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

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

DIGITAL INSTRUMENTATION & CONTROLS SUBCOMMITTEE

+ + + + +

TUESDAY

APRIL 16, 2019

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2-D10, 11555 Rockville Pike, at 8:30 a.m., Charles H. Brown, Jr., Chairman, presiding.

COMMITTEE MEMBERS:

CHARLES H. BROWN, JR., Chairman

PETER RICCARDELLA, ACRS Chairman

MATTHEW W. SUNSERI, ACRS Vice Chairman

JOY L. REMPE, ACRS Member-at-Large

RONALD G. BALLINGER, Member

DENNIS BLEY, Member

JOSE MARCH-LEUBA, Member

GORDON R. SKILLMAN, Member

DESIGNATED FEDERAL OFFICIAL:

KATHY WEAVER

C-O-N-T-E-N-T-S

P R O C E E D I N G S

(8:33 a.m.)

CHAIRMAN BROWN: The meeting will come to order. The meeting will now come to order. This is a meeting of the Digital Instrumentation and Control Subcommittee. I'm Charles Brown, Chairman of the committee. ASCR members in attendance are Jose March-Leuba, Dennis Bley, Joy Rempe, Pete Riccardella, Matt Sunseri, Dick Skillman and Ron Ballinger. Is Vesna going to be on the phone or do we know?

MS. WEAVER: No, Vesna's not coming --

CHAIRMAN BROWN: Okay.

MEMBER RICCARDELLA: She's in New York.

CHAIRMAN BROWN: Oh, that's a good reason. Anyhow, representatives who are attending today are Stephen Geier, Steven Vaughn, let's see, Neil Archambo. Did I get that right?

MR. ARCHAMBO: Yes.

CHAIRMAN BROWN: Thank you. And then, Peter LeBlond. Right there. Okay. The designated federal official for this meeting is Kathy Weaver.

The purpose of this meeting is for the staff to brief us on their review of NEI 97-06, Appendix D, supplemental guidance for application of 10 C.F.R. 50.59, digital modifications. And Draft

Regulatory Guide 1.187, Revision 2, which will subsequently document the results of their review. The ACRS was established by statute and is governed by the Federal Advisory Committee Act.

That means that the committee can only speak through its published letter reports. We hold meetings to gather information to support our deliberations. Interested parties who wish to provide comments can contact our offices requesting time after the meeting's Federal Register notice is published. We also set aside 15 minutes for spur of the moment comments from members of the public attending or listening to our meetings. Written comments are also welcome. The ACRS section of the NRC public website, excuse me, provides our charter, bylaws, letter reports and full transcripts of all full and subcommittee meetings, including all slides presented at the meetings.

Today we will hear presentations from the NRC staff and representatives from NEI. The subcommittee will gather information, analyze relevant issues and facts. And formulate for post positions and actions as appropriate for deliberation by the full committee.

The rules for participation in today's

meeting have been announced as part of the notice of this meeting previously published in the Federal Register. As an add-on to the two -- to the particular previous two couple of sentences, all public people that are in the audience as well as the staff should be aware that comments by the subcommittee members themselves, individually, are their opinions, not those of the full committee. And are provided for staff consideration and their further work.

Currently, we have received no written comments or request for time to make any oral comments from members of the public regarding today's meeting. As always, we have one bridge line established for interested members of the public to listen in. Also the bridge line will be open at the end of the meeting to see if anyone listening would like to make any comments.

A transcript of the meeting is being kept and will be made available as stated in the Federal Register notice. Therefore, we will request that participants in this meeting use microphones throughout the meeting room when addressing the subcommittee. The participants should first identify themselves and speak with sufficient clarity and

volume so that they may be readily heard. Also, please silence all cell phones, pagers, iPhones, iPads, et cetera. Any other electronic miscellaneous inconveniences that you may own or have in your possession.

We will now proceed with the meeting and I guess I will call upon Chris Miller for introductory comments and opening remarks. Okay, Chris, fire on. Push the little button underneath at the bottom, the green light should come on.

MR. MILLER: Thank you, chairman, members. It's good to be back down here briefing you and we look forward to the discussion today on 10 C.F.R. 50.59 and NEI 96-07, Appendix D, as you mentioned in your opening remarks.

Our presentation represent NRC and industry progress over a two year period. To provide clarity, as industry performs, 10 C.F.R. 50.59 screening and evaluations for potential digital I&C plant modifications. This work supports actions described in the integrated action plan to modernize digital instrumentation and controls, regulatory infrastructure.

From April 2016 through 2017, the staff and industry participated in monthly public meetings

to resolve NRC comments on draft, NEI 96.07, Appendix D. In December 2017, NEI and staff mutually agreed to place the review on any NEI 96.07, Appendix D, on hold to dedicate resources to the issuance of RIS 2002-22, Supplement 1. That's a clarification on endorsement of Nuclear Energy Institute guidance on designing digital upgrades and instrumentation and controlled system. RIS 2002-22, Supplement 1, was issued on May 31st of 2018.

Then in July of 2018, NEI provided an update to any NEI 96-07, Appendix D. In August the NRC provided a set of comprehensive comments to NEI and began a discipline process for cataloging and tracking the comment resolution.

Five public meetings were held with industry to resolve these comments. Over 90 percent of the comments were resolved using this process. NEI submitted its final revision of NEI 96-07, Appendix D, to the NRC on November 30th of last year and requested endorsement on January 8th of this year.

So we have two divisions of NRR presenting before you today. My division, I'm the director of the Division of Inspection and Regional Support. And we also have the Division of Engineering that will be making comments.

Staff members at the table here today, Mike Waters, NRR, Division of Engineering, Phil McKenna, NRR, DIRS, Division of Inspection and Regional Support, Wendell Morton, NRR, Division of Engineering. We also have in the audience a number of staff members, Tara Inverso in DIRS, Dave Beaulieu, in DIRS, Norbert Carte and -- Division of Engineering, Dave Rahn, Division of Engineering, Erick Martinez, Division of Engineering. I see Nancy Salgado, Division of Engineering and Brian Smith, back -- in the back there, so we look forward to addressing -- presenting and addressing your questions. So thank you very much.

MEMBER BLEY: Chris. Can I take a minute before you guys --

CHAIRMAN BROWN: Please.

MEMBER BLEY: -- get started because I've gotten a little confused. And this is for all the staff. Don't answer this now, but as the talks go on today, if you can dig into this stuff it would help me. I'm going to read off a few things that caught my eye.

In the revised Reg. Guide, it says Appendix D does not replace or supersede NEI 01-01, in whole or in part. And licensees have the option to

use either that or Appendix D. Of course, when I read the description in NEI 96-07, Appendix D, they talk about the fact that you had trouble with submittals using NEI 01-01. So I'm a little confused about that.

The next thing is it says -- I lost it. Appendix D is applicable to digital modifications only and not generally applicable to 10 C.F.R. 50.59. Two pages later, it says Appendix D generally is acceptable as a means for complying with the requirements of 10 C.F.R. 50.59. And then there's a few more statements similar to that leaves me not quite sure what you're saying.

And then you have a section adding clarifications to Appendix D. This is in the Reg. Guide. As I read those clarifications, at least for a first time reader, they don't clarify anything. They get muddy as can be. It seems, in fairness, that all of these came about from reviews of examples or submittals and you're trying to preclude things you didn't like. I can't tell what those are when I read that, so if you can emphasis that and tell us more about the problems you ran into, it would be helpful because at least for me, I don't know quite what you want.

MR. MILLER: I think we'll be able to do

that. As we go through our presentation we'll address those issues, so I appreciate the question --

MEMBER BLEY: Perfect.

MR. MILLER: -- and we will do that. Thank you.

And so now I'll turn it over to Mike Waters.

MR. WATERS: Good morning. This is the agenda for today's meeting. We have a full packed discussion for you, starting with the 50.59, NEI 96-07 as -- and it funnels down to a revision to Reg. Guide 1.187, Revision 2, for endorsement of Appendix D. I won't focus on this too much so we can to the presentation.

Next slide please. Just for background for all the members. I know many of you have seen this already. This is the overarching plan we're working under to a modernized regulatory infrastructure with digital I&C. We list here some of the key directives from the commission. Addressing 50.59 guidance is one of the key activities which we're talking about today.

I'd just like to note, highlight what Chris said. You know, bullets two and three, engaging stakeholders in identifying common priorities and

solutions. And focus on a couple approaches to comply with requirements. This has been a focal point of this effort. We've had several meetings with industry to address this guidance and explore it in great depths different ways to address the DD-9 criteria for specific digital technologies.

Next slide please.

CHAIRMAN BROWN: Can I ask a question about that? On the technical, the technology neutral focus. I guess I've -- when you talk about that relative to the I&C and the regulatory guides and the, at least the major rule, 603.1991, I believe, when I read 19 -- 603, it's about as technology neutral as you can get. It doesn't tell anybody what piece part to use or whether it's got to be analog or digital or what have you. It's just kind of here -- overall basic concepts that you've got to comply with.

The Reg. Guides do provide some specificity but they are not necessarily from reading them, necessarily not technology neutral. So I -- everybody keeps, you know, talking about how we have this disconnect and I, for the last ten years, I've been trying to figure out where the disconnect is.

MR. WATERS: Yeah. So --

CHAIRMAN BROWN: So I haven't paid any

attention to that. I've just tried to use common sense.

MR. WATERS: No, that's absolutely correct. The IEEE standard has incorporated a role as technology neutral. It applies to analog and digital. The history of where of that came from is, as you recollect, we had a rulemaking activity for a latter version of IEEE, 603 and in that rulemaking proposal to the commission, we had recommended additional requirements conditions. Some focused on new reactor technologies versus operating reactors technologies to shorten it. And the commission did not agree with our proposed rulemaking and out of that guidance came this directive, make the rules technology neutral focused. And the guidance can be tailored if necessary.

So that was the directive of the staff to kind of keep the current framework on this, in my words, of being, keeping Sector 3 technology neutral. So, but this is a principle we try to apply to everything we do, not trying to, you know, bifurcate high level requirements specific for new reactors versus operating reactors and so forth.

CHAIRMAN BROWN: Yeah, I remember the rice bowl conflicts between the reactors and operating reactors. Okay. Thank you.

MR. WATERS: No problem. Finally, just to help you navigate, this is -- we have the Integrated Action Plan, Modernization Plans. I know there's a lot of numbers here. Highlighted in blue is activity A. We're talking about the data. We'll -- Phil will talk in detail.

Just to explain to the members, we were at last year and this year. Last year we did issue the RIS supplement for 50 to 59, 50.59, that was MP 1A, that was complete. In parallel, we also issued ISG-06, Revision 2, for licensing which we did brief the ACRS members on. This year we're doing endorsement review of Appendix D to further extend guidance for 50.59 and in parallel, as you know, we are starting work on our branch technical position, 7-19, for licensing, which we will brief the ACRS later this year, I believe, given current schedule. So these are all the -- I can work on them.

CHAIRMAN BROWN: I think that's -- we're going to work in the fall for that.

MR. WATERS: Yes.

CHAIRMAN BROWN: Okay. Sometime, whenever it's the right time.

MR. WATERS: So unless there's any questions on this, I'll turn over to Phil to begin

discussion of Appendix D.

MR. MCKENNA: Okay. Good morning. So I'm going to pick up on this slide which talks about the Modernization Plan, Number 2, which is assuring there is adequate guidance through Appendix 96-07 for 10 C.F.R. 50.59 evaluations of digital I&C upgrades. And the main goal, that was to reduce licensing uncertainly and clarify the regulatory process for digital I&C upgrades.

The following is accomplished so far which we actually mentioned a few times already. We issued the RIS Supplement 1 back in May. We had public meetings to comment on Appendix D. We developed the Reg. Guide, Revision 2, which you have. And we've also conducted regional inspector training for Regions 1 and 4 in December. And we'll hit up Regions 2 and 3 inspectors in June 2019. And that training was focused on the RIS Supplement 1.

So now we'll go into an overview of 10 C.F.R. 50.59 and I'll do this as quickly or as slowly as you would like. But this takes us back from the beginning.

So the rule was first promulgated in 1962 and modified in 1968. It allows licensees to make changes to their facility without prior NRC approval.

And the entering argument into that is they must maintain acceptable levels of safety as documented in the FSAR. The rule was revised in 1995 and issued in 1999, which increased the flexibility for licensees. It allowed them to make changes that only have a minimal increase in the probability of consequences of accidents.

And back in November of 2000, we first issued Reg. Guide 1.187 which is the current revision right now. We are soon to issue Rev. 1 which will updated guidance for SONGS, steam generator replacement, lessons learned.

