

All right. I'd like to move forward with the next presentation, which is NEI. Biff Bradley has come to provide NEI's perspective.

Just for the Committee's information, Biff has indicated he's got a hard stop at noontime, which doesn't leave him much time here, but I'm sure he'll use that time effectively.

Do you need help in drawing your slides up? Oh, there. There it is. You're ready to go.

MR. BRADLEY: All right.

MEMBER STETKAR: You just have to page through them yourself.

CHAIRMAN SCHULTZ: For the benefit of the record, Biff, go ahead and introducer yourself.

MR. BRADLEY: Sure.

CHAIRMAN SCHULTZ: And the topic as stated.

MR. BRADLEY: Biff Bradley, NEI.

And I appreciate the opportunity present. I guess by definition I'm going to be brief, but I'll try to step through this. I want to respond a little bit to some of what I've heard today.

So go ahead to the next slide.

Industry has done a good job in communicating their thinking on Recommendation 1. They've shared a number of versions of drafts, draft papers. They've devolved the approach. They've come up with various sets of options, and I just want to compliment the Staff on the effort they've made to be open and communicative about this.

The latest draft we received ins dated May 14th, and I'm commenting on -- the comments we're providing here are based on that. There were earlier versions out there as well.

Next slide.

NRC has consistently in both NTTF Recommendation 1 itself and every evolution of this white paper has noted that there is on substantial nexus to safety for this activity. I just want to note that because some of the discussion I heard today seemed to suggest there was some hypothetical safety benefit to a PRA requirement.

I would note that that has not been brought out, discussed in any of the papers we've received from the staff. so as I understand it, based on everything we've gotten in writing, the Staff continues to believe there's no substantial safety nexus to the approach. I just wanted to note that.

One thing the Staff has improved was the problem statement. I think there was a lot of comments from stakeholders to the effect that the problem statement needed to be better articulated. Well, they've made an effort at that.

I think the problem statement still, if you look at it, how much effort it justifies is arguable, given that it is a limited problem statement. It's not what I would consider a significant problem that's identified.

Something that's come up to a great degree

since this activity started has been the cumulative effects effort, and both the NRC and industry and other stakeholders are engaged now in a process to make sure that the activities we're working on are safety focused and that we're prioritizing the most safety important activities at the plants using the finite resources that we have.

I think this activity has to be viewed in that light and our written comments discuss that. And this has really evolved since the original proposal of NTTF. However, this is not immune from the same scrutiny that everything else should get with respect to cumulative effects.

We believe and have stated in our written comments, that we believe any framework changes should be limited. One, there's a whole litany of beyond design basis and severe accident regulatory activity underway now, rulemakings, orders, et cetera. I even have a list later in my presentation, that is essentially scratching the itch of this effort in terms of looking beyond the current design basis and identifying all of the new areas we need to bring into the regulatory envelope.

There was a lot of discussion of the Regulatory Analysis Guidelines. That's NUREG BR0058.

I would suggest you actually read the document, and I think NRC may have understated today the rigor of that analysis and that approach. It does include quantitative and qualitative aspects.

Just a point of reference. The regulatory analysis for the Part 26 rulemaking was 472 pages in length.

The other thing, there was a lot of discussion of stability or predictability, the need to somehow avoid the need to react to future events, et cetera, and obviously that will never be achieved with any framework. The world is a reactive place, and we will react to the events that happen.

NRC can evoke adequate protection. That's a term that does not have a definition, and NRC through a long legal history has maintained the ability to invoke adequate protection as they see fit irrespective of cost benefit, and that will be maintained in any framework that goes forward.

So just a note that the idea or concept of an entirely predictable framework is really not achievable, given that aspect.

Next slide.

Just a quick diagram showing the current framework. I think a lot of times there's a lot of

confusion between design basis and licensing basis, and in fact, yeah, the plants do have a deterministic design basis to a stylized accident, et cetera, but the licensing basis over the years has gone way beyond the design basis, and there was some discussion of that today.

I mean, a lot of the rules that are beyond design basis like ATWS, SBO, others, are already part of the licensing basis, and in terms of inspectability, enforceability, what have you, they're exactly the same as something that's in the design basis.

So I think we need to be a little more careful with some of the terminology that we're using here.

The other thing I would note is that as we move forward with all these new rules that we're developing now, the licensing basis is going to extend all the way to the far right of this figure, even encompassing the severe accidents. So we're going there right now with the post Fukushima regulatory activity. So this will look different or arguably looks different now.

Next slide.

These are the major elements of the

Recommendation 1 proposal. We're all familiar with those. So why don't we go to the next one?

This is the one I was alluding to earlier. There's a tremendous amount of regulatory activity right now aimed at addressing insights from Fukushima, and as you note, practically or actually all of these are beyond the design basis, but NRC's moving forward to establish a regulatory footprint in all of these areas. So as you can see, there are a lot of activities.

Many of are interrelated, and it's a very challenging aspect of this, is that extended loss of power, severe accident capable events, all of these things tend to have some interrelation to each other, and what we believe is there's a need for a more comprehensive, cohesive look at all of these sets of requirements to make sure that they are consistently and appropriately put into place.

And I think there's a little bit of that missing from the current activities. They tend to be siloed to some degree.

So if you go to the next slide, with respect to our needs, with respect to everything going on right now, we are in need of a better understanding, definition, clarity with respect to

regulatory treatment once we get beyond design basis or severe accident space, and how all these rules integrate. We've put some of this into our written comments on the various rules, such as the SAMG rule or the ELAP rule.

Regulatory treatment, there was some discussion of this in the NRC slides. There are a whole list of aspects of regulatory treatment that we can from QA to configuration control to anything else you can -- maintenance rule. It's a long, long list of these things, and there needs to be some consideration of how all of these things will apply once you go forward out of where we are now in the severe accident space, and it's a different world out there. the uncertainties are much larger. These are low route and low probability space where we don't have designed in redundancy, things of that nature.

So we need to be careful to balance all of this, and I'll give you an example. Recommendation 8, operator training, you know, operators have a finite amount of training, and how much of that you want to devote to severe accidents is, you know, a challenging question because you don't want to dilute the operator's attention to the more frequent events and transience, et cetera, that they're likely to see.

Obviously, the operators under the new proposed rules, under Recommendation 8, that's going to be brought in, but you have to be careful with maintaining that balance as we go forward.

Next slide.

Getting to the specifics of the staff proposal, we're still looking. May 14th is very recent. We really haven't given it a full scrutiny from the industry, but looking at what's proposed there, I think the Staff has moved in the direction of slightly more practical solution than what had been proposed before in terms of definition versus a rulemaking.

So I think going on to the next slide, with respect to the design extension, essentially what the Staff is proposing now in this area is a definition and a policy statement, and they have spoken to the need to address regulatory treatment. So I don't think we're really too far off in our thinking from what the Staff has proposed in the May 14th paper, and we do believe that you could provide a better framework.

The need is now. This isn't really something where we need it five years from now after all these rules are in place. We really have an

immediate need for clarity and definition with respect to all of these beyond design basis or even beyond current licensing basis rulemakings.

With respect to DID, I listened to what was proposed. I guess I've been in the industry a long time, nearly I guess over 30 years, and I've seen defense in depth, you know, at the conceptual level. At the level discussed today is one thing, but when you get into the field and try to define DID on a case-by-case basis, it's very difficult, and it's really a philosophy. It's a little bit like trying to define "truth" or "beauty."

We've seen in the field DID applied in 1,000 different ways, and you know, personally I do believe there's value in more structure and clarity to DID. However, I don't believe it will ever be fully accurately clearly defined in a black and white way. You're dealing with things like unknown unknowns. It's not as simple as quantifying the known uncertainties and doing things of that nature. There are other elements that come in.

I think we have to be careful putting DID as a concept into the Regulatory Analysis Guidelines absent much more clarity on the definition. So again, it's conceptually a great thing, and I think there is

value in having more structure. I can't really speak to everything that was just proposed. However, I don't think it's a panacea.

And, you know, a good example of the DID is FLEX. We're putting FLEX in. We probably can't get a big, quantifiable benefit out of that. It's there to address known as well as unknown unknowns. You know, we're trying to put our resources into mitigation, into real safety improvement, and so, you know, I think DID does have a role in that.

I think sometimes just mitigating is better than trying to analyze something ad nauseam, and so we need to be careful with that balance. But FLEX for us, you know, was the industry's proposal, but we looked at this from a DID perspective in coming up with that approach.

Next slide.

On industry initiatives, again, we haven't really vetted the latest proposals fully with the industry yet. I don't want to comment too much. I did want to make a couple of comments on what I heard the Staff say today.

Many of the Type 2 or a number of the Type 2 initiatives that were listed, one, a number of them do now have a regulatory footprint already. An

example of that would be a shutdown risk where the industry initiative NUMARC-9106 has gotten codified into the A-4 Maintenance Rule guidance, now fully inspectable under Reg. Guide 1.160. So that's one example.

Heavy loads is also under that same regulatory umbrella.

Also, one word was left off the slide. Type 2 are initiatives for items that potentially would pass the regulatory analysis, and the word "potential" was left off the slide. In fact, many of those initiatives were pursued. There was never a regulatory analysis done. So to say that all of those would have passed the regulatory analysis, in many cases I think NRC actually -- you know, we take action because in many cases regulatory analysis is difficult or not timely or maybe it won't pass, but the industry takes the initiative to do that anyway.