NEI 96-07, which is the document that the industry had written, was originally endorsed by NSAC 125 -- or was originally issued as NSAC 125, but was not endorsed by NRC. Industry came in with Revision 1 to 96-07 which basically is a fairly detailed document that runs you through how to do a 50.59 process for a modification. The applicability stage, the screening process and the evaluation process. Again, that was endorsed by Reg. Guide 1.187. And in our endorsement statement we said that it provides a method acceptable to the NRC for complying with Rule 10 C.F.R. 50.59.

Again, I mentioned that Rev. 1 will be

issued for that Reg. Guide based on the San Onofre Generating Station, lessons learned. And it will clarify 50.59 guidance on departures from a method of evaluation and accidents of a different type.

So in the 10 C.F.R. 50.59, there is relationships to other licensing processes. I list those on the slide here. Amendments to the operating license are covered under 10 C.F.R. 50.59. More specific regulations apply over C.F.R. 50.59. For example, quality assurance program, security, emergency planning, program changes, all fall under the conditions of licenses and 10 C.F.R. 50.54(f).

Exemptions to the licensing are processed under 50.12. Maintenance rule, maintenance activities are assessed and managed under 10 C.F.R. 50.65. And if there's license conditions in a licensee's license, they are controlled under the license condition and not under 10 C.F.R. 50.59.

So just a little bit of an eye chart, but this is taken out of NEI 96.07 which would basically run somebody through the process of how to do a 50.59 from when you proposed the modification and through the evaluation stage. And I'll quickly highlight some things on here.

So first entering argument in this is

licensee decides that the modification is safe to do. And then if it involves a change to tech specs, automatically kicks out 50.59, does not cover any changes to technical specifications. And then it goes down to the next section where I talked about the other 10 C.F.R. processes that apply. That will kick you out of it also.

And next you get into the screening portion of it to where you screen a modification for adverse or non-adverse. If you determine that the modification is non-adverse you're then kicked out and can proceed on with the modification. If you determine that, or licensee determines that, the modification is adverse then they go into the evaluation phase of 10 C.F.R. 50.59. And at the end of that evaluation phase, they either determine that a license amendment is required or they can proceed on with the modification. And I will go in further detail in this process chart as we go on here.

Okay. So skipping ahead to the evaluation criteria. So licensee has finished the screening. They determined that the modification screened as adverse, meaning they need to go onto the next step of 50.59 to evaluate it against each criteria. I mentioned that if it's a change to technical

specifications, you're no longer in 50.59. You have to come in with a license amendment to the NRC. And then there's eight screening questions or eight criteria for evaluation criteria which you have to not meet any of these criteria to go on and proceed without a license amendment. And I will --

MEMBER BLEY: Are those in the rule or in the guidance?

MR. MCKENNA: They are in the rule.

MEMBER BLEY: Okay.

MR. MCKENNA: So these are rule criteria and I have the subparagraphs of the rule next to each of the eight criteria in the side brief. And I'll read each one.

So the first one is a result in more than a minimum increase of frequency occurrence of an accident previously evaluated in the FSAR. Criterion 2 is result in more than a minimum increase of the likelihood of occurrence of a malfunction of an SSC, important to safety previously evaluate an answer.

MEMBER SKILLMAN: Before you --

MR. MCKENNA: Yes.

MEMBER SKILLMAN: Phil, before you change that. In the meetings that you've experienced with industry and in the -- particularly the input you may

have received from your inspectors, what has been the feedback from understanding of frequency of occurrence versus the likelihood of occurrence?

I think back in all of the years I've been involved in 50.59 and the understanding of what the difference is between frequency and a likelihood can be a conundrum for the evaluators for the owner. And I'm just wondering, what feedback do you have from this latest campaign where licensees are trying to answer this question and your inspection team or your residents are watching this and challenging this?

MR. MCKENNA: So further along in the brief we will discuss problems that were in the industry on executing a digital modification using past guidance. I don't think they resolve so much around those questions. They really resolve around screening and proceeding on with the 50.59 section. But maybe if anybody -- Dave is raising his hands. I'll pass it over to Dave Beaulieu.

MR. BEAULIEU: Yeah. The two concepts are related. Criterion 2 deals with the likelihood of a malfunction which is a likelihood of failure. And that's -- you'll find that qualitative assessment. That's a common theme is that Criterion 1, 2, 5 and 6 all deal with the likelihood of failure. The criteria

use different wording but -- and have a different focus, but they all stem from the likelihood of failure. And so when it comes to likelihood of failure, likelihood to Criterion 1, frequency of occurrence of an accident, well, frequency is directly related to the likelihood of failure.

Accident deals with the likelihood of failure of a piece of equipment that can initiate an accident, so it's narrow in scope. But Criterion 2 you'll see likelihood of a malfunction of a SSC so that's a little, that's a little bit broader than the accident, so.

MEMBER RICCARDELLA: Is the key difference between those two not so much frequency versus likelihood, it's the rest of the sentence, right? It's whether it's --

MR. BEAULIEU: It's the --

MEMBER RICCARDELLA: -- an accident versus failure of an SSC.

MR. BEAULIEU: Right.

MEMBER RICCARDELLA: Right. The feedback that we --

MR. BEAULIEU: It has to do with a piece of equipment that can initiate an accident. That's what -- so if it doesn't impact equipment, piece of

equipment, they can initiate an action or transient, then you pass Criterion 1.

MEMBER RICCARDELLA: Dennis, help me. How do you differentiate between frequency and likelihood?

MEMBER BLEY: I don't think you do up here. Likelihood is a more general concept. Frequency is a particular measure. Probability is another measure. If you're doing a probability, it's within some particular time period or some other event. I think here the way they're using them they're essentially equivalent.

CHAIRMAN BROWN: I'll just make one observation on that. I understand your confusion because I had it. But likelihood to me normally meant there's not a calculated frequency for the failure or that occurrence. An engineering judgment based on largely qualitative --

MEMBER BLEY: As I said, likelihood's a more general concept.

CHAIRMAN BROWN: Exactly. And --

MEMBER BLEY: Frequency is one measure of likelihood. There are others.

CHAIRMAN BROWN: But yes, if you have a --

MEMBER BLEY: But it doesn't necessarily mean you're just being qualitative.

MEMBER RICCARDELLA: So --

MEMBER BLEY: And frequency is also a measure of likelihood.

MEMBER RICCARDELLA: So frequency's a measure of likelihood?

MEMBER BLEY: Yeah, can be.

MEMBER RICCARDELLA: Okay.

MEMBER BALLINGER: But the way I look at this is Criterion 1 relates to an accident that could occur and the steps to get to that accident are multiple. Whereas, the likelihood of occurrence of a malfunctioned Number 2, is a malfunction of a component which may result in that accident occurring. Is that not correct?

CHAIRMAN BROWN: Or, you --

MEMBER BLEY: But a system or a structure.

MEMBER BALLINGER: Yeah.

MEMBER BLEY: So a system has multiple components.

MEMBER BALLINGER: Right, but --

MEMBER BLEY: And it's more complex calculations.

MEMBER BALLINGER: -- they all relate to the upper level accident.

MEMBER BLEY: That's what they say, yeah.

MEMBER BALLINGER: Yeah.

MEMBER BLEY: I shouldn't be speaking on their behalf because I don't know exactly how they used they words. But the way I described it, I think, is generally acceptable.

CHAIRMAN BROWN: I interrupted Wendell, so he can --

MR. MORTON: That's okay. I just want -- to directly answer your question, during the process of reviewing Appendix D, and the comments we got and feedback we received, we didn't receive specific feedback or any confusions between the use of the phrase increase in frequency versus increase in likelihood.

MEMBER SKILLMAN: Thank you. You've answered my question.

PARTICIPANT: That answered the question.

MEMBER SKILLMAN: And I appreciate your saying, stand-by because we're going to get into some of the examples later.

MR. MORTON: Yes.

MEMBER SKILLMAN: I got that.

MR. MORTON: Yes.

MEMBER SKILLMAN: But I will comment, having spent a lot of time at sites and having been an

overview positions of multiple sites to determine whether or not the 50.59s were, in fact, done correctly, that is -- it's a screening for a license amendment, not an mini-mod process. If you recall, many sites were using 50.59 as kind of a mini-mod process. The individuals that were doing the screening would become confused here because of the potential similarity of interpretation of frequency of occurrence versus likelihood of occurrence. Just like we had around the table here. So I appreciate you saying that wasn't on the radar screen for the comments but I will be curious how you speak of this as you go ahead.

MR. MORTON: Right. That wasn't a point of confusion or concern, at least that part of the phrase -- of the rule of language. It's the latter part of the sentence which was more the focus of concerns and then the actual result with Appendix D and R.

MEMBER SKILLMAN: Thank you. Again, thanks.

MR. MCKENNA: I'm back on here. Okay. So again, we're -- this is Criterion 3, results in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR. Criterion

4, result in more than a minimal increase in the consequences of a malfunction of an SSC, important to safety. Strike accident there, it shouldn't be there. To safety previously evaluated in the FSAR. It was a typo. Create the possibility of an accident of a different type then any previously evaluated in the FSAR.

Create the possibility of a malfunction of an SSC with a different result than any previously evaluated in FSAR, that's Criterion 6. Criterion 7, result in a design basis limit for efficient product barrier as described in the FSAR being exceeded or altered.

And finally, Criterion 8, result in a departure from a method of evaluation described in the FSAR used in evaluating the design basis for a safety analysis.

MEMBER BLEY: Could you clarify a little bit, Criterion 6? I know how I'm interpreting it, but I don't know if that's how you intend it.

MR. MCKENNA: So interesting enough, Criterion 6 is what we had the most issue with --

MEMBER BLEY: I can understand that.

MR. MCKENNA: -- in Appendix D. So I'll pass it on to Wendell.

MR. MORTON: Sure. Well might I ask, what's your interpretation of Criterion 6?

MEMBER BLEY: Well, that makes it too easy

MR. MORTON: Before I -- because I can --

MEMBER BLEY: -- for you to say oh, yeah. Well, to me, what this means is if I'm substituting, say component A for a new component B, if component B has failure modes that create different effects then the failure modes in component A, I would think that would come under Criterion 6.

MR. MORTON: Yes, correct. Now --

CHAIRMAN BROWN: You want to say that again?

MEMBER BLEY: Yeah. You got a widget and then you got a new better widget.

CHAIRMAN BROWN: Yeah.

MEMBER BLEY: You think it's better, but the original widget could fail to deliver a voltage signal somewhere. The new widget could do that, but it could also have some other failure mode --

CHAIRMAN BROWN: But don't you have --

MEMBER BLEY: -- that you haven't considered.

CHAIRMAN BROWN: That's what I wanted to

get at --

MEMBER BLEY: That the first one didn't have.

CHAIRMAN BROWN: Okay. That's what I thought you said.

MEMBER BLEY: So it might not be worse, it might be better but it introduces something new and that's saying if it does, then you can't live with this anymore.

MR. MORTON: Well, no --

MEMBER BLEY: You have to justify it through the --

MEMBER SKILLMAN: But the operative word there is different, right?

MR. MORTON: Than previously analyzed.

MEMBER BLEY: Yeah.

MEMBER SKILLMAN: Then previously analyzed.

MR. MORTON: Correct.

MEMBER SKILLMAN: So you need to know what it was before so that you have a comparison basis.

MEMBER BLEY: Oh, absolutely.

MEMBER SKILLMAN: Bingo.

MR. MORTON: Correct.

MEMBER SKILLMAN: Thank you.

MEMBER REMPE: So -- well, I have a different question. Go ahead and finish this topic. Are you done with it? Okay. When I look at the third and fourth ones, if I think about a bunch of different regional offices, it sure seems like that would introduce a lot of regulatory uncertainty, especially the probability of an accident of a different type than any other previously evaluated in the FSAR. It seems like people would be looking all over for new and different things. And how does -- it seems like there should be some sort of headquarters oversight of something like that or something so you don't have people going off the deep end looking for new things that are different.

MR. MCKENNA: So in my previous job I was an inspector in the field for the past eight years. And this reported to headquarters back in October. So if there's questions on the criteria that the licensee is screening, those questions typically come in to our branch to resolve. So they speak to our branch in DIRS since we're the interface with the inspectors in that region.

Now to answer your question about Criterion 3 and 4, I would say they're probably no different than the other criteria if you had a

question in the field on how the licensee is evaluating that modification in accordance with those criteria.

MEMBER REMPE: So again, there's design basis accidents that are evaluated in the FSAR and suddenly you've opened it up to other events that aren't considered in -- that may -- again, this is with 10 C.F.R. 50.59, it's not specific to the topic today, but when I looked at this I was just thinking man does -- how do you rein in and keep people on the same path of what can and can't be considered?