I think it's slightly misleading to characterize all of those type 2 initiatives as things that would have otherwise passed the regulatory analysis thresholds.

I think we've probably oversimplified this a little bit with respect to all of these types of initiatives and everything, but I think clearly our

view is if some activity passes the regulatory threshold, whether it's adequate protection or cost justified under the Regulatory Analysis Guidelines, it should be a regulated activity, and by definition, you know, these things we do in the industry initiatives, typically something like groundwater protection, there is no regulatory aspect to that.

So, you know, I think that's a good example of an industry initiative, but if there is a regulatory case to be made and you can pass those guidelines. you know, I don't understand why that wouldn't be just the process NRC would follow.

Finally, my conclusions, and it's high noon here. We do believe there's some value in the limited approach that the Staff described in their latest paper. We're still reviewing the remainder of that, and I do think, again, you know, we can't escape the same scrutiny that everything else is going through now. We have finite resources at the sites. We're trying to put those into hardware changes, real tangible mitigation, safety improvements. How much of that, you know, we would potentially want to distract with some kind of exhaustive analysis to look for things we may not have found, you know, I think is a debatable question.

Given the history we've had, PRA is a great tool, and by the way, some of the discussion makes it sound like we don't have PRAs. Every site has very good PRAs. Scopes are growing pretty much to the extent that the infrastructure is capable of supporting right now. Internal events is done. We pretty much meet the standard across the board. We have fire being developed pretty much as fast as we can for 8.05 as well as other applications.

Even seismic PRA post Fukushima, it was recognized by the Staff you can't do that all at once. It has to be sequenced out. There is an infrastructure limit on our ability to do this stuff. So we've got to be practical in considering, you know, is that the right thing to do or is it better just to go try to apply some DID and fit the improved safety in a tangible way.

So I think that will end my comments. I'll take any questions.

CHAIRMAN SCHULTZ: Any questions by the Committee?

Biff, I presume that the industry and NEI will be provide comments as part of the public comment period.

MR. BRADLEY: Yes, of course we will, and

again, you know, I appreciate the discussion today.

It was interesting, and I heard things here that I didn't necessarily see in the papers that have been provided so far.

CHAIRMAN SCHULTZ: Well, thank you very much for your participation.

MR. BRADLEY: Thank you.

CHAIRMAN SCHULTZ: Do you have a comment, John?

With that I'd like to open up the discussion to public comments, and I'll do that by recognizing Ed Lyman from the Union of Concerned Scientists. He indicated he's like to make a comment.

And at the same time, Hossein, if we can open up the Bridge Line so that anyone on the Bridge Line could make a comment as well.

Ed, why don't you begin?

MR. LYMAN: Thank you.

This is Edwin Lyman from the Union of Concerned Scientists. I appreciate the opportunity to speak on this issue.

I came here today to reinforce our organization's strong support for the concept of Recommendation 1, as was articulated by the Near-Term Task Force. We were concerned that both the industry

and the Staff maintain the view that the so-called no action approach would actually be not doing nothing, but would be doing something by continuing along the path of all the various initiatives to address severe accidents that are ongoing.

However, we think in this case the no action alternative is actually doing nothing with regard to what the task force envisioned, which was an attempt to create a unified framework and avoid the continued addition of patches to the patchwork quilt, and if we just proceed along the path that we're going, then you're just going to be creating larger and larger patchwork.

And so to that extent, I think I agree with what I just heard from Mr. Bradley, that the variety of initiatives that are being undertaken by not dealing with Recommendation 1 first, as the task force had envisioned, we are proceeding along the path where you have a variety of different activities with potentially different definitions, and it's not clear they're all consistent.

Is reasonable protection of equipment under the mitigating strategies order consistent with what -- of the capability of the severe accident capable event, for example, and the protection that

would be required for a severe accident capable? It's not clear they're consistent.

So I think Recommendation 1 would provide an opportunity for the unification consistency of these different inferences.

If the Commission continues to put off doing something about this, it will continue a very long tradition of not dealing with this issue. If you go back to the early 1980s, and I thought Mr. Johnson was going to be talking about this at the beginning, but he went in a different direction, there was a degraded core rulemaking, advanced notice of proposed rulemaking for degraded cores.

If you go back and read that advanced notice in the *Federal Register*, you realize that a lot of these issues were raised at that time. What happened historically was the industry came up with its E-CORE (phonetic) Program, managed to convince the Commission that these were low probability events that didn't require being addressed.

Then you have the severe accident policy statement which declared by fiat that operating reactors were safe and you didn't need to consider generic changes for severe accidents, and that led or that contributed to the patchwork situation you have

today. You went through the IPs, the IPEEEs, which were not done in a consistent basis because there was no unifying theme or template for all the inconsistencies to be -- and so the value of those reviews is limited because they were not done on a consistent basis.

So, you know, we're here, again, to urge the staff to adhere more closely to what the Near-Term Task Force proposed, and to that extent I'm pretty disappointed with a lot of the decisions that seem to have been made at least with regard to the improvement activity in number one. Like I said, you made the wrong decision on almost every call.

The thing I'm most concerned about is the idea that you would grandfather; you would add events to the extension category and grandfather them. It seems that is not dealing with the issues that we discussed where you want to at least contemplate the fact that there would be changes to some of the requirements based on putting them in a category presumably grouped by some sort of consistent criteria.

So just by changing the name of certain initiatives to call them design basis extension events without addressing the criteria is just relabeling.

You're not actually doing it.

The other major concern along those lines is the idea that you would use existing regulatory guidance to evaluate these new events. That doesn't make sense to me. If you're going to have a consistent approach, you want to look at the regulatory guidance. You want to revise the regulatory guidance in accordance with your new criteria for how you're going to be judging the importance of these various events, and then you judge the events with regard to the new criteria.

So just take one example. Every utility that has applied for license renewal has had to do SAM analysis. This is a NEPA activity. It doesn't force them to actually make any changes, but they have to go through a litany of changes for severe accident mitigation and evaluate whether there is significant or substantial safety improvements and whether they're cost justified.

You use the regulatory analysis for SAMA based on the current criterion. If you look at how the PRA is used in SAM analysis, in many cases where there's no external events PRA or seismic PRA, you just use a multiplier on the internal events PRA. So you're not recognizing or acknowledging unique

external event vulnerabilities that might not scale the same way internal event vulnerabilities do.

So just take, you know, a very simple example. If you were to make a proposed change by increasing the seismic resistance of a particular licensee, if your PRA doesn't have the seismic component, then you're changing -- your delta CDF is going to be zero.

And so when you're thinking about the application of regulatory analysis, think about how it's being used in that kind of context.

Another point is do you use mean values or do you use another statistical parameter to make your value judgments. Is the use of mean values the right one to capture the right level of uncertainty?

So, for instance, if you look at Fukushima, we know that there was a concentrate plume of radioactivity to the northwest that occurred because the particular release coincided with a particular meteorological condition that led to that increased contamination. Would that be captured by the kind of mean value analyses that are done in a SAMA or a backfit analysis when the MAX-2 code is used to generate mean values over meteorological conditions?

You would miss that. You would not capture those kinds of outliers. So you merely think you need to change your regulatory analysis first and then evaluate the significance of or what you need to do to really make a significant safety improvement with regard to severe accidents.

So in that regard I agree when the Staff says their Improvement Activity No. 1 is not going to make a difference with regard to safety. I agree with that, but I think that's because they made the wrong choices in some of their decisions.

So I think I'll stop there. Thank you.

CHAIRMAN SCHULTZ: Thank you for your comments.

Are there any other comments of members of the audience in the room before I turn to the Bridge Line?

(No response.)

CHAIRMAN SCHULTZ: Seeing no one come forward, I'd like to turn to the Bridge Line. Are there members of the public who would like to make comments at this point? Now is the opportunity.

MR. LAUER: Yes, this is Steve Lauer, a member of the public. I'm a member of NRC NRR, Division of Risk Assessment.

CHAIRMAN SCHULTZ: Thank you, Steve.

MR. LAUER: I'd just like to note one thing. The NTTF Task Force was commissioned by a Staff requirements memorandum to take a quick look, a 90-day look to determine whether there were potential vulnerabilities at U.S. sites as a result of considering what happened at Fukushima.

The SRM recognized that there would be a longer term phase that would carefully look for the lessons that would be incorporated or should be incorporated into the regulatory structure.

The NTTF Recommendation 1 Working Group, which I'm a part of, has had the benefit of the NTTF report, the Risk Management Task Force report, and we've had access to the members of both of those task forces. We've had access to information that was not available to the NTTF. We've deliberated for over 18 months. We've interacted with management and the JLD Steering Committee.

I do not believe that the NTTF recommendations should be taken as givens, but rather should be considered on their merits. The proposed improvement activities that we propose are consistent with the principles of good regulation and should not be judged solely based on whether they meet the intent

of the Near-Term Task Force.

Thank you.

CHAIRMAN SCHULTZ: Steve, thanks for the perspective.

Are there other members of the public who would like to make a comment at this time?

(No response.)