MR. MORTON: So one of the things to keep in mind as part of this discussion is the RIS Supplement 1 to 2002-22. One of the clarifications we made is that when it comes to the qualitative assessment, we actually put guidance within that RIS Supplement that kind of points you in the directions of what types of digital modifications could trigger Criterion 5 in terms of creating an accident with a -- of a different type. In terms --

MEMBER REMPE: So it's not a wide open field?

MR. MORTON: It's not a wide open field.

MEMBER REMPE: That's good to know. Thank you.

MR. MORTON: There is specificity. We're telling the licensees how you should look at your proposal mod to see if there are different types of configuration. You have a digital introduction to software, shared resources, because of the new technology. How you could trigger Criterion 5 and 6, for example. And we try to leverage that within Appendix D through our clarifications in the Reg. Guide. So we'll get more in details in that later.

MEMBER BLEY: Let me take you back to my opening remarks.

MR. MORTON: Yes.

MEMBER BLEY: In the Reg. Guide you had a discussion that, an example 4.19 of Appendix D, they said the acceptability of new area radiation monitor will be dictated by their reliability which is assessed as part of Criterion 2, not Criterion 6. And then you objected to that and said well, you need to see if there are other failure modes applicable. I would have thought they would have addressed that but apparently they didn't in the example.

MR. MORTON: I guess we're going to jump ahead a little bit in terms of that discussion. So that's some of the places where staff and NEI part ways in terms of the Criterion 6 guide. So that

example is when the Criterion 6 guide inception for Appendix D.

MEMBER BLEY: Okay.

MR. MORTON: With that particular example, it was the staffs' position that it gives the impression that potential software CCA is not --

MEMBER BLEY: In just talking about -- looking at this as an example.

MR. MORTON: Right.

MEMBER BLEY: Okay. I got it.

MR. MORTON: Okay.

MEMBER BLEY: Thank you.

MR. MORTON: Yeah.

MEMBER BLEY: And you don't -- you wanted the example to be more general?

MR. MORTON: Well, the point exists --

MEMBER BLEY: Or at least to narrow its --

MR. MORTON: Not introducing guidance within an example when it's not within the descriptive material of Appendix D.

MEMBER BLEY: Okay.

MR. MORTON: Okay.

MR. MCKENNA: And also, when I was answering your question, I was answering general 50.59. Wendell asked it if we're digital, so just to

clear that. Although, this briefing is more digital.

MEMBER REMPE: And so is --

MR. MCKENNA: Yeah.

MEMBER REMPE: There is guidance somewhere also for just generally what can and can't be included or they have to interface with headquarters in your branch here?

MR. MCKENNA: Well, the guidance for 50.59 is what I briefed first. So we have the rule 50.59. There's NEI 96-07, Rev. 1, which is the industry guidance which we endorsed through the Reg. Guide 1.187. So that's all the guidance. And then if there's any specific questions on a 50.59 issue, then they would come to headquarters to ask these questions --

MEMBER REMPE: Yeah, I did look through the --

MR. MCKENNA: Yeah.

MEMBER REMPE: -- 96-07 and I didn't see anything that said you can't go off the deep end and start making up new design basis events for evaluation when you're trying to substitute or look at an accident of a different type than previously evaluated in the FSAR. That seems like it's very wide open.

MR. BEAULIEU: Yeah, the -- this is Dave

Beaulieu. In fact, we're issuing a -- it's about to hit the street, Revision 1 to NEI -- or Reg. Guide 1.187 that clarifies that exact question. What is an accident of a different type? And --

MEMBER REMPE: It limits it?

MR. BEAULIEU: Yes. And --

MEMBER REMPE: Okay.

MR. BEAULIEU: -- it really has to do with it's actually not an easy question to answer, but it's a question -- it's a -- the commission intended if it was an accident, if it was -- the plant was being designed today it would be an accident in the FSAR. It's of a similar frequency and significance of those in the FSAR, but they're -- but none of the methods of that are evaluated the current methods are applied to this new scenario, but it -- so we attempt to -- we clarify that in Revision 1.

MEMBER REMPE: Okay. I'll look through that again.

MR. BEAULIEU: That's a good question. That's a -- the guidance isn't really particularly clear regarding that.

MEMBER RICCARDELLA: Could -- just for my clarification, just for my clarification, the six or eight things that we're talking about here are general

50.59 stuff, not specifically related to this

MR. MCKENNA: That is correct. We have not gotten to any digital briefing yet.

MEMBER RICCARDELLA: Right.

MR. MCKENNA: This is all general.

CHAIRMAN BROWN: Just for calibration, when we get to Appendix D, Section 4.3 deals with one through eight, 4.3.1, the way they structured it so that they map up to Criterion 1 --

MEMBER RICCARDELLA: Yeah, I understand that.

CHAIRMAN BROWN: -- 2, 3, 4, 5, 6, 7, 8. That's the only point I was trying to make for calibration part purposes. That made it easy, somewhat easy.

MR. MCKENNA: So we're beginning to approach the digital guidance. We're not there yet though. So now I'm going to talk fairly quickly on NEI 96-07 which, again, was the industry guidance that we endorsed through the Reg. Guide. Okay. So NEI 96-07, Revision 1 provides the guidance for implementing the 10 C.F.R. 50.59 rule and that is as of 1999.

MEMBER BLEY: Can I ask a question? The basic NEI 96-07, Rev. 1 is the guidance. The

Appendices, including Appendix D, we're talking about just kind of refines how you meet what's in the main document. Is that -- is that the correct interpretation?

MR. MCKENNA: That's correct. So the Appendices that are in 96-07, only supplement the 96-07 guidance.

MEMBER BLEY: Okay.

MR. MCKENNA: And the only -- I'll stop there.

MR. WATERS: Yeah. Maybe I'll would provide just a little bit of broader context. 50.59 applies to all modifications to plan, of course. 96-07 based document applies to all modifications, including digital. The challenge that was faced is when you put a digital mod in you may interconnect systems, you may have software cross redundant systems. You raise challenging regulatory and technical questions. And the whole purpose of Appendix D was to clarify those issues within a base framework within the NEI 96-07. Is the challenge of the digital technology when we're, you know, integrating systems together, for example, we're interconnecting them.

MR. MCKENNA: Okay. So NEI 96-07, Rev. 1

is set up, again, going through the applicability of the modification, the screening, the evaluation process, gives some guidance for applying 50.59 to compensatory actions to address non-conforming or degraded conditions. And it talks about how to retain 10 C.F.R. 50.59 evaluations in accordance with the rule.

So now we're going to start going into the digital part. So digital guidance was first addressed through the industry in EPRI TR-102348 which was issued in 1993 to establish guidelines for digital upgrades. We endorsed that through a Generic Letter 95.02 and that was superseded when Rev. 1 was issued to the EPRI guidance. And that was issued as NEI 01-01. So NEI 01-01 is still in effect today. We endorsed that through RIS 2002-22 which is still in effect today and you'll recognize that number. That's what we issued the Supplement 1 to, to clarify guidance for digital modifications.

So NEI 01-01 is what I'll focus on in the next couple slides. Again, it was issued in March 2002 to help nuclear pen operators implement licensee digital upgrades in a consistent, comprehensive and predictable manner. It has -- it's a fairly extensive guidance and it gives guidance on the technical side

of the modifications and guidance for how to perform a 50.59 evaluation for a digital modification. And it also gives guidance for a licensee amendment request if you're in that -- if the licensee is in that step of doing the modification.

So throughout the years we found that industry was inconsistently applying the guidance in NEI 01-01 in digital upgrades. Mainly because of what I've listed here. The lack of industry guidance for a technical evaluation of common cause failures. We had a couple issues that were noticed in the inspection program which I've highlighted on the slide. The first one was the implementation of a digital controls, a LaSalle Rod Control Management System modification which we published in an info note, 2010-10 to describe that issue. And also in Harris 2013 violation in Region 2 where they did a modification to their solid state protection system and replaced some circuit boards that had complex programmable logic devices in those circuit boards. And didn't go through the evaluation phase of 10 C.F.R. 50.59.

MEMBER BLEY: This is kind of an overview for us, I suppose. Were there many more violations and other issues? Because something drove us to come

out with this Appendix D.

MR. MCKENNA: Right. So no other issues than what I'm highlighting here, but I think what happened back when we started to uncover the stuff is -- and why we had to go into this process is licensees reevaluated say, how are we going to do digital modifications using the 50.59 process since we are, potentially, not doing it correctly. So it slowed down digital modifications.

MEMBER RICCARDELLA: So when you say there was a violation, did the violation mean that they did something wrong in the modification or they just did --

MR. MCKENNA: The violation --

MEMBER RICCARDELLA: -- without -- did it without coming for a license amendment?

MR. MCKENNA: The violation in this case was a violation of 10 C.F.R. 50.59. So they did not file -- they did not do the rule the correctly and that's what the violation was implementing TLC. In that case they should have either completed the evaluation or should have come into the NRC with a license amendment. In this case they didn't.

CHAIRMAN BROWN: So their assessment should have said hey, we've got something different,

we got the software, TLCs, and therefore, we need to do an evaluation. And that would have kicked them into Item 6, I guess, for what you're talking about in this PLC issue. And that they should have said uh-oh, we failed. In other words, we don't meet that, therefore, we, I think this is a negative reversing. So they should have come in with an LAR? Is -- that was the conclusion you reached and that's why it was a violation?

MR. MCKENNA: So I'll hand it over to --

PARTICIPANT: Norbert.

MR. MCKENNA: Norbert.

MR. CARTE: I'm Norbert Carte. So two different types of violations. The first violation was what we would call a D1 violation under Clause D1, which was inadequate documentation. So they did not provide sufficient documentation for the conclusion that they reached.

The other violation was C26 violation, so they had not eliminated from consideration common cause failure. So again, based on the information at hand, they inappropriately reached that conclusion.

The C26 violation says you should have come in for a license amendment. The D1 violation says basically, you should have done your paperwork

better. And to resolve the D1 you -- they did additional analysis and demonstrated that there wasn't a problem.

MEMBER SKILLMAN: So if I could ask, in these two cases were in either case the licensee gaming the system? In other words, were these errors of commission or omission?

MR. CARTE: I think there was a confusion, confusing technical and --

MEMBER SKILLMAN: Administrative?

MR. CARTE: -- licensing guidance. The technical, what is a digital -- when do you need to consider CCF and what is licensing guidance? I don't think it was an intent to game the system.

MR. MORTON: Right. I believe in -- and correct me if I'm wrong staff, but I believe in the Harris example they actually screened that mod out. They didn't actually get to the evaluation, correct?

MR. CARTE: Correct.

MR. MCKENNA: That's correct.

MR. MORTON: So there was -- I believe in that case there was a failure to recognize how software can effect this particular mod in the 50.59 criteria in itself, necessitating, maybe, some better clarifying guidance because digital is complicated

when it comes to 50.59. The staff recognize it, industry does as well, which proceeded to what we're talking about today.

MEMBER SKILLMAN: Okay. Thank you.

MEMBER RICCARDELLA: So the resolution was that then ultimately they did come in for license amendment? The resolution of these?

MR. CARTE: So there were two different resolutions. On the first one, the basic problem was they installed a rod control system that had the potential to withdraw multiple rods when the originals did not. And that could have occurred due to a number of errors, so -- but they never did an analysis to say that the plant would be okay if that happened. So they then subsequently did the analysis and said they were bounded. And therefore, they would pass the criteria. So that was a failure to do adequate analysis and documentation. They believe that they didn't need to do that analysis because the failure was not incredible.

The second one was a little bit more complicated. Multiple plans had installed these cards. What we decided to do was issue an EGM, Enforcement Guidance Memorandum, to withhold issuing a bunch of violations until we resolved the issue. We

requested that the PWR Owners Group submit a topical report and we wanted to address this generically. And based on that topical report, we concluded that they had done sufficient analysis of the testing to demonstrate that common cause failure was not a consideration under 50.59. And then the remaining installations and modifications never came in for a license amendment request.

MEMBER RICCARDELLA: Okay. So in both cases, had they done the proper 50.59 evaluation it would have come out that they didn't need a license amendment, is that right?

MR. CARTE: Yes.

MEMBER RICCARDELLA: Thank you.

MR. MCKENNA: So again, I think why Norbert hesitated on that is --

MEMBER RICCARDELLA: It's complicated.

MR. MCKENNA: -- they actually have to do the evaluation before we can, you know, we can't pre-judge the decision.

MEMBER BLEY: I'm jumping the gun a little bit again. You're going to get to Appendix E in just a minute. What is the logic and the need for retaining the ability for a licensee to use NEI 01-01 given you have new guidance?

MR. MORTON: Okay. To get to your point. Earlier you had some questions, so we'll have to -- we're going to have to get into a little bit of a history of what we're talking about. And I would request that look at that last bullet on this slide which is the staff issued a letter publicly into NEI stating a number of different concerns we had with the guidance because NEI 01-01 at this point, in 2013, was fairly old at this point. There were a number of technical concerns, but not with the -- with NEI 01-01 but not with the licensing piece. So if you -- right, so if you have not read NEI 01-01, it has 50.59 licensing guidance and technical guidance interspersed throughout the document. They are not separate entities. It's all within one package.

The staff had a lot of concerns with a 01-01, the technical piece but not necessarily the licensing piece which the 50.59 guidance. 01-01 had screening guidance and has evaluation guidance. It even has some guidance on addressing software common cost failure as well.

Part of that concern is that, you know, if licensees are having trouble. In the case of the SSPS card issue not recognizing that maybe this should screen in, either the base part of the process should

it screen in or not? If you're not seeing that that's an issue with software then we've got larger issues going on that maybe across the board. And that really resulted in the letter signing off from staff saying hey, there's some things we, they need to take a look at.

So it's part of that and NEI can to speak to that more when they actually speak. But as part of the overall game plan they decided to come in with sort of a two phased approach. One was splitting off NEI 01-01 into two different documents. One was the licensing document which is Appendix D. A second was a technical document to replace the technical content of 01-01. Together those documents would be sufficient to supersede NEI 01-01 so that licensees could put NEI 01-01 to bed and use these two adjoining documents. That was the game plan presented to staff back in 2016, I believe October.

So when we're reviewing this, we're reviewing from the standpoint of hey, you've got a technical document that's, it's backing up the licensing consideration they're doing with Appendix D. The technical document hasn't quite -- isn't quite fully baked yet in terms of being provided to staff for a full review endorsement as well. We don't

really have that in our hands --

MEMBER BLEY: You have had not had -- okay.

MR. MORTON: We've been given draft of a document. NEI can speak to that more, but there were concerns with that particular document and at this point that review's been delayed in terms of that document --

MEMBER BLEY: What kind of document would this be? Would it be like the topically or something?

MR. MORTON: It could be a topic. It was not submitted to us as a topical.

MEMBER BLEY: Okay. Hasn't been submitted to you yet --

MR. MORTON: No, not --

MEMBER BLEY: -- in any form? Okay.

MR. MORTON: Just here, take a look at this, see what you can review, see what you think about it, to that part. So that --

MEMBER BLEY: So using Appendix D before that technical report's in place sounds problematic. I don't know if it is.

MR. MORTON: Ergo some of the clarification exceptions we ended up taking because without the technical document to sort of enforce some

of the things that's in Appendix D we're reviewing it sort of in a vacuum.

So on the one hand that results in some of the clarifications and exceptions you'll see. But on the other hand, one of the particular one that you cited was that we could not -- we couldn't find Appendix D adequate to supersede NEI 01-01 by itself without a technical adjoining document to go along with it. That's why we'll still have 01-01 and the RIS Supplement 1 on the streets with Appendix D because we don't have a technical basis to administer, to allow us to supersede that at this time.

And it's one of the reasons why the risk supplement came into being is because we wanted to get short term guidance for low safety significance systems to get those mods modernized to plants. In the meantime, we're still looking for the technical base document that can -- when they help supersede some of the older guidance.

MEMBER BLEY: Okay.

MR. MORTON: But until then, the game plan is what you're seeing inside the Reg. Guide right now.

MEMBER BLEY: A little related issue for me is given this separation into two documents, I'm assuming there's also -- I haven't sat down and

compared them. The hope is that the two new documents will clarify some of the things that weren't clear to licensees in the 01-01?

MR. MORTON: Yes.

MEMBER BLEY: Okay. But we aren't there yet, so we're just kind of getting advance look. You -- now you can use Appendix D, but you have to use the guidance and the RIS as well.

MR. WATERS: I -- this is Mike. I think we're part way there. I think the other part is we issue the Supplement, which is two files in one, which does provide the licensing interpretation with some general guidance of how do you determine common cause failure, sufficiently low. I mean, the think the example Wendell's -- to me the primary thing was to answer the criteria in 50.59 is you make a determination, for example, a common cause failure, sufficiently low, that makes sense.

You can define what that means from the 50.59 criteria standpoint. But then from a technical standpoint, okay, what does that really mean to say CCF is sufficiently low? What message do you look at? What features you consider? How'd he get that technical conclusion? And that's the struggle we had. NEI 01-01 had a lot of technical guidance.

Appendix D does not have a technical guidance and that's how we got to this point in day where he issued a RIS Supplement to provide the licensee interpretation with some technical factors to look at for the quality of assessment. And we're trying to incorporate this thought processes into the Appendix D endorsement review.

MR. MILLER: So if I could. This is Chris Miller. The question was asked, so what drove us there? And what exactly drove us there is because we had, you know, licensees were saying well, wait a minute, I'm not sure I'm a, you know, want to issue any digital -- do any mods on the 50.59 because I'm going to get challenged on it by NRC.

And so we had to bridge that gap. The RIS, we think, bridged the gap and the guidance. And so now you'll hear in this presentation later that there's a number of mods being planned or in progress that are using the guidance and the RIS. And so in this -- so this effort is just to move on from that guidance and the RIS and provide additional clarification. But we do think that big picture wise we solved a lot of the problems that we had with not being able to issue digital mods under 50.59.

MEMBER BLEY: Two related things. Are

licensees, any licensees, still making submissions using 01-01? Do you have any of those coming in?

MR. CARTE: Norbert Carte. And so the license gives them, under 50.59, the discretion to make decision whether a change requires a license amendment. So when they use 01-01 they -- you use it essentially to pass 50.59 and not a license amendment. You don't really reference 01-01 as part of a license amendment.

MEMBER BLEY: Yeah, I get that.

MR. MORTON: I think, along with what Norbert was saying, if the licensees are using RIS 2002-22, Supplement 1, which is a quality assessment guidance, it's based upon the technical content of NEI 01-01. So if they're using the supplement they are, in effect, still using 01-01. If that's -- I think that's what you're asking.

MEMBER BLEY: Sort of, yeah. The related question, and you may have sort of answered it already, at some point -- well, at some point in the future, maybe we'll only have one of these two things available then. In the interim, when we have both possibilities, you need -- and I assume the first batch that you're going to be looking at are using Appendix D and the RIS Supplement. At some point if

it stays this way, do you need some kind of extra guidance for the staff on how to look at one that comes in or gets inspected where they've used 01-01? Are we losing something? From the inspector's point of view, is it going to be obvious how to deal with these, using the two different sets of guidance?

MR. MCKENNA: So I -- from our feedback, to date, it looks like the licensees have shifted over to use the RIS 2002-22, Supplement 1, and are not using NEI 01-01 guides because --

MEMBER BLEY: That's kind of what I expected, but then --

MR. MCKENNA: -- Supplement 1 --

MEMBER BLEY: -- two years from now if we're still in the same boat, if somebody comes in the other way do you need anything for the inspectors?

MR. MCKENNA: Well, there wouldn't be any -- so the reason why we issued the RIS Supplement again is the NEI 01-01 introduces the term qualitative assessment.

MEMBER BLEY: Yeah.

MR. MCKENNA: Didn’t really tell you how to do -- places you've got to do it. The RIS --

MEMBER BLEY: Does.

MR. MCKENNA: -- gives you -- tells you

how to do it.

MEMBER BLEY: Go ahead. I'm sorry. I've beaten this enough.

MR. MILLER: I'm going to beat it just a little bit more just to say that you saw in Phil's presentation earlier that we have provided training to a couple of the regions. We're going to do some more this spring and to the other two regions. And we've also determined that when some of these mods are being inspected under a 50.59 inspection, we in the program office would write support to this initial ones that are going out there. So that's going to help calibrate us in did we get the guidance right or is there something else that we need to change? So we hope those will bear fruit in that area.

MR. MCKENNA: So I shifted to the slide as we were talking because we were talking to NEI 01-01 and I think we hit a lot of the highlights of this slide. I'll just leave it up there without going over each individual bullet in case the members have any questions. But these were all the concerns with NEI 01-01 and why we decided to issue the RIS and why industry decided to write Appendix D.

Again, if you go down to like the seventh bullet right there, it talks about NEI 01-01 contains

the two type of guidance embedded in the procedure for the technical side and how to do a 50.59.

So the big point on what makes digital modifications different from other modifications is the common cause failure issue. You can have combined function, shared communication, shared resources, software or -- in the safety model of a nuclear power plant when we had -- while we have hardware out there, it's -- the likelihood of common cause failure is said to be low because we maintain high standards. There's physical separation between equipment. And the degradation methods for a piece of hardware are slow to develop and we test for it. We do surveillances.

In this case you can have a -- for software you can introduce that error into the software, have the software in both trains of the safety system and, you know, not know about it until it rears its head and it causes an issue. So --

CHAIRMAN BROWN: So the definition of a common cause failure, based on what you just said, would be you introduce an error into the software? In other words, a design error. You don't consider something -- I'm still trying to figure out what you all -- how you all define a software common cause failure.

MR. MCKENNA: Well that's --

CHAIRMAN BROWN: Software's written, it's programed. It's stored in memory. It doesn't just disappear and the only -- in my -- this is my particular -- this is -- now I'm not speaking for the committee. This is just my own troglodyte, Neanderthal thought process. Those, that stuff's built in in the design. That's the way you program it. And if you have a common cause failure it means you have the same software process in each train. And, therefore, it responds incorrectly in each train. So that's a design error. It's not necessarily --

MEMBER BLEY: Or it could -- yeah, it is a design error, but it could be that the plant has brought itself into conditions that you hadn't quite --

CHAIRMAN BROWN: That's a design error.

MEMBER BLEY: -- analyzed.

CHAIRMAN BROWN: You don't consider the --

MEMBER BLEY: And how it takes out more than you expected.

CHAIRMAN BROWN: Well, if you don't consider the plant conditions with the software.

MEMBER BLEY: Software doesn't wear out. It doesn't have the characteristics of mechanical

failure so it's got to be --

CHAIRMAN BROWN: Exactly. Well --

MEMBER BLEY: Because it's executed in a different way then you expected.

CHAIRMAN BROWN: You can lose bytes and bits. You can lose memory.

MEMBER BLEY: That's true.

CHAIRMAN BROWN: Okay. At cosmic rays theory, right, you can -- well, actually, we know that happens.

MEMBER BLEY: It can be, yeah.

CHAIRMAN BROWN: But it's not like, you know, like, ten to the mat is 40 seconds or something like that. If you're inside of a ship particularly it's a little -- my point being is --

MEMBER BLEY: That's not quite applicable here, Charlie.

CHAIRMAN BROWN: -- we're really talking about you can have the same type of failure, common cause failure, relative to analog designs. If you design the analog system to not consider the circumstances under which it's got to operate correctly, then you have a problem. And that causes the common cause from a train to train situation there.

So, I mean, the way I view you have resolved this in the past is -- and others, at least on the stuff we've looked at over the last few years, is with the diversity issue, defense-in-depth diversity issue. In other words, you have something outside or off that has a different format then the main pathways to deal with the common cause failure issue.

Now you can debate whether you need to do that or not. You can assess it whether you need to do that or not and that, to me, is part of the assessment and the evaluation you go through because the last thing you -- in my own personal opinion, if you've got -- like some examples you all gave, somebody replaces a two train or two controller, redundant controller type system with two PLCs. They have the same software, they have the same inputs and outputs and off they go. Well, they could both fail, they could both do this.

But you don't necessarily want to have them built and designed with different components because that becomes an economic nightmare that won't help. So there's a trade-off. You have to have some assessment or evaluation that gets -- has a low likelihood. Here's where we get into the stork dance

of likelihood. So I just -- this is a very difficult process to go through.

MR. WATERS: I mean, from a highest level we had these questions when we went down this path of when we had Appendix D and then what we did through RIS. And I think what you said about having diversity and having that low assurance for protection systems, absolutely correct. And I think we're maintaining that philosophy and this will be a subject of -- BT 719 would be for later for, like, just amendment. For the RIS Supplement we were focused on this over auxiliary support systems. The chiller was a common example. Whether you have, you know, just a possibility of a multiple -- two chillers failing at the same time from software, can you determine if CCF is sufficiently low and address the client from that standpoint. So this is really targeted at those type of over stipulated systems and off systems outside the core protection systems.

MEMBER RICCARDELLA: For non-electrical engineer, non-I&C person like me, what's the essence of the difference in common cause failure considerations between an analog controls and digital controls?