CHAIRMAN SCHULTZ: Hearing none, we're going to close the Bridge Line and go to the next item on the agenda, which is the path forward and schedule. Dick, you were going to present that.

MR. DUDLEY: Okay. And this is just going to be a rehash. It's going to be real quick.

I'm going back to Slides 4 and 5.

As you know, our May 15 white paper with the recommendations that we described today, essentially the same, is publicly released. There's a public comment docket open on regulations.gov. We're accepting comments until August 15th on that docket.

I want to make sure everybody in the public is aware of a public meeting coming up on June 5th. the meeting notice went out probably this morning for us. After this meeting, we'll assess ACRS feedback. We'll assess external feedback from the

public meeting in June and internal feedback from management and others, and we'll revise and update the white paper, and we'll issue a fourth version in August.

And as I said, we'll use that paper to meet with the ACRS for their meeting on September 3rd.

Let's go to the next one.

We'll prepare the SECY paper. We'll have another Subcommittee meeting followed by full Committee meeting in November, and we will provide our SECY paper to the Commission by December 2nd.

Are there any questions on the schedule or comments?

CHAIRMAN SCHULTZ: I'm just looking for the SECY paper. So on the slide before, the meeting for us in September is going to be on September 4th, I believe.

MR. DUDLEY: September 3rd.

CHAIRMAN SCHULTZ: Okay.

MR. DUDLEY: September 3rd.

CHAIRMAN SCHULTZ: That's correct.

MR. DUDLEY: I believe that's the date.

CHAIRMAN SCHULTZ: That's when we talked we might have an opportunity to expand the discussion to look at the regulatory framework as well.

MR. DUDLEY: You have given us some things to think about, and at that meeting we'll respond to the issues that you've raised.

CHAIRMAN SCHULTZ: Dick, in going forward beyond the public comment period, are there other opportunities for public meetings that are on the agenda?

MR. DUDLEY: We haven't decided. We may have time to schedule a fourth public meeting. We're going to decide. We'll have the meeting on June 5th, and we'll see what the interest is.

CHAIRMAN SCHULTZ: Good.

MR. DUDLEY: Also, the decision to have another public meeting would be affected by how substantially the paper changes from the version that's public now and will be discussed at the public meeting on June 5th.

We haven't made that decision.

CHAIRMAN SCHULTZ: Okay. Thank you.

First, I'd like to thank you, Dick and Mary and Dan, for your presentations this morning. they're been very informative for the Committee.

And then with that I'd like to ask members of the Committee if they have any other comments or questions they'd like to bring forward. Joy.

MEMBER REMPE: As you go forward, I heard a lot of discussion today about implementation and questions of how Activities 1 and even 2 would be implemented, and I'd like to emphasize the details of the models and the uncertainties in the models. If a little, using perhaps just to me, but some of these things could be done that are being proposed, and I would like to see the implementation focus on some of the uncertainties in the models that are being used to implement things.

CHAIRMAN SCHULTZ: At least some additional discussion in the meetings that we have with the Staff. We can work on adding that or including that in the agenda of either the September or the October Subcommittee meeting for sure.

MEMBER REMPE: And thank you again for your presentation, and I have to go to another meeting.

CHAIRMAN SCHULTZ: Charlie.

MEMBER BROWN: Yeah. I don't have any more than what I've said. I did want to make one observation that I thought the white paper that you gave us this time in preparation for this meeting, the May -- the most recent one was very helpful to me since I don't have a long, long history as background

of the NRC's regulatory framework, and so this really helped to frame your thought process relative to what you all were thinking of doing relative to this. I thought it was very good from my perspective, and I just wanted to thank you for getting that out before the meeting.

CHAIRMAN SCHULTZ: Bill?

MEMBER SHACK: No additional comments.

MEMBER RYAN: No additional comments. Steve, thanks.

CHAIRMAN SCHULTZ: John?

MEMBER STETKAR: Nothing more. Thanks.

MEMBER SHACK: Sam.

MEMBER ARMIJO: Nothing more. A very good presentation; well prepared; good white paper.

MEMBER BLEY: I enjoyed the discussion. I guess I just want to reiterate. You know, Activity 2, I'd really like seeing this get organized. This is the third attempt I recall at trying to get our arms around defense in depth in a meaningful way, and I'd like to see that make it.

Activity 1, I'm a little unsettled with it, as I said, and I don't know how you make some of the decisions you're trying to make without PRAs, and as we've heard, at least to some extent there are PRAs

all around at all the plants that could let them address some of these issues.

CHAIRMAN SCHULTZ: And Dick?

MEMBER SKILLMAN: No, thank you.

CHAIRMAN SCHULTZ: All right. I'd like to close the meeting, again, with the comment related to the progress that has been made on this project.

The group has done a good job over the past several months now both in framing the issue at first and then now, as we've seen -- Charlie mentioned it -- in focusing the issue as we've gone forward. We're really looking forward to the public comment period, and we'll be working with you to examine those public comments before we come to our next meeting. We'll look for that opportunity.

Appreciate that very much and look forward to the next Subcommittee meeting. With that I'll close the meeting.

(Whereupon, the proceedings went off the record at 12:19 p.m.)

Fukushima Near Term Task Force (NTTF) Recommendation 1: Improved Regulatory Framework

NRC Staff Presentation to the Fukushima Subcommittee of the Advisory Committee on Reactor Safeguards

May 23, 2013

Outline of Presentations

- Overview of Recommendation 1
  - Review actions taken and planned
- Improvement Activity 1 – Establish a design basis extension category of events and associated regulatory requirements
- Improvement Activity 2 – Establish Commission expectations for defense-in-depth
- Improvement Activity 3 – Clarify the role of voluntary industry initiatives in the NRC regulatory process

Evolution of NRC Approach

- In August 2012 ACRS meeting – Described 12 potential framework improvement activities
- In December 2012 ACRS meeting - Four options
  - Described in Nov. 2 white paper (ML12296A096)
- Today we will discuss three improvement activities
  - February 2013 white paper describing different ways to implement improvement activities (ML13053A108)
  - May 15, 2013 updated white paper with working group's recommended approach (ML13135A125)

Status and Next Steps

- NEI regulatory framework comments on NRC's Feb. 2013 paper were submitted April 30, 2013
- Public comment period on NRC's May 15, 2013 white paper (www.regulations.gov) opened on May 16, 2013 – closes on August 15, 2013 (Docket NRC-2012-0173)
- 3rd public meeting on June 5, 2013
- Staff will further update white paper (4th) in August 2013 to address ACRS, external, and internal feedback from JLD Steering Committee
- Provide 4th white paper to ACRS to support subcommittee meeting on Sept. 3, 2013

Status and Next Steps (cont.)

- Prepare SECY paper; provide to ACRS mid-Sept. 2013
- ACRS subcommittee meeting on Oct. 18, 2013
- ACRS full committee meeting on Nov. 7 & 8, 2013
- Receive ACRS letter Nov. 13, 2013 (if possible)
- Evaluate ACRS comments; modify SECY as appropriate; get management approval; and provide paper to Commission on Dec. 2, 2013

Improvement Activity 1

Establish Design Basis Extension Category

Improvement Activity 1

Establish a design basis extension category of events and associated regulatory requirements

- NTTF & RMTF recommended rulemaking to establish a new category for beyond design-basis requirements
- WG evaluated 3 approaches to establish new category
  - Approach #1 - Plant-specific approach with required PRA
  - Approach #2 - Plant-specific approach without required PRA
  - Approach #3 - Generic approach (without required PRA)
- WG recommends modified version of Approach #3

Categorization Approach Involves 2 Activities

1. **Define category**

2. **Identify requirements** (rules and orders) that go into the category

Working Group Recommendation

- Define a generic design basis extension category in internal staff guidance
- Populate the category – forward-fit only
  - New issues/information/rules

Activity 1 – Establish New Design Basis Extension Category

- NRC regulations already include a de-facto design extension category
  - e.g., SBO, ATWS, 50.44, 50.54(hh)
  - 50.46a, risk-informed GSI-191 rule, & Fukushima rules
- Rulemaking is not required to establish a new category of events (although recommended by NTTF and RMTF)