MR. MORTON: So one of the things that, I

think, Appendix D does a good job of now is it actually tells you --

MEMBER RICCARDELLA: Appendix D?

MR. MORTON: Appendix D.

MEMBER BLEY: The new appendix.

MR. MORTON: NEI 01-01 as well, that's the previous document, is it why is digital different than all these other disciplines? What makes it hard? So the introduction of software. And as Charlie was talking about, it's very difficult to demonstrate that a complex software package is free of design errors or bugs because we distribute it. And if it's distributed within different redundant, different redundant channels.

MEMBER RICCARDELLA: I'm familiar enough with software to understand that.

MR. MORTON: That's just one aspect of it. Another ability of digital versus the analog was combining of different design functions on the same process or chip. So as you had previous segregated systems, even within the protection system or non-protected systems like, say, safety chillers, for example, in order to consolidate parts, reduce your costs. You can consolidate functions, different design functions, onto the same processor or series of

processors. It gives you redundancy and reliability and reduces costs.

MEMBER RICCARDELLA: Yeah.

MR. MORTON: But it also is doing something that 50.59 will have a hard time with.

MEMBER RICCARDELLA: We're using the term software but it's really firmware, right?

MR. MORTON: For the -- for the purposes of this discussion we're just trying to keep it succinct in terms of just software considerations. But other half is you're introducing shared resources in a way that you weren't previously doing which is introduction to digital networking, introduction interconnections between different systems that were not previously interconnected.

These are all things that are common within a distributed control system for any process application within the nuclear context within 50.59 context. It makes it difficult to demonstrate that a modern distributed control system does not create an accident with a different effect or malfunction with a different result. And it makes it difficult to say that well, if I'm screening in that it's not adverse.

So there's a lot of consideration for digital to make it more challenging than other

disciplines when it comes to the basic 50.59 process as described in NEI 96-07 which was ultimately why Appendix D was created to try and address why is digital challenging and how to refine the guidance for the base 50.59 guidance specifically for digital considerations.

MEMBER RICCARDELLA: So I can I --

CHAIRMAN BROWN: Can you calibrate that just a little bit? Take the -- there's two chillers in the main -- for the main control room, I guess, the examples that are used in Appendix D. Today they're separate. You've got a box over here, a box over here, they have their own controls. They operate independently, totally. One of the thought processes you can combine the controls for those two chillers, the functional and mechanical parts, into one processor control them both.

Now I've got shared resources, if you want to call it that. I've combined everything. So now a single failure can take out both of them and you may or may not realize it at the time, you know, it can be not obvious. And now you're in trouble.

MEMBER RICCARDELLA: So that would fail the 50.59 --

CHAIRMAN BROWN: That would --

MEMBER RICCARDELLA: -- test. And therefore, would have to -- that change would have to come in for a license amendment?

CHAIRMAN BROWN: Well, I --

PARTICIPANT: In theory.

CHAIRMAN BROWN: In theory. If that's a safety related -- I think, is that a safety related system with chillers in the main control room? I'm trying to remember it right now. So that's a safety related system because you got to keep relay rooms cool and you've got to keep I&C stuff cool. I mean, you -- that's in -- and people cool. So that's where that one comes into play.

But you've got other non-safety related systems where they have two sets of stuff. Is it okay to combine those now because they're non-safety related and if you -- now you look at other -- you can look at other, what is it, qualitative assessments of whether the -- what's the impact going to be? So that's where this stork dance gets pretty convoluted. You wanted to say something, Dennis?

MEMBER BLEY: For Pete, when you have the two separate ones, the analog or whatever we're talking about, the kind of things that introduce common cause failures are common maintenance. The

same guy does maintenance on both of them screws it up the same way. A lot of examples of that sort of things, or wear out problems where they -- both age at about the same rate.

CHAIRMAN BROWN: Or a particular component may be a less reliable component and it's in both things --

MEMBER BLEY: It's in both --

CHAIRMAN BROWN: -- and they both failed, theoretically, at the same time. You've got to --

MEMBER BLEY: Within a narrow enough window to take them both out.

CHAIRMAN BROWN: Narrow enough, exactly. So you were -- somebody was going to say something when we were --

MR. MCKENNA: I was just going to mention we'll get on in -- later in the brief. But the qualitative assessment is assessing whether -- what the likelihood of failure of that component is. And if it's a low likelihood of failure then you go ahead and pass the evaluation course under the 50.59 without a license.

MR. BEAULIEU: Can I shed some light on this? Because what -- you guys ask great questions. It boils down, what really makes digital different?

And primarily, it's not the wires connecting the systems because you could buy insulation devices. It's software. So why is software different? Okay. It's different because it's -- writing software is very prone to human error. Like, you type in a Google search. If you don't type it in exactly, it -- you're not going to get the result. It's very prone to human error. Okay. So you know the errors exist. And --

MEMBER BLEY: Sure.

MR. BEAULIEU: -- you can't test them. It turns out you can't comprehend -- for, unless it's the simplest of system, it turns out there are so many different combinations, it would take years or computer, you can't test every combination to identify all the errors. So now you're end up -- you -- so now you have, now you know you have errors. You don't know exactly where they are.

And now you have to answer a 50.59 question. Say, is the likelihood of failure of that component any worse than the analog system? And just like well, how do you know? You don't know where it -- really where the errors are or where they're going to appear. You just know that if both redundant trains receive a common, a similar input, they're going to fail at exactly the same way, at exactly the

same time because they don't wear out. They just -- they're going to fail to -- so that's what makes digital different.

You have -- so it's not that software is unreliable. It's the fact that you just can't write that in your 50.59. Say, oh, software's pretty reliable. You need to have a basis. You need to describe why this software is not going to fail any more likely then -- and that's where this qualitative assessment comes in. There was no standard way of documenting the logic of how you determine how the likelihood is and to be able to answer the 50.59 questions.

MEMBER RICCARDELLA: But isn't the bigger concern how you do the design, not the 50.59, but all these things we're talking about really effect how you design the digital equipment? And I'm assuming is IEEE standards and other things that give guidance on that. I mean, to me that's a much bigger concern then whether you come in for a license amendment request or not.

MR. WATERS: I think that's correct and when Wendell gets his presentation, that was a big focus of what are the areas you look for quality of assessment. Design features is the most important

one, I would say, for us. What -- from really general terms, right. What are key design features to take credit for and consider for quality of assessment as well as the quality processes which may be, you know, rely on some filing codes and standards.

So you're absolutely right. That was part of the conundrum here we had is it's easy to say it's common cause failure, sufficiently low. But what does that mean from a design and ethological approach and make that determination? That's how we got here today.

MR. MORTON: And we'll -- and we'll get to that slide when we talk about the RIS Supplemental where we actually speak specifically about the engineering evaluation portion of it as it relates to supporting the overall 50.59 evaluation.

MEMBER RICCARDELLA: Thank you.

MR. MCKENNA: So I moved ahead to the next slide which just introduces the RIS 2002-22, Supplement 1. We'll discuss it more towards the end of the presentation, but needed to introduce it here.

So the Supplement 1 gives the clarifying guidance for preparing and documenting a qualitative assessment which is mentioned in NEI 01-01. It does mention it right in the RIS supplement that it is not

for replacement of the reactor protection system, not for replacement of the engineered safety features actuation system and not for modifying the internal logic of RPS or FSAR.

MEMBER BLEY: And that means if you're going to do one of those three you have to come to the staff?

MR. MCKENNA: It means that you can't use a qualitative assessment to -- yes.

MEMBER BLEY: All right. Okay.

MR. MCKENNA: Yeah.

CHAIRMAN BROWN: Well --

MEMBER RICCARDELLA: It doesn't mean you can't do digital?

MR. MCKENNA: Well, again, any licensee can start the 50.59 process for any modification they want to do. In the end, the end result would be if you're going to modify your reactor protection system, you're coming in for a license for that. Not to prejudge it, but --

MR. MILLER: Or come up with some other method -- this is Chris Miller. Or come up with some other methodology that we would find acceptable.

MR. MCKENNA: Correct.

CHAIRMAN BROWN: The RIS didn't say it's

not for replacement. That, those are kind of interesting words. I'm just now reading it. It says the RIS supplement is not directed toward reactor protection systems and safety, safeguard systems or -- I've got to use the exact words.

MR. MCKENNA: I thought it used the exact words, but you may be true, sir.

CHAIRMAN BROWN: I'm just pawing through it. I just have this uncanny interest in --

MEMBER SKILLMAN: It's on Page 2 of 5 in the second paragraph. I would like to ask a question while you're rummaging through your paper. I thought that this RIS Supplement is the -- is so well written that it should be applicable beyond digital. And so I'm wondering why it seems to be limited.

CHAIRMAN BROWN: What do you mean by beyond digital?

MEMBER SKILLMAN: This RIS Supplement is intended to address digital modifications, but may be used for modifications for non-safety related systems at the discretion of the licensee. It seems to me that the tone and the thoroughness of this could be used anywhere in the plant. So it just seems to me that it's more, it could be more broadly applicable then the way the RIS describes itself.

MR. WATERS: It -- it had to do, there's a history behind here. I mean, I don't think staff would disagree. When we developed the RIS Supplement, we like to get State Colder feedback and there was, frankly, a concern that maybe there's -- some of the guidance would not be appropriate for even lower tier, non-safety systems where everything's well. So, you know, or -- and we believe it was not an appropriate for a reactor protection system during the safety check system. But we did not want to be so absolute on either side of the spectrum to prohibit it or allow it.

So those are words that we chose and you can use a RIS for a non-safety digital modification. I think the concern expressed by State Colder is when you go through it, you have to do everything in there to address it for those type of systems. And this is the language we fell upon to explain both the non-safety and the other end of the spectrum for reactor protective systems. Did I say it correctly, Wendell?

MR. MORTON: That's correct.

CHAIRMAN BROWN: I will probably comment later. One of the examples in Appendix D, since we're talking about the RIS right now, and in the RIS -- I

mean, excuse me, in Appendix D, there's a statement up in the beginning of Appendix D that's more, far more explicit, that says the qualitative assessments are not to be used for reactor protection and safeguard systems. But yet, the last example is a replacement of a reactor protection system where they caught that qualitative assessments reaching a not -- what's the term for not adverse, it's the other words about it's not --

PARTICIPANT: Sufficiently low.

CHAIRMAN BROWN: Not sufficiently low. Thank you. And therefore, it defaults to the LAR routine, I guess. So I was interested -- you don't have to address it now. It just seemed to be that NEI's own example after they said it's not to be used, all of a sudden one of the examples uses it.

MR. MCKENNA: Yeah, I --

CHAIRMAN BROWN: So.

MR. MCKENNA: I think what they're trying to demonstrate there is, again, you can use 50.59 for any modification you're going to make in the plant and the end result could be that you have to submit a license amendment.

CHAIRMAN BROWN: Yeah. Well, it did come to a conclusion, but it was based on a qualitative

assessment, not an -- it was part of the evaluation but yet they used the words qualitative assessment as arriving at the not -- what was the word again? Sufficiently low. Thank you.

MEMBER BLEY: Even though at the top they said you can't use it for the --

CHAIRMAN BROWN: Exactly. But way up in the beginning of the Appendix. It's a little bit of an inconsistency, so.

MR. RAHN: I could -- this is David Rahn, out of the Office of NRR. I could shed a little bit of light on this is that the original thought on the RIS was it's to clarify a previous RIS which was describing what was covered in NEI 01-01. NEI 01-01 does not outright prohibit using the guidance in NEI 01-01 for safety related modifications like the RPS and SFAS.

But what it does say is that if you attempted to do so you would likely run across problems in responding to some of the 50.59 evaluation questions. And the likelihood is that you wouldn't actually make it all the way through the system. And that's why the RIS used the words it's not directed towards, still this time, some modifications mainly because the likelihood of actually going all the way

though without problems is not high likelihood.

So we use the terms -- it's not directed towards those and one could really attempt to use the RIS and NEI 01-01 guidance for doing this type of modification. But -- so anyway, I just wanted to make sure that's the nuance on the word --

CHAIRMAN BROWN: That is -- it's an interesting nuance you have there.

MR. RAHN: Right.

CHAIRMAN BROWN: It's -- because of the protection system -- and I'll just say it right now. You can't -- obviously, this is not a rule. But you just say it's not directed at or you can't use the qualitative assessment to assess or evaluate reactor protection systems. It just seems like you ought to make a flat out statement that you need an LAR to replace reactor protection system. You don't have to say you must -- you're required, but you can say you should submit an LAR for protection systems and safeguard systems.

I can't even conceive of having a licensee replace an entire protection and SFAS system, the electronics part of it, under 50.59. I just -- but yet, it's not prohibited, if I'm not mistaken. Am I correct? Did I say that right?

MEMBER BLEY: Kind of saying you're wasting your time is the way I took that.

MR. WATERS: Again, nothing is prohibited from using 50.59. The end conclusion is going to be you're going to have to submit a license amendment.

CHAIRMAN BROWN: Well, but you had the circumstance where people evaluated it that it didn't need to be submitted, and therefore, nobody found out for a while. I can't imagine. That's pretty big extensive replacement, so hard to be -- it's invisible.

MR. MORTON: If you're referring to some of the examples we had earlier in the presentation, that's why the clarifications for the screening and evaluation are being made to help licensees not make those particular mistakes when comes to --

CHAIRMAN BROWN: I understand that point.

MEMBER BLEY: You know, that -- just on the surface looking at the Criterion 6, if you're doing that big a replacement --

CHAIRMAN BROWN: It seems obvious.

MEMBER BLEY: -- saying you're not going to introduce anything new just, you'd never be able to show that on here.

MR. MCKENNA: So member Bley --

MEMBER SKILLMAN: Could I ask this --

MR. MCKENNA: Oh, sorry.

MEMBER SKILLMAN: So the RIS allows the qualitative assessment. What attention is given to the credentials, but more importantly, the qualification of the individuals, the author, that qualitative assessment? Because to me, that's where the, that's where the quality is provided --

MR. MCKENNA: So a --

MEMBER SKILLMAN: -- in the argument.

MR. MCKENNA: So licensee would have their own qualification process for people who are allowed to do modifications and write 50.59s. And they'd also have peer reviewed.

MEMBER SKILLMAN: Is that inspected? Do the NRC residents or special teams approach those --

MR. MCKENNA: So that would certainly be part that you --

MEMBER SKILLMAN: -- qualifications?

MR. MCKENNA: -- sample in doing an inspection, right. The qualification of the person who perform the 50.59. Yes, sir.

MEMBER RICCARDELLA: Is the 50.59 subject to 10 C.F.R. 50, Appendix B, quality assurance requirements?

MR. BEAULIEU: The mod itself is.

MEMBER RICCARDELLA: The mod is.

MR. BEAULIEU: The date of assessment is part of the mod and so the --

MEMBER RICCARDELLA: Okay.

MR. MCKENNA: So when we do a modification inspection in the field, it covers the design of the modification and the 50.59 process. It covers both of those areas.

MEMBER RICCARDELLA: Thank you, again.

MR. CARTE: This is Norbert Carte. One dimension -- so you could change a non-safety system. So Appendix B would not apply.

MR. WATERS: This is Mike. I just want to help answer the question from a different angle. I -- our focus was not on the credentials or expertise of the licensees. They have the expertise. I think the issue was even if two competent individuals you reach the same conclusion for digital modification. So we focus more on what things you look at. What type of documentation do you need to have a -- lead competent people to the same conclusion whether it passes or not the threshold. So that was really our focus, was how do you get a documented result and address the right things to come to those kind of conclusions?

MEMBER SKILLMAN: Yeah, fair enough. I wasn't trying to be pejorative. It just seems to me that when one talks about a qualitative assessment you see this group of people at a licensees' headquarters or at the site. Sometimes you wonder, do those individuals really know what they're doing?

MR. MORTON: So as part of the construction creation of the RIS, Supplement 1, we tried to take into account let's not make this too complex. Let's keep it pretty straightforward. Look at the issue that we've heard from our licensees and from our inspectors and from general staff. On the areas we've had concerns of 50.59 screening and evaluations when it comes to digital. So the documents informed from that standpoint.

Because we try to take into account that perspective of folks who may not necessarily be a specific expert in either the technical side or the licensing side. But to be very clear and concise on the expectations we have with this RIS, Supplement 1. So we try to take that respect into account as well.

MEMBER SKILLMAN: I think one of the challenges is if a licensee is going to change any kind of control system that was supplied by the NSSS vendor. the thinking, the NSSS vendor, the metal

framework and the designer's mind's eye is not easily duplicated at the site or at the applicant's headquarters.

And so very often their -- the intentions are noble, but the product might not connect with what had been, if you will, the original functional performance requirements of the protection system that the NSSS vendor was trying to implement. A lot of that's very subtle and unless the individuals are doing the qualitative assessment have some at least sensitivity to that, an important feature or important features might be lost.

MR. MORTON: So one of the things we clarified. I want to come -- and Norbert referred to this in terms of our documentation aspect. We really tried to nail home within the RIS, Supplement 1 is to -- you need to understand what you're putting in your plant.

You need to understand the specific design features of the widget you're trying to install and the particular failure modes of this particular device you're trying to install. And how you're compensating for those particular failure hazards within this system with some sort of compensatory measure within the system, self-testing features or any sort of

independence or redundancy of which you're crediting against that particular device's failure.

So as part of the failure analysis to support the engineering evaluation that you're using to perform the qualitative assessment, we tried to cover all those different bases on where you're looking in the actual engineering aspect for potential hazards when you're installing digital networks, potentially creating new types of accidents, for example, especially if you're combining multiple different system functions on the same platform. We point those hazards out in very specific bright detail.

And then that's where -- with the intention of documenting what those hazards are as part of your 50.59 overall evaluation during the qualitative assessment. So we try to take that into account to make sure hey, we covered a technical aspect of it, potential hazards you may be introducing. Alert you to what those potential hazards could be and what you should be supporting in an engineer technical evaluation. And documenting them so that we're insuring you're meeting the D1 requirements for 50.59 by documenting what you should be.

MEMBER SKILLMAN: Okay. Thank you.

CHAIRMAN BROWN: Before we go on, did you have something else to say on this?

MR. MCKENNA: I was just going to recommend that this would be a good spot for break.

CHAIRMAN BROWN: I'm way ahead of you. I'm probably older than you, so -- we will take a 15 minute break, come back at 10:20, so we're recessed right now.

(Whereupon, the above-entitled matter went off the record at 10:01 a.m. and resumed at 10:20 a.m.)

CHAIRMAN BROWN: The meeting will come back to order, and you may proceed now.

MR. MCKENNA: Sure. So now, we'll get into the part where we'll brief Appendix D. So that's the introductory slide, we'll move on, backwards. Okay.

So like we have discussed in previous discussions, Appendix D, the RIS 2000-22 Supplement 1, gives the technical aspect of digital INC modifications, not the 50.59 process. So that is why Appendix D was written, to give the 50.59 process for digital INC modification.

CHAIRMAN BROWN: Excuse me, Appendix D

then is the process and the RIS is the technical part? You talked about --

MR. MCKENNA: That is correct.

CHAIRMAN BROWN: -- technical advice evaluation process.

MR. MCKENNA: Right. So Appendix D is written in the same format as 96-07, so the paragraphs actually align.

CHAIRMAN BROWN: Yes.

MR. MCKENNA: So it's supplemental guidance for 96-07.

CHAIRMAN BROWN: Okay.

MR. MORTON: But I do need to make one nuanced clarification to, in addition to what Phil said, the RIS supplement does not provide screening guidance. It's specifically for the evaluation portion.

CHAIRMAN BROWN: Yes.

MR. MORTON: Just, just make it clear.

CHAIRMAN BROWN: Well but the RIS talks about qualitative assessments --

MR. MCKENNA: So the qualitative assessment portion is used --

CHAIRMAN BROWN: That, that --

MR. MCKENNA: -- so you can pass the

evaluation questions.

CHAIRMAN BROWN: So that is -- but, but yet, well how do you ever get to the -- I thought the assessment, I thought you did. You had to do an assessment before you get to evaluation.

MR. MCKENNA: You do screenings --

CHAIRMAN BROWN: Screenings also involve qualitative assessments.

MR. MCKENNA: The qualitative assessments --

CHAIRMAN BROWN: Qualitative assessments also --

MR. MCKENNA: It's not used for the screening portion. So you can --

CHAIRMAN BROWN: But -- well, well, how do you do a screening then? Sit around and --

MR. MCKENNA: So this is what Appendix D will cover.

CHAIRMAN BROWN: Yes.

MR. MCKENNA: Appendix D covers the screening portion of 50.59.

CHAIRMAN BROWN: But I read the screening portion and it certainly looked like you were making qualified --

MEMBER BLEY: I think you were doing

qualified judgment, but he's going to tell us.

CHAIRMAN BROWN: Okay.

MEMBER BLEY: I think.

MR. MCKENNA: Remember for the screening portion, you're only deciding if the modification is adverse or not adverse. Right?

CHAIRMAN BROWN: But there was qualitative assessment to do that. That's the way I read it.

MR. BEAULIEU: You're correct in -- it, the initial part, it, it does deal with the same aspects that are covered in the qualitative assessment. However, it had some additional considerations that give you an additional degree of confidence that, that goes beyond just the qualitative assessments.

It has to be like very simple design. It has to be, I forget the additional considerations. But you're right, the way it's written, it kind of uses qualitative assessment as a starting point. But you need greater assurance than that.

CHAIRMAN BROWN: Well isn't that section of -- I'm going to skip a little bit here because then, I, I really, I've really kind of get a feel for how we get this screening done relative to that. Because Appendix D leaps into and adds a new section

3.15, which is largely determining whether you're sufficiently low.

It's a qualitative assessment, what the title is. And then you get down and you determine whether you're sufficiently low or not sufficiently low, or what have you through the screening. But, and then, the screening process follows in section 4.2.

MR. MCKENNA: So maybe this is a good clarification for, in the rule, the only documentation required is the --

CHAIRMAN BROWN: Is the 50.59.

MR. MCKENNA: 50.59 rule is the evaluation.

CHAIRMAN BROWN: I got that part.

MR. MCKENNA: Okay. So if you do a screening and you're using the qualitative assessment portion of the screening, that documentation is not required to be retained.

CHAIRMAN BROWN: Is not required to be what?

MR. MCKENNA: Be retained. So it's part of the rule. So you're screening as adverse or non-adverse.

CHAIRMAN BROWN: Okay. But when, if --

MEMBER BLEY: So if, a just thought. If

you don't retain that, then you can't inspect, the NRC can't inspect to see if they did a reasonable job of screening. I don't think. Short cut -- or don't you even inspection?

MR. MCKENNA: So I'll -- I don't want to backtrack here, but I will backtrack a little bit. So all, all licensees keep the screening portion. It's in their procedure.

CHAIRMAN BROWN: That's what I would think.

MR. MCKENNA: Yes, yes.

CHAIRMAN BROWN: But you're just saying, the rule doesn't --

MR. MCKENNA: The rule doesn't required it. Right.

MEMBER BLEY: The Appendix.

MR. MORTON: Let me turn to something that Charlie was or Member Brown was asking. Don't, please don't confused with the engineering judgment/qualitative assessment you may be doing to determine whether a modification is adverse or not with the qualitative assessment as endorsed by the RIS Supplement 1.

CHAIRMAN BROWN: Yes. The RIS Supplement applies to the evaluation itself. Correct?

MR. MORTON: Well --

CHAIRMAN BROWN: I got that --

MR. MORTON: -- you're making an engineering judgment/qualitative assessment in the screening section, but it's just to determine whether the modification is adverse or not.

But they are different criteria in screening that aren't necessarily covered by the RIS Supplement 1, which is why we tried to be very clear that it is not specifically for the screening portion of 50.59. So I just wanted to clarify that point so there wasn't confusion that it applies to the entirety of the process.

MEMBER BLEY: So that's the C2 one to eight issues?

MR. MORTON: Correct.

MEMBER BLEY: That's the evaluation.

MR. MORTON: That's the qualitative assessment as per RIS Supplement 1, the 2002-22.

MEMBER BLEY: Okay. Evaluation?

MR. MORTON: Evaluation.

MEMBER BLEY: That's the evaluation process --

CHAIRMAN BROWN: Don't you have to look at those as well to see if you can screen it?

MEMBER BLEY: You don't have to.

CHAIRMAN BROWN: How do you decide if it's adverse?

MR. BEAULIEU: No because the weight, I sorry, repeating here a -- the reason the screening guidance is, just deals with the direction of, of, the change in terms of, can it have an adverse impact on the ability of the system to perform its design function?

Some changes have a positive impact. So, so you, it's that. So the screening deals with the direction. Is, is it positive impact or negative impact on the design function?

And if it's, if it doesn't have a negative impact, then it screens out because there's no way that, that any of the evaluation criteria could be tripped.

MEMBER BLEY: I'm sorry but the, the criteria that you use for evaluation, the eight criteria from the rule, if you don't ask those kind of questions when you're doing the screening, you might not see that it was adverse. I mean those are kind of general issues that you're trying to see, could this move it into a bad direction?