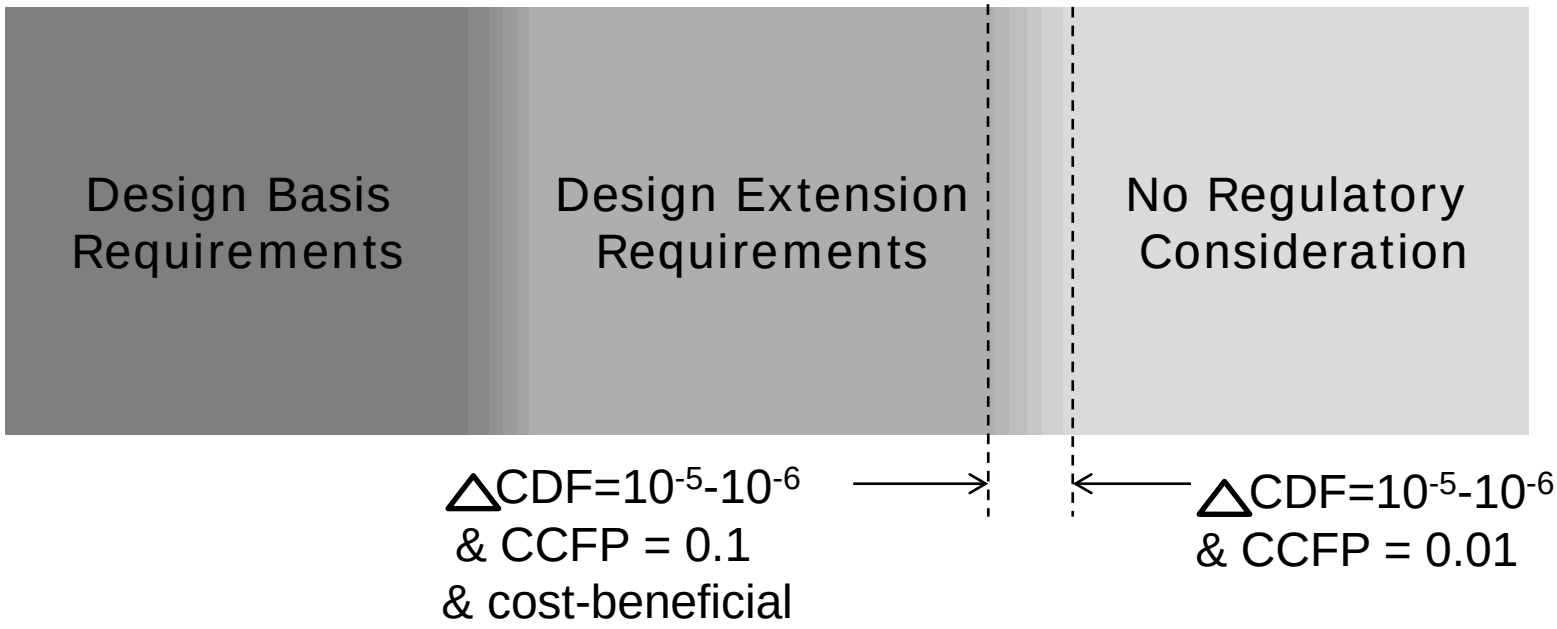
Contents of Staff Guidance

- Define “Design basis extension conditions (events and hazards)”
- Specify how to write future requirements (regulations and orders) to ensure they are consistent, coherent, and complete
  - Well-defined performance goals
    - Analysis methods & acceptance criteria
  - Treatment requirements
    - Design criteria, availability, testing requirements, QA/QC, training
    - Internal guidance would also provide general guidelines to assist staff in determining treatment requirements
  - Reporting requirements, including FSAR updating
  - Change process
    - Specify appropriate change processes (if § 50.59 not applicable) for licensee-initiated changes to SSCs utilized to comply with design extension requirements

Recommended Criteria for Inclusion in Category

Criteria for including requirements in design basis extension category:

- Adequate protection (determination not affected by this category)
- Safety enhancement - Use existing criteria in Reg. Analysis guidelines (NUREG/BR-0058, Figure 3.2)



Identify Design Basis Extension Requirements

- "Grandfather" SBO, ATWS, 50.44, 50.54(hh), etc. as design basis extension requirements
- Add ongoing/future design basis extension rules
  - 50.46a, risk-informed GSI-191 rule, Fukushima rules
- Working Group recommends not searching for additional events (NTTF Recommendation 1.4) because:
  - Ongoing rulemakings (mitigating strategies rule) and NTTF Recommendations 2 – 11 will address and investigate a wide range of safety concerns for needed safety improvements
  - NRC has processes that generically address new issues as they arise (generic issues program, ROP, petition for rulemaking process, etc.)
  - Existing plants have performed IPE and IPEEE studies
  - New reactors are required to have plant-specific PRAs
  - Current NRC resource limitations

Summary of Recommended Approach

Design basis extension category which:

- Is generic
- Addresses requirements needed for adequate protection and those justified as a cost-effective substantial safety enhancements
- Does not require a plant-specific PRA
- Is applicable to current and future licensees and applicants
- Specified existing requirements “grandfathered” without change
- Applies only to new/additional design basis extension requirements
- Can be implemented on ongoing Fukushima rulemakings
- Low cost for NRC and licensees

Improvement Activity 2

Establish Commission Expectations for Defense-in-depth

Purpose of Presentation

- To illustrate the approach to demonstrate there is a reasonable likelihood of success in developing policy statement on defense-in-depth and associated implementing guidance
- Not to debate the terminology or wording
  - Discussion on terminology and wording will be pursued once concept/approach is established
  - Examples are provided to clearly communicate the concept and approach

Basis for Addressing Defense-in-Depth as an Improvement Activity

- To achieve consistency in concept, approach and terminology in order to achieve a common understanding regarding defense-in-depth
- To have Commission approval regarding defense-in-depth concept, approach, and structure

Background – A Sample of the History

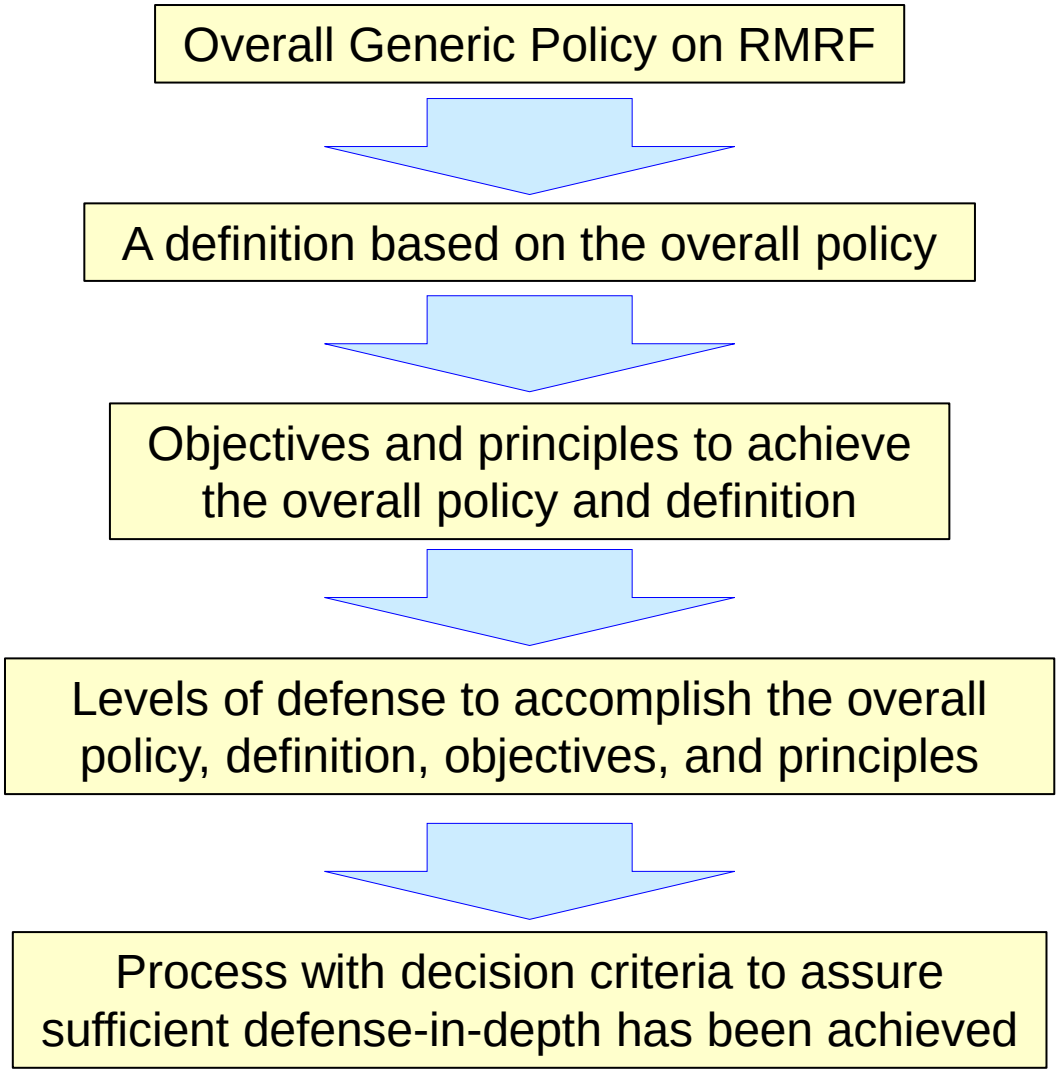
- WASH-740, 1957
- Joint Committee on Atomic Energy Hearings
- Internal Study Group
- ECCS Hearings
- WASH-1250
- 10 CFR Part 60
- Post TMI Definitions and Examples
- NUREG/CR-6042
- Commission Policy Statements
- NUREG-1537
- MIT Speech by Chairman Jackson
- Commission White Paper
- Some Thoughts on Defense-in-Depth by Tom Kress
- PSA '99 paper
- ACRS letters
- IAEA Documents (INSAG-3, 10, & 12, NP-T-2.2)
- 10 CFR Part 50, Appendix R
- Joint ACNW/ACRS Subcommittee
- A Risk-Informed Defense-in-Depth Framework for Existing and Advanced Reactors, Karl Fleming, Fred Silady
- 10 CFR 50.69
- NEI 02-02
- Petition on Davis Besse
- Remarks by Chairman Diaz
- Digital Instrumentation and Controls (NUREG/CR-6303, RG 1.152, NUREG-0800 BTP HICB-91, NUREG-0800 SRP BTP 7-19, DI&C-ISG-02)
- NUREG-1860
- INL NGNP report
- RG 1.174
- NRC glossary
- RMTF – NUREG-2150, 2012