MR. BEAULIEU: I suppose you could --

CHAIRMAN BROWN: I tried to use, I tried to use their examples to get a feel for this. They've got several examples under the screening section. And if you look at -- this is me talking now relative to this and I've got it open.

They talk about the screening response, digital transmitters use a relatively simple digital architecture. Well that's, that's the same kind of thought process --

MEMBER BLEY: Simple.

CHAIRMAN BROWN: -- I would use in a evaluation, also. But I mean, it's, it is, it is not a detail, it's just, I mean, you can have very simple digital components, which with a limited programming set that are fairly, that their architecture's pretty straightforward.

And then, then they look at failures of the device that were encompassed by the failures of the existing analog device. In other words, it can't file, fail differently than that one.

MEMBER BLEY: Right.

CHAIRMAN BROWN: But yet, if you look at the rest of the paragraph. It certainly looks like you're evaluating it from a -- there's qualitative thought processes in there. And you know --

MEMBER BLEY: Yes, yes, I keep going back to the C2-6, which is introduce a new failure mode. Very simple system could introduce a new failure mode.

CHAIRMAN BROWN: Absolutely. I guess --

MEMBER BLEY: Yes. So you must be using that structure. We'll talk to the guys who represent the people who do this.

CHAIRMAN BROWN: Any way, I just, I just was trying to get a feel after reading any 96-07, the Appendix D, the RIS, and there was oh, the Reg Guide. I was trying to figure out then, and say, okay, how to do parse screening from evaluation? And I --

Seemed to me screening was a qualitative thing, but I want the assessment, as well. And the 3-15 was set of qualitative -- how do you do a qualitative assessment.

Then you come along later in your Reg Guide and say, throw 3-15 out. We don't recognize that. The only qualitative assessment we recognize is in RIS Supplement 1. Well does the 3-15, is that not for the adverse? Or was that meant in the Appendix D to apply to the evaluation part, 4.3?

MR. WATERS: So I mean, I think you're, you're right. Technically speaking, the screening portion is a qualitative judgment. Is it adverse or

not? From a process standpoint, under 50.59, you know, a plant makes thousands of changes from small piece parts to bigger ones.

And the question is, then you do a full 50.59 evaluation, it's only criteria for every single change they make. So part of the process would be, we've adopted under, by endorsement in 89607, before digital was the ability to screen things out from that full evaluation, the criteria being is it adverse or not.

I think you are correct. It is a qualitative judgment and in day. But you've picked up on a struggle we had in this, this guidance here. Is, what, what does it mean to be adverse for dozer modification?

I think we started from a standpoint, from a conservative standpoint where if it was digital, usually screened in, you had to run the full evaluation, even if it was small, small digital piece. So part--

Part of what we did in working with our endorsement review in Appendix D is, what digital modification can screen out because we're not adverse? And have you ran a full evaluation?

But you're right. We, we reserved the

term qualitative assessment only for the evaluation portion of the 50.59. Not for the screen, not for the screening portion.

CHAIRMAN BROWN: Yes.

MR. MCKENNA: And, and one of the goal's again for Appendix D was to remove the regulatory uncertainty. And right now, there's no screening guidance out there. So putting a screening guidance into Appendix D removes some of the regulatory uncertainty.

MR. MORTON: Right. And as Mike was alluding to, one of the clarifications made, not clarification in the Reg Guide, but what's actually written I believe in that section that you're looking at, is just because it introduced the software, the modification doesn't necessarily mean it screens in, doesn't necessarily mean it's adverse.

So some of the criteria you're looking at in terms of a simple device, a small amount of input/output, these are ways to add additional criteria to determine well, okay, it may have software, but it may be simple, highly testable, something to that extent.

And it may be not necessarily be at adverse. So that's what we're referring to. And

that's generally an engineering judgment of qualitative assessment. So really we don't disagree with that.

CHAIRMAN BROWN: Okay. Well 4.2 was fairly, in the original 96-07, non-Appendix D, the regular 96-07, very, very generalized. I mean, does the activity decrease the reliability of an SSC design feature? Well that's kind of a, that's kind of -- you have to sit there and think about that.

MEMBER BLEY: Charlie, you've got somebody wanting to talk. Excuse me.

MR. LEBOND: Hi, I'm Peter LeBlond and I'm here primarily with Neil to talk about the 436 discussion. But perhaps, I can assist. I was one of the authors of the original 1999 rule change.

First, sufficiently low, not sufficiently low, it's really a surrogate for the language of creating a possibility that's used in criterion five and six.

MEMBER BLEY: Now is this screening or --

MR. LEBOND: No, this is the evaluation.

MEMBER BLEY: Okay.

MR. LEBOND: So, so when the folks say, well not sufficiently low is primarily used in, in the evaluation phase, it's really used as surrogate to, to

answer the, the sub-element of criterion five and six, create a possibility.

If it's sufficiently low, then from a legal standpoint you can say it doesn't create a possibility and the issue of what a different result is doesn't come into play. So --

CHAIRMAN BROWN: And an LAR is not required?

MR. LEBOND: Correct. Yes. In four --

CHAIRMAN BROWN: And I got that.

MR. LEBOND: -- five and six, it may be required for one or the other criterion.

CHAIRMAN BROWN: But that's a different circumstance.

MR. LEBOND: Different, different issue, right. Right. Right, another rabbit hole. Okay. So it's not used, that concept as Wendell and Phil were saying. And they're right, it's not really used in the screening process.

However, in 96-07, there is a statement that was expanded upon in Appendix Delta. It says, for those changes that introduce the possibility of a new type of action or malfunction, they screen in. And that is 421, if memory serves, and that's 96-07.

And on 4211, it repeats that logical

Appendix Delta that says, if you put software into redundant systems then the assessment that you're talking about is just a go, no go.

And the reason for that is because the process doesn't handle when you say, adverse impact, on a design function. Well if you introduce a new possible hit on five and six, screening can't handle it.

So you've got to disposition it under five and six. And that's why the language was there in the original 96-07. And that's why it's a go, no go in Appendix Delta. Once you put in software, into a redundant systems it says, --

CHAIRMAN BROWN: That was in 4.2.1, you said?

MR. LEBOND: I'm looking at the second paragraph under discussion 4211. On this basis, most digital modifications, redundancy systems are adverse. And that expands in that one sentence that's embed in 4.21 of 96-07 for the reasons we've been talking about.

CHAIRMAN BROWN: What paragraph is that?

MR. LEBOND: Second paragraph. I'm on, copy, I don't have my --

CHAIRMAN BROWN: I've got it open, so at

4211. Right?

MR. MORTON: Well at open at --

MR. LEBOND: 4.211, discussion for redundancy safety systems.

MR. MORTON: Charlie, I don't want to interrupt, I just want to clarify for the record. Mr. LeBlond is not a member of staff.

CHAIRMAN BROWN: I know.

MR. MORTON: Okay. I just wanted to make sure.

CHAIRMAN BROWN: He's an industry --

MR. MORTON: Yes. Okay.

CHAIRMAN BROWN: -- industry person. I'm not, I'm not in any --

MR. MORTON: That's, that's fine, sir.

CHAIRMAN BROWN: I understood that.

MR. LEBOND: Well I'm not taking issue with anything anybody said, so --

CHAIRMAN BROWN: No, that's, that's fine. You're allowed to talk.

MR. MORTON: But we're not either. I just want to make sure that's clear.

CHAIRMAN BROWN: No. I, I get that. I'm just trying to find what he said in 4211 of Appendix, I'm looking at -- oh I'm sorry, I'm not

looking at Appendix D. I'm looking at the original 96-07, not the -- so you say that was amplified then in Appendix D?

MR. LEBOND: Okay, the sentence that I referred to in 96-07 is buried. The sentence -- I don't have a copy of 96-07 with me.

CHAIRMAN BROWN: I --

MR. LEBOND: But embedded in a larger --

CHAIRMAN BROWN: Okay. Yes, I see. It's the second paragraph under the use of software.

MR. LEBOND: -- paragraph there. It's one or two sentences embedded in --

CHAIRMAN BROWN: Yes. I got it.

MR. LEBOND: Okay.

CHAIRMAN BROWN: I know I read through that, but I guess I didn't highlight it. Okay. I just -- obviously I'm sitting out here on the edge. Glad I don't work in the plants. I'd fail open.

MR. MCKENNA: So the next slide is, is, we've already hit a lot of these bullets. But this is how we develop their, or discussed with NEI along the road of submitting the document and holding the public meetings, and how we got to this point right now.

Chris Miller covered this in his opening set of remarks. So we received the Appendix D back on

November 30th and request for endorsement on January 8th, after our initial public meetings over the past two years. Wrong way, yes --

Okay. So this is what Member Brown has already started to discuss, the screening section of Appendix D. Again, the scope of digital modifications can be software related. They can be hardware related. They can be Human System Interface related activities. Again, the goal of screening in 50.59 is to reach a conclusion of non-adverse or adverse.

And again, what Member Brown had mentioned already was some of the things that are written into Appendix D are the same criteria that we would use in the formal qualitative assessment portion if we were to get a screening of non-adverse and moving on evaluation portion of 50.59.

CHAIRMAN BROWN: You said that you screened as non-adverse?

MR. MCKENNA: If you --

CHAIRMAN BROWN: And move on to the evaluation? You, you only do that if you're --

MR. MCKENNA: Sorry, I had I had it backwards. Yes, if you're adverse.

CHAIRMAN BROWN: I thought I heard the word.

MR. MCKENNA: Yes, sir. Yes, we would not throw it backwards. You heard me correctly. I said it backwards. Again so in the screening section of Appendix D. Some clarifications that the mere act of the combining functions or components and systems does not make the screen adverse. If it cause --

Obviously if it causes an adverse act on the design function then it would be adverse. And reductions in redundancy, diversity, or separation, or independence of the, in the SR design function would screen adverse.

The human factors section in Appendix D was -- NEI worked closely with our human factors personnel and NRC to develop that. And there's two steps in that, identify the generic primary task and mouth.

And then for all those primary tasks that you identify, assess of that, if the mod negatively impacts those primary tasks.

MEMBER BLEY: Let me take you back to the Reg Guide and read a sentence there. And I want to ask you a couple of questions about it. It says regarding Appendix D, it's understood by the NRC staff that screening human system interface changes is an exception from the guidance contained in 96-07 Rev. 1,

since HSI is not discussed in the document.

And then it goes on, digital is kind of unique here. I, I get what it says here. But if I have an analog system, the HSI is just as important as digital. And if there's no guidance in the base document it seems we're missing. We've got a gap here, unless you don't figure we'll ever get anything analog coming in again.

MR. CARTE: Norbert Carte. So 96-07 does have a statement that says that basically if you change the HSI it should come in, it should be evaluated. So there is --

MEMBER BLEY: It just doesn't tell you how to do it.

MR. CARTE: Right. It says, if you're changing the HSI, do an evaluation. In other words, it, it screens in and you do an evaluation.

MEMBER BLEY: Okay.

MR. CARTE: So what Appendix D does it allows you to do an actual screening of the change and make the determination. Rather than just saying, oh we changed something in the HSI, go do a full evaluation.

MEMBER BLEY: Right. Okay.

MR. MCKENNA: Now moving on to the

evaluation section of Appendix D. The evaluation section again, section 4.31 aligns with the main body of 96-07. Again it's the supplement, the guidance in the main body of 89, 96-07.

And for digital modification criteria one, two, five, and six are the evaluation criteria that apply for a digital modification. Criterion three and criterion four, which are sections 4.3.3 and 4.3.4 state that they provide no new guidance for digital modifications.

Section 4.3.6, does the activity create a possibility of a malfunction of a necessity important to safety for a different result? We will discuss this more in detail in the next couple of slides. Just highlighting some portion of Appendix D there.

There's a discussion on a design basis functions and the connection between the design basis function and the safety analysis result.

And the overall perspective out of section 4.3.6 is unless the equipment would fail in a way not already evaluated in the safety analysis there can be no malfunction of a necessity important to safety with a different result. The current words in Appendix D.

So for Section 4.3.6 there's a six step process. The process five and six which are

highlighted in bold are the ones that we take exception with in our endorsement in the Reg. Guide. I'll let you read through the six steps.

And then, I'll go down to steps five and six, which is, the way it's written in Appendix D is identify all the safety analysis involved and then for each safety analysis involved, compare the projected possible results with the previous evaluator results.

So from step five in that six step process, which I discussed, Appendix D states that if there's no safety analysis involved, then there cannot be a change in the result of the safety analysis. Therefore, the proposed activity does not create a possibility of a malfunction of an important safety of a different result.

We disagree with this in 4.3.6 in that it should determine the SSC malfunction instead of the impact of the result on the safety analysis as a facility on a whole.