Evaluation of History

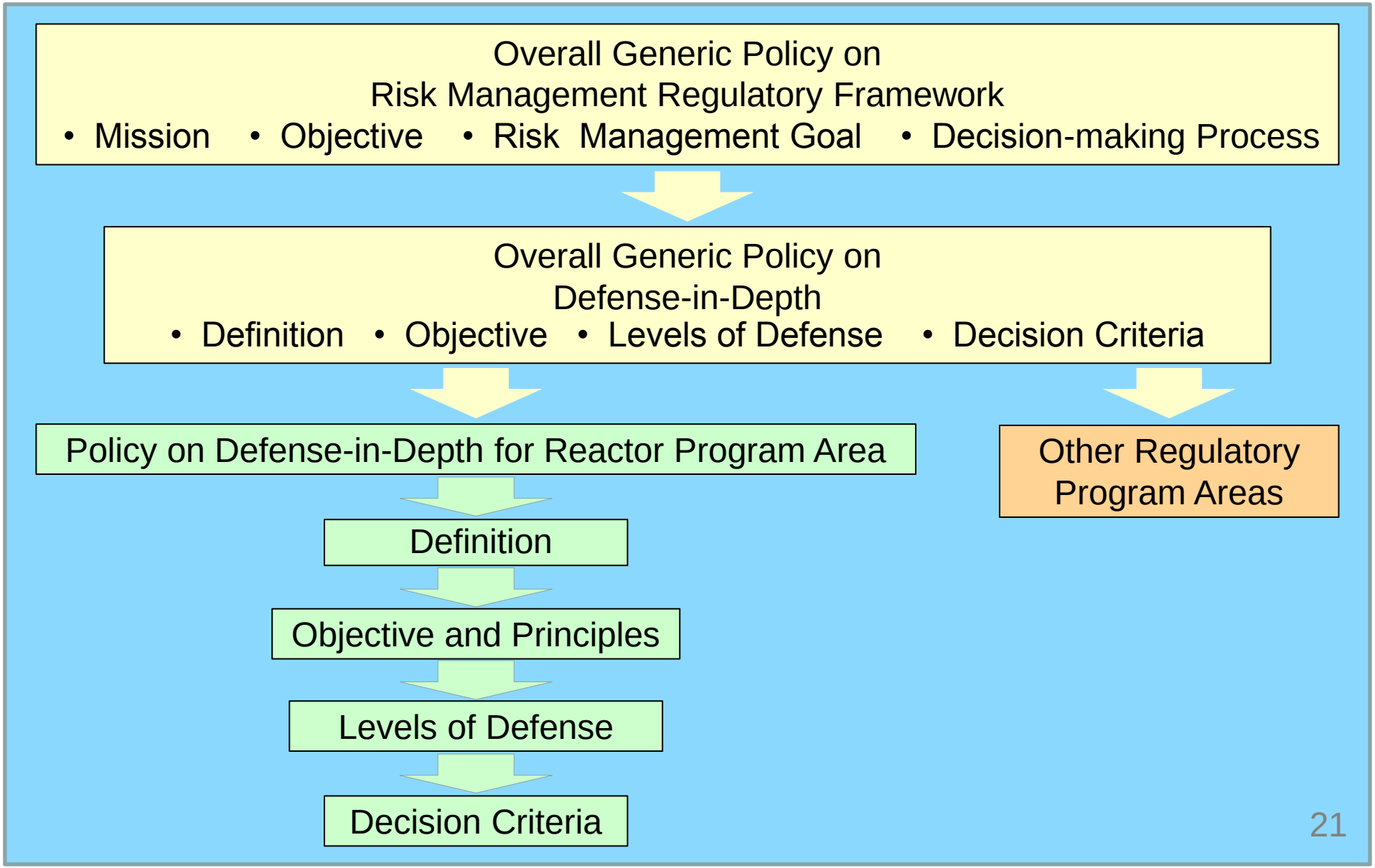
- Similar concepts and views regarding defense-in-depth
- Confusion and misunderstanding because of inconsistencies in terminology

Working Group Approach to Defense-in-Depth

- Policy on defense-in-depth will be developed in a logical, systematic manner to achieve consistency in the treatment of defense-in-depth across the agency
- Defense-in-depth approach will be based on a hierarchical structure



Example of RMRF Proposed Policy Statement



Example Policy and Definition for Reactor Safety Described in the Policy Statement

- **Example Policy:** A defense-in-depth approach is used to provide reasonable assurance of public health and safety from the operation of the reactor of a nuclear power plant.

- **Example Definition:** Defense-in-depth is a strategy that employs successive levels of defense and safety measures in the design, construction and operation of the nuclear power plant to ensure appropriate barriers, controls, and personnel are in place to prevent, contain, and mitigate exposure to radioactive material.

Example Objectives and Principles for Reactor Safety Described in the Policy Statement

Example Objectives and Principles: keep the risk to the public from the operation of the reactor of a nuclear power plant acceptably low by

- Compensating for uncertainties, including events and event sequences which are unexpected
- Making the nuclear power plant more tolerant of failures and external challenges

By implementing the following **example** principles:

- Key safety functions are not dependent upon a single element of design, construction, maintenance or operation
- Uncertainties in SSCs and human performance are accounted for in the safety analysis and appropriate safety margins are provided
- Application of conservative codes and standards
- High quality in the design, construction, and operation of the nuclear power plant
- System redundancy, independence, and diversity are part of the design and operation
- Defenses against potential common-cause failures are part of the design and operation

Example Levels of Defense and Decision Criteria for Reactor Safety Described in Policy Statement

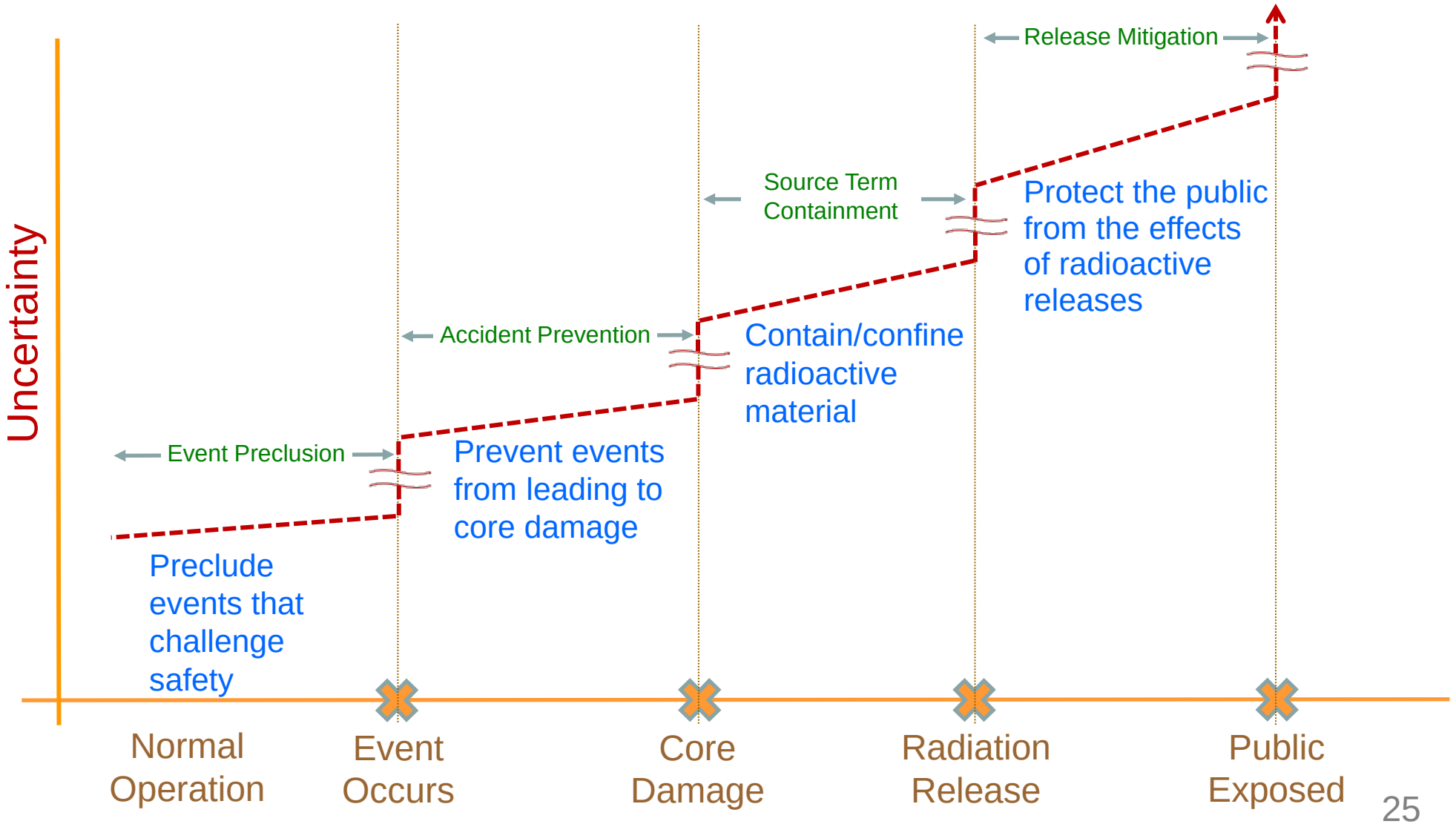
Example Levels of Defense: defense-in-depth is comprised of four successive levels of defense where each level's defense measures are applied if the previous level fails

- Event preclusion – safety measures that preclude events that could challenge safety
- Accident prevention – safety measures that prevent events from progressing to core damage
- Source term containment – safety measures that prevent radioactive release from the containment
- Release mitigation – safety measures that protect the public from the effects of radioactive releases

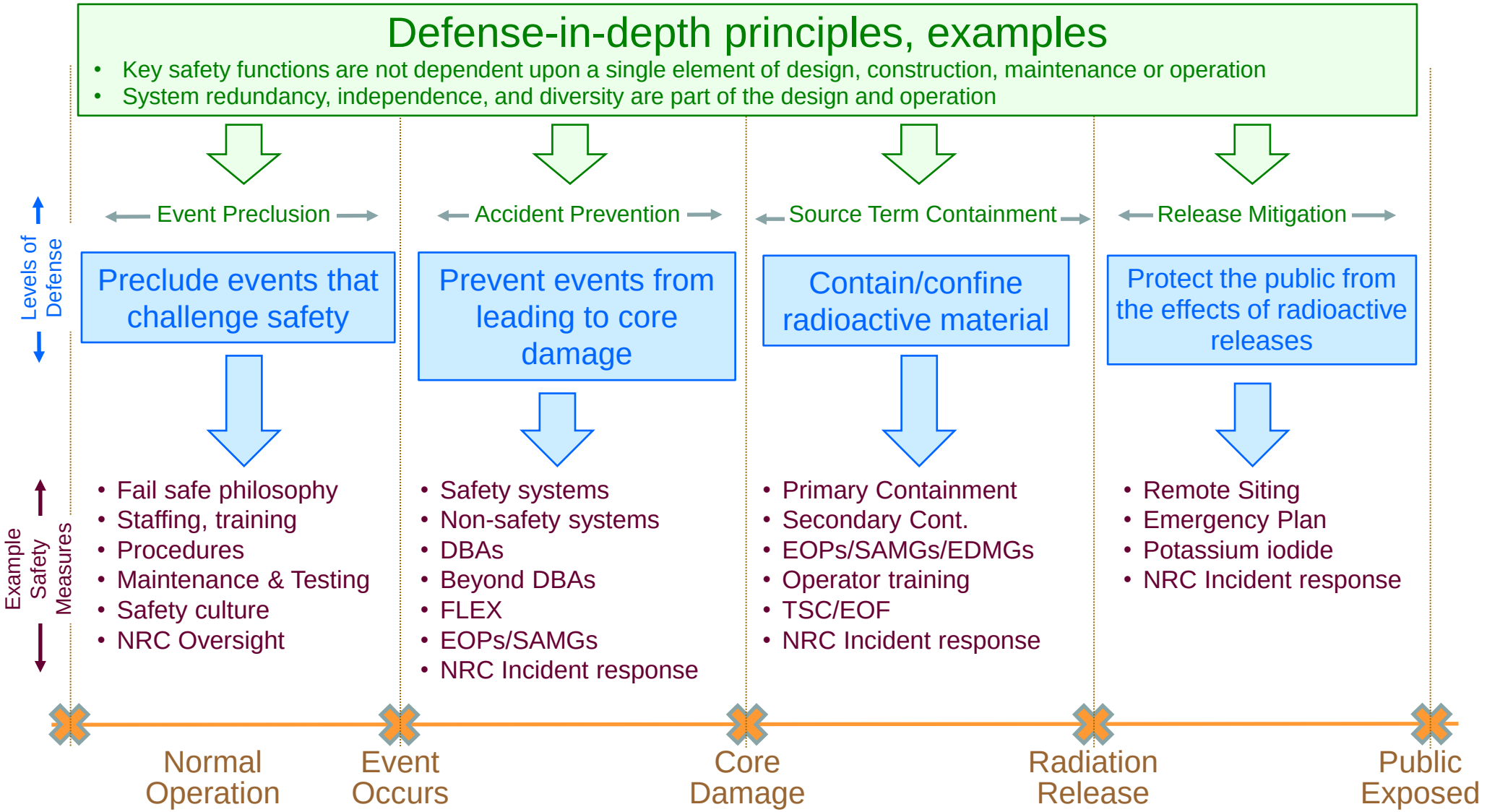
Example Decision Criteria:

- DID objective
- Safety margins
- Monitoring
- Overall risk
- Levels of defense
- DID principles
- Levels of defense safety measures
- Significance of uncertainties
- Quantitative acceptance guidelines

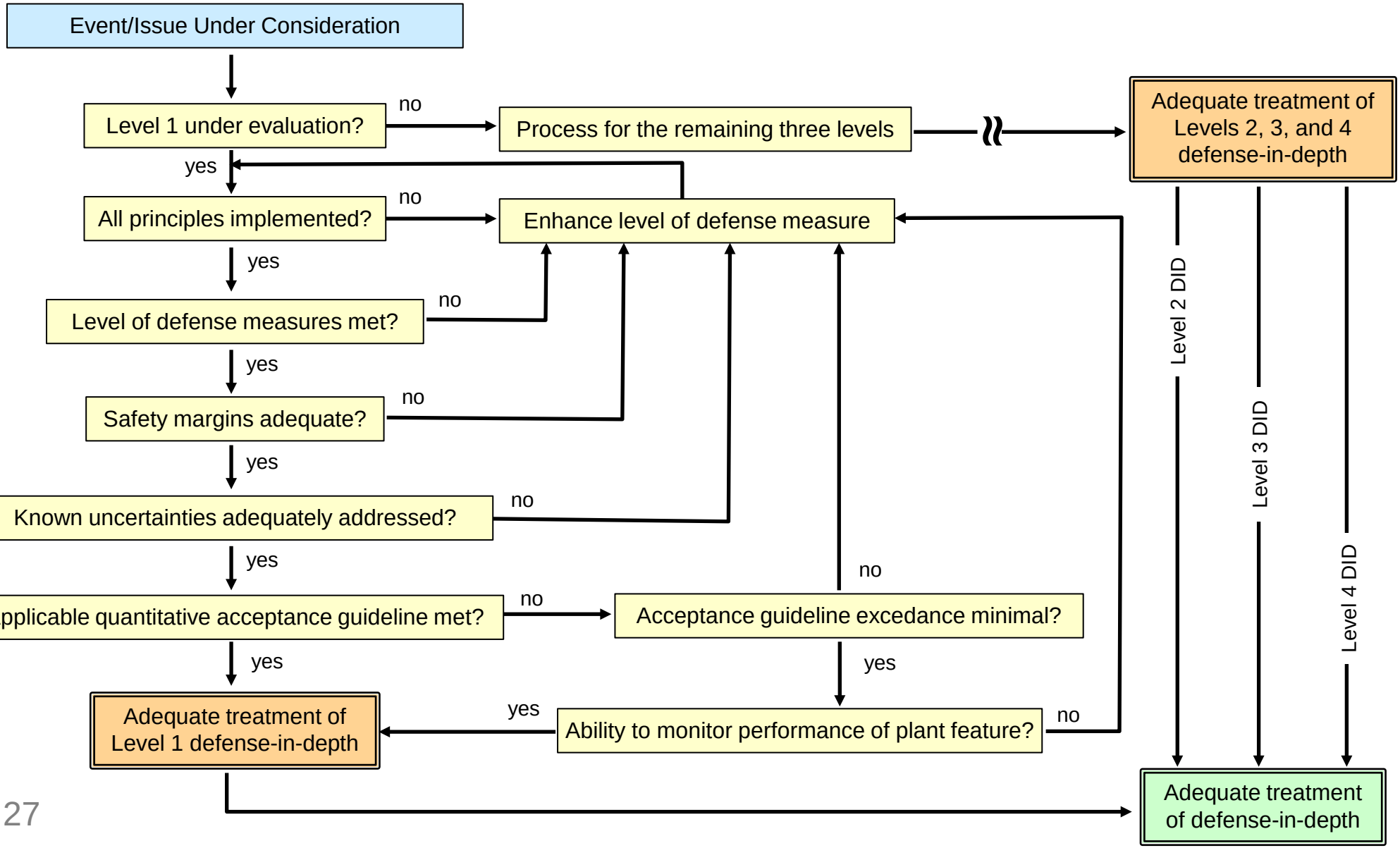
Nuclear Power Reactor Defense-in-Depth Consists of Four Levels, Defined by a Step Increase in the Uncertainty at Each Accident Sequence Stage



Examples of Reactor Safety DID Principles and Implementation Safety Measures for each Level of Defense



Draft Example Decision Process



Improvement Activity 2: Establish Commission Expectations for Defense-In-Depth

Key Decision	Options
Require Plant Specific PRA?	❑ Yes ❑ No ✓ **No, but use plant-specific risk insights as available**
Applicability? (licensed entities)	❑ Future licensees and applicants ✓ **Current and future licensees and applicants**
Forward looking or retrospective (issues)?	✓ **Forward looking: applies only to new issues** ❑ Forward looking and retrospective: applies to future issues and could also be used to identify need for additional defense-in-depth for currently operating plants

Relationship Between NTTF and RMRF

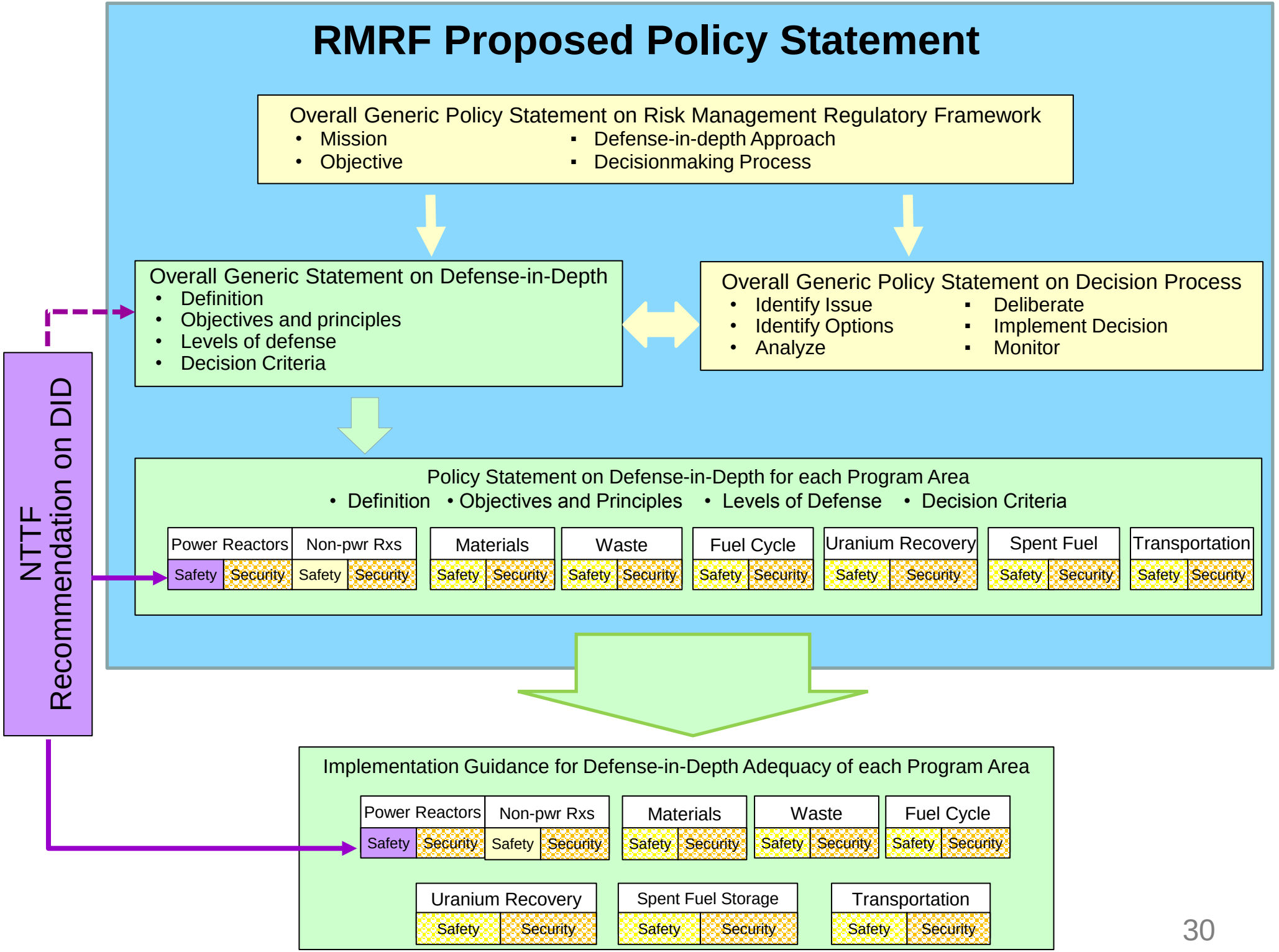
- NTTF working group (WG) providing recommendations for addressing:
  - Defense-in-depth for power reactor safety
  - Process addressing BDBEs
  - Voluntary initiatives

- RMRF WG providing recommendations for
  - A draft policy statement for a RMRF to be issued for formal public review and comment
    - addresses overall agency and each program area individually
    - defense-in-depth is a major piece
  - A detailed plan for implementing the recommendations in NUREG-2150 which include addressing Beyond Design Basis Events (BDBEs)
  - ***Voluntary initiatives not part of scope***

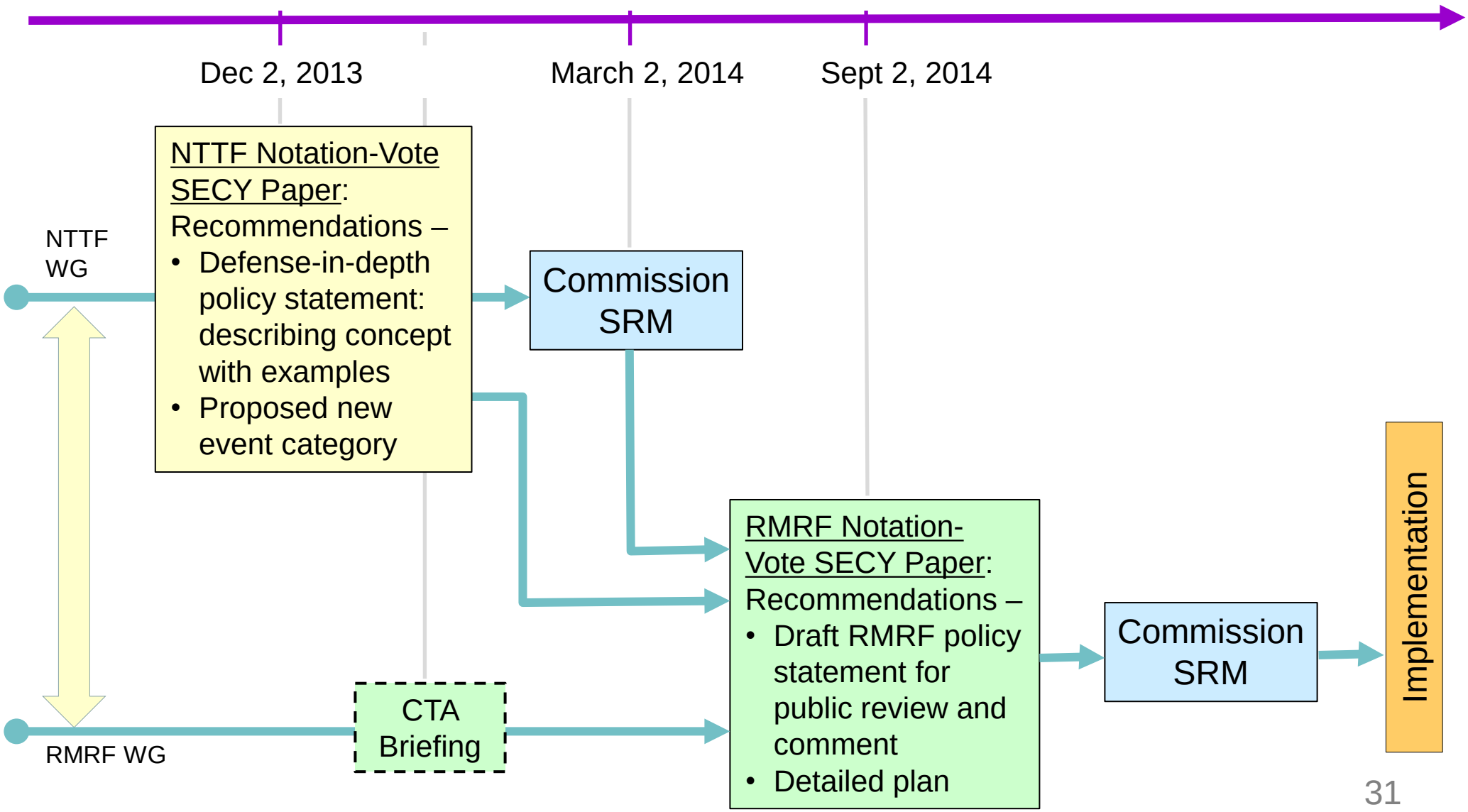
- RMRF WG will disposition RMRF recommendations for power reactors based on decisions made on NTTF Rec. 1 as guided by the Commission SRM

- Both groups working together, common staff on both groups to help ensure consistency and efficiency

RMRF Proposed Policy Statement



Relationship Between NTTF and RMRF (cont'd)



Improvement Activity 3

Clarify the Role of Voluntary Industry Initiatives in the NRC Regulatory Process

Activity 3 – Introduction

- Activity 3 would clarify the role of certain industry initiatives in NRC's regulatory processes by:
  - Re-affirming the Commission's expectation that industry initiatives may not be used in lieu of NRC regulatory action on adequate protection issues.
  - Specifying when certain industry initiatives may be credited in the baseline case for regulatory analyses
  - Providing guidance regarding what level of NRC oversight is appropriate

Activity 3 – Background

- Direction-Setting Initiative 13 (SECY-97-303) resulted in decision to develop guidelines for using industry initiatives
- SRM-SECY-99-063 stated that regulatory framework allows voluntary initiatives **except in issues involving adequate protection**
- SRM-SECY-00-0116 – directed staff to publish guidelines for using voluntary initiatives (65 FR 53050; Aug. 31, 2000)
- SECY-01-0121- Responding to overwhelmingly negative comments from public and industry stakeholders, the NRC abandons voluntary initiative program
- Fukushima Near Term Task Force Report
- Risk Management Task Force Report (NUREG-2150)

Activity 3 – Relationship to NTTF and RMTF Reports

- Fukushima Near Term Task Force Report
  - Notes that "... voluntary industry initiatives should not serve as a substitute for regulatory requirements but as a mechanism for facilitating and standardizing implementation of such requirements." The NTTF further notes that "... NRC inspection and licensing programs give ... little attention to industry voluntary initiatives since there are no requirements to inspect against."
  - Examples include SAMGs and BWR hardened vents
- Risk Management Task Force Report (NUREG-2150)
  - "The extent to which licensee activities undertaken as part of voluntary industry initiatives can be credited has been a source of contention in the Reactor Oversight Process and has reduced the efficiency of that process."

Types of Industry Initiatives

from Regulatory Analysis Guidelines (NUREG/BR-0058, Rev 4)

- Type 1: those put in place in lieu of, or to complement, a regulatory action to ensure that existing requirements are met (e.g., BWRVIP, PWR MRP)
- Type 2: those used in lieu of, or to complement, a regulatory action in which a substantial increase in overall protection could be achieved with costs of implementation justifying the increased protection (e.g., SAMGs, BWR MK-I hardened vent, Backup power for H_2 igniters)
- Type 3: those that were initiated to address an issue of concern to the industry but that may or may not be of regulatory concern (e.g., groundwater monitoring)

Activity 3 – Description

- Implement with either a Commission Policy Statement or revisions to existing guidance
- Industry initiatives may not be used in lieu of NRC regulatory action on adequate protection issues.
- Industry initiatives may not be credited in the baseline case in the regulatory analysis unless there is a high likelihood that the industry will effectively implement and maintain the initiative over time.
- Revise oversight processes (inspections, audits) to verify the implementation and effectiveness of Type 2 initiatives which the NRC believes are important from both a safety and regulatory perspective.

Activity 3 – Additional actions

- Review licensee commitments made as a result of IPE/IPEEE programs and verify that those with the highest safety significance were implemented and have been maintained.
- Modify inspection procedures to provide more oversight of the most significant Type 1 initiatives which the NRC believes are important from both a safety and regulatory perspective.

Existing Type 2 initiatives

- Low power/shutdown risk
- Severe Accident Management Guidelines
- Hydrogen igniter backup power for BWRs and ice condensers
- Industry Initiative on Underground Piping and Tanks Integrity
- Heavy load lifts
- Motor Operated valves
- Substandard Non-Safety-Related Molded Case Circuit Breakers
- Piping Erosion/Corrosion
- Station Blackout (Diesel Reliability portion)
- Oil Loss in Rosemount Transmitters
- Design Basis Programs
- Fraudulent Flanges
- Comprehensive Procurement Initiative
- Managing Regulatory Commitments
- Safety culture initiative

Activity 3 – Summary of Recommended Approach

- Develop policy statement or guidance on industry initiatives
  - Not for adequate protection issues
  - When to credit in the baseline case of the regulatory analysis
- Develop infrastructure and guidance for oversight of certain Type 2 initiatives
- Review certain IPE/IPEEE commitments
- Modify inspection procedures to provide more oversight of certain Type 1 initiatives

NTTF Recommendation 1
Industry Perspectives

ACRS Fukushima Subcommittee

May 23, 2013

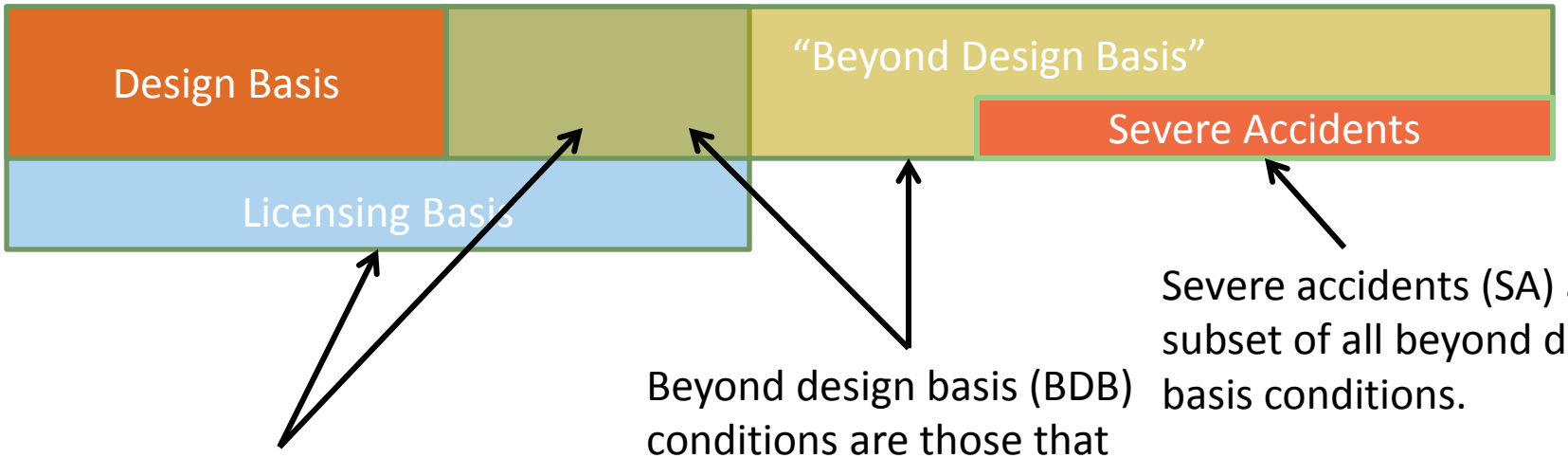
Background

- Industry has commented twice on versions of the NRC staff draft paper addressing alternatives for Recommendation 1
  - December 13, 2012
  - April 30, 2013
- This presentation addresses the latest draft NRC working group document, dated May 14, 2013

Overall Observations

- No safety basis to support framework change
- Problem statement has been better defined in response to earlier comments, but still provides limited justification
- Resource impact should be considered in light of cumulative effects
- Industry believes framework changes should be limited
  - Significant beyond design basis regulatory activity is underway now
  - Regulatory analysis guidelines appropriately consider new information and requirements
  - Adequate protection may always be invoked in any regulatory framework

Current Framework



A Plant's Licensing Basis includes, but extends outside of the plant Design Basis.

Beyond design basis (BDB) conditions are those that are outside the plant design basis. This includes both licensing basis conditions and other, more extreme conditions

Severe accidents (SA) are a subset of all beyond design basis conditions.

Recommendation 1 Elements

1. Establish a design extension category of events and Associated Regulatory Requirements
2. Defense in depth – enhanced definition and consideration in regulatory analysis guidelines
3. Regulatory Treatment of Industry Initiatives

BDB and Severe Accident Regulatory Activities

- Extended loss of AC power rulemaking (BDB)
- Filtering strategies rulemaking (SA)
- SAMG rulemaking (BDB-SA)
- Severe accident capable BWR vent order (SA)
- Reliable hardened BWR vents (BDB)
- SRM on economic consequences, reg analysis guidelines (SA)
- Recommendation 1

Industry Needs

- Consistent regulatory approach to address BDB/SA rulemakings, orders, etc.
- Integration of existing BDB and SA rulemakings with respect to content, schedule and approach
- Definition and consistency of regulatory treatment for BDB and SA considerations
- Proper balance of DB, BDB and SA expectations and regulatory treatment with respect to likelihood

Design Extension Category

- Industry did not support design extension approach in our comments
- Latest staff draft position (May 14) is under review
- Design extension is proposed as definition
- Define new category, but no rulemaking
- Prospective versus retrospective
- Generic versus plant-specific
- Address NRC policy, guidance and procedures

Design Extension Category

- If timely, a policy statement on BDB/SA regulatory approach and integration could address industry needs identified on slide 7
- Could provide framework for better BDB/SA rule integration, consistency and approach

Defense in Depth

- NRC proposes Commission Policy Statement to establish definition, objectives and principles of DID
  - DID is a philosophy
  - Experience suggests the term can never be fully defined and clarified
  - Potential inclusion in regulatory analysis guidelines problematic absent clear definition

Industry Initiatives

- Not prepared to comment on categories recommended in latest NRC paper
- By definition, industry initiatives address issues that do not reach the level of regulation
- Basis for a regulatory footprint on industry initiatives is therefore not clear

Conclusions

- Value in limited approach to Recommendation 1 to establish regulatory treatment considerations BDB/SA
- Other elements of proposal are under review, but were not supported by our written comments
- Cumulative impact if this activity should be considered given lack of safety basis