MEMBER RICCARDELLA: That's a, that's a subtlety. Could you help me with that, please?

MR. MORTON: Member Bley talked about the example 4-19, about the radiation monitor example. That's basically, that example is essentially leveraging this piece of the guidance in Appendix D.

So the way that you could interpret that and the way they run through the six step process for that --

You have an analog system, software comment cause failure would not necessarily be part of its original licensing basis if it was an originally an analog system, then it was not digital.

So therefore, a software comment cause of failure would not have been part of the original failure analysis, FMA, or whatever. Analysis would have existed and wherever it would have existed in the FSAR.

If you are upgrading that particular system to a digital control system for this area related issued monitors, you -- at a minimum you would introduce one new particular failure by which is something based upon software, your software comment cause of failure.

The way you can interpret that particular guidance is that if you don't have a software based type of failure pre-existing within your licensing basis to compare against the similar type of failure. Then they're saying that there's not a pre-existing analysis talking about that. Therefore, it can't really be a different result.

And therefore, it's really a criterion two

issue, not a criterion six issue, which is part of the reason we took exception to both the example and that little note that's within the example because that's a kind of two, two for one deal in terms of guidance.

And we disagree with and took an exception to -- and then saying, that hey, this particular, in this particular modification, criterion six would not even apply or it would, it's really a reliability criterion two issue.

Sort of, sort around the discussion, back to what we talked about previously in terms of why we got to point with that particular example.

MEMBER BLEY: I think I agree with you folks.

MR. BEAULIEU: Could I elaborate on that? To it's an important question, that you indicated it's a subtlety. What's the difference between whether you consider a safety analysis of each individual SSC, which is the definition in which the regulations say? Or do you say it's a safety evaluation means just the plant as a whole?

That makes a huge difference because when you say, if there's different result, you're comparing the result. Are, are you looking just at the accident, Chapter 15 accident analysis, from, to

determine whether there's a different result?

Like, you know, do you compare everything to a large break LOCA and then if you don't, if you're within, if you're bounded a large break LOCA, there's not a different result? Is that what the Commission intended?

The answer's no because they could have written it. They could have written the regulation that way, but they didn't. They, they said, malfunction of an SSC.

So the SSC previously evaluated and most of the time those evaluations are, many times, they're in a failure modes and effect analysis is a table. It says, a pump, you have discharge valve. And if a --

Usually malfunctions are considered single failures. So, so in the failure modes and effect analysis, we'll say one train fails, and it'll say the effect of that is we're good.

We have redundant trains, 100 capacity, plant is safe. That's were that's a, that is where that is previously evaluated is in the chapter for that system. And often it's in the failure modes and effects analysis for that system. So --

So therefore, if you have a common cause failure, if you just assume the, there's a software

common cause failure, well that failure mode is -- that's a different result for every safety system. The --

Virtually every system, safety system, the system is credited in one way or another in the accident analysis. The thing is it might not, every system might not be explicitly described in the accident analysis.

The accident analysis might not describe control room chillers, for example. They might not describe, you know. So, so the regulation says anywhere previously evaluated in the FSAR, not the accident analysis.

Anywhere in the FSAR, that's what they're talking, that's, that's the really distinction between the two, which, which, what do you compare as a different result.

And it makes a huge, makes a huge difference in terms of, like what I said, preparing everything to large break LOCA. Is that what the Commission intended? No. And it's not what the regulation says.

CHAIRMAN BROWN: You guys went so fast that I lost the bubble on something. If you could, if not synopsis are not synopses. Can you go back Slide

26?

Here you say in 4.3 1, 2, 5, and 6 the criterion and discuss the use of the qualitative assessment outcome. So efficiently go -- now this is the evaluation part now, this is not screening? Correct?

MR. MCKENNA: That's correct.

CHAIRMAN BROWN: But yet in the document, they've got a section in Appendix D called -- again, back to 3.15, 315, rather 3.15. That was a qualitative assessment.

And you all pushed that aside and said only RIS 2002-22 was the only one we've evaluated in terms of doing qualitative assessments. Now is 3.15 applicable to evaluations? Or is it not applicable to evaluations?

MR. MCKENNA: So now I understand what you're talking about? So that's where Appendix D introduces the qualitative assessment. And does not speak about it anymore. It's only in Section 3.1.5 is where --

CHAIRMAN BROWN: Point .15 is that.

MR. MCKENNA: Right. Sorry. Yes. That's, that's the only place that Appendix D talks about it. But it's, like that qualitative assessment

is meant to be used in the evaluation process.

CHAIRMAN BROWN: And you all have said the only one we've recognized is the RIS qualitative assessments? So that effectively negates 3.15 from the Appendix D from being utilized as part of an Appendix D evaluation?

MR. MCKENNA: No. I believe Appendix D is -- that's where they're talking about the qualitative assessment process, in that section.

MEMBER BLEY: They say you have to do it. They don't tell you how in there.

MR. MCKENNA: Right. That, that is not part of the screening section. That is part before the screening section. So they're introducing the qualitative assessment portion in Appendix D there.

MR. MORTON: Right. So they introduce the concept of the qualitative assessment. One of the things you'll see with the Reg Guide is that originally there was reference to a generic qualitative assessment without putting context around what does that mean.

So one of the clarifications made of Reg Guide is to clarify RIS 2000-22, Supplement 1, is the qualitative assessment method that we have specifically endorsed --

CHAIRMAN BROWN: Well --

MR. MORTON: -- as applied to it.

MR. MCKENNA: So Member Brown, that's, that's in their definition portion.

CHAIRMAN BROWN: Yes. But the --

MR. MCKENNA: So they're defining --

CHAIRMAN BROWN: I'm, I'm reading your, your item D, and 1.187 Rev. 2. It says, you all, you provide additional guidance or a position, the names have changed from, from older Reg Guides. And so you quote a qualitative assessment.

This is a specific type of technical based engineering evaluation useful to 10 CFR 50.59 evaluations. Okay? And applying to one, two criteria, one, two, five, and six. Then you go on. That's, that's the quote.

Then your statement, gone on and say. The staff's position is that any NEI 0101 Section 5 is clarified. Is the only guidance the NRC has reviewed or endorsed. But when I read 3.15, it wasn't -- I mean, it was a qualitative assessment. It talked about doing a qualitative assessment. And it had, it was not just blank. But I -- I'm trying to see how, how the qualitative assessment in 3.15, if, it, has it been screened out? Not screened out, has it been

overwritten by your position in the Reg Guide?

MR. MCKENNA: Again 3.15 is only the definition section. It's not part of the process of 96-07.

CHAIRMAN BROWN: Let's go and look.

MR. MCKENNA: They're only defining the qualitative assessment.

MEMBER BLEY: I don't think there's anything in 3.15 that's --

MR. MCKENNA: It's not snap --

MEMBER BLEY: -- inconsistent with what's in the RIS.

MR. MCKENNA: It's, it's not a step in the Appendix D process. It's a definition in Appendix D.

MR. WATERS: All right. I, I think, well maybe, I understand the question correctly. But I think part of the history here is NEI, as authors of this documents, hasn't endorsed. They want to leave open the option that there may be than one way to do a qualitative assessment.

And one day they may have detailed guidance they may ask us to endorse. And they may have something else. So generally, the quality of the assessment is introduced in that manner. What we're generally saying is, the only one when we recognize

right now is the --

CHAIRMAN BROWN: Okay. Hold on.

MR. WATERS: -- the one that we have that is part of the RIS.

CHAIRMAN BROWN: Think back for a minute. You say it just says, it's a definition. But in the fourth, under the third paragraph.

It says, generally reassure, responsible assurance of a low likelihood of failure is derived from a qualitative assessment of factors involving the design attributes of the modified SSC, the quality of the design processes, and the operating experiences of the software and hardware used, product maturity, in service experience.

To me, that sounds like, here's some attribute that you have to assess. And but yet, you've said, no, RIS 2000-22 is a definition. I'm --

MEMBER BLEY: I think it's like we usually see in their documents. This, this is kind of high level. So if you do what's in the RIS, you will have done these things. They're saying, right now, they approve what's in the RIS.

If, if you want to submit something different that meets this criteria and see if the staff likes, you're free to do that. It's just a

little riskier for you.

MR. MCKENNA: I just want to again clarify that Section 3.15 is not a step in a Appendix D.

CHAIRMAN BROWN: I understand it's a definition. Okay. Yes. I understand that and then there's a discussion of it. All right. And then you might want to answer one other one for me. No, that's the wrong question. Where is it?

MEMBER SKILLMAN: May I ask a question?

CHAIRMAN BROWN: I'll, I'll wait until I get to the Reg Guide, 1.17. It has to do with human systems interface thing.

MEMBER SKILLMAN: May I ask, on Slide 29 you've identify the NRC's position that you're focused on the SSC versus the overall system response. What is the status of this disagree between the NRC and NEI?

MR. MCKENNA: So we've discussed this disagreement in every single public meeting we held in the comment phase of the guidance. And we, there's disagreement between the NRC and NEI. That's, that's where it stands. And that's why we have why have an exception in the Reg. Guide.

MEMBER SKILLMAN: So NEI will we hear from you a little later, what you're going to do with this?

MR. LEBOND: Yes.

MEMBER SKILLMAN: Thank you. Thank you.

MR. LEBOND: We're prepared to address those issues.

MEMBER SKILLMAN: Yes.

MR. WATERS: And so process wise, the next step is to issue the draft for public comment where stakeholders have an opportunity to comment on our endorsement review including this issue.

MEMBER SKILLMAN: Thank you, Michael.

MR. WATERS: Okay.

CHAIRMAN BROWN: So fundamentally, this particular thing, just to make sure I understand. This is just a, the disagreement is between whether you focus on the safety analysis for determining, determining whether something is sufficiently low, as opposed to not? I mean --

MR. WATERS: So, I mean, there's many ways to explain this. This is so, you got to realize, this is a modification where the first thing you're able to do is do a qualitative assessment to determine software common cause failure is sufficiently low.

If you can answer that question as it sufficiently low, you've addressed criterion six as an unusual, new type of malfunction. This goes into a

situation where you have a digital modification, I guess, in there for some reason you cannot demonstrate as a sufficiently low.

It may be a new type of malfunction. It may not result in different results. So the question is, what does is, what do we mean by different result. What, what do you compare? I think that's what Dave is trying to explain. In other words do you compare that they're all plant response level or at a system level?

Early on decisions, some interviews said, hey the minute we assume multiple trains though, we have a hard time answering this question as being a -- there's going to be different result. That's from the feedback we got. And why we focused on the qualitative assessment.

I believed NRC staff believes both based on our engineering safety judgment and what the commission intended, if you cannot demonstrate a common cause for a sufficiently low for these systems, and you may have a different result as far, at the system level, you know.

Two trains do not work, for example. It still may be safe. But that crosses a threshold where that safety demonstration should come to NRC for come

a license approval. And he may well show that multiple trains can fail and it's safe, but this is a threshold test wherein they should come to NRC for license, licensing approval.

CHAIRMAN BROWN: But that assumes that the multiple trains failing wasn't as part of the initial safety analysis, or FSAR?

MR. WATERS: Yes, I mean, I, I, and I don't want to speak and please correct me that. You know, we looked at a few FSARs and some say, for example, a chiller fails everyone starts. That, that could be the extent of the FSAR.

CHAIRMAN BROWN: Say that again. If a chiller thing --

MR. WATERS: If one chiller one fails, a second one will start and provide, provide the cooling. That could be the extent of what the FSAR says. It does, it -- and you know, that's, that's the basis. Okay?

CHAIRMAN BROWN: And therefore, if now both of them fail?

MR. WATERS: Well, that's --

CHAIRMAN BROWN: That's way outside --

MR. WATERS: -- that, that may be different results providing that safe, that design

function.

CHAIRMAN BROWN: Right.

MR. WATERS: You can still make a safety case that the show that is acceptable, but we believe that cross is the threshold requiring a NRC review for approval.

CHAIRMAN BROWN: Okay. So they were, they were -- okay, I think I --

MEMBER BLEY: But that's, of course, two different of kinds of safety analysis. In Chapter 15, you have an event and you have under the worst single failure.

CHAIRMAN BROWN: Yes.

MEMBER BLEY: If they did a PRA, you'd look at those combinations, but that's not what they're looking at. They're looking at the Chapter 15 kind of analysis.

MR. WATERS: Well in the --

MEMBER RICCARDELLA: So that's what I was going to ask. On Slide 29, on the first bullet, where you say safety analysis. Are you referring to the whole FSAR or, or just some specific portion of it?

MR. MORTON: Within the context of Appendix D.

MEMBER RICCARDELLA: This would

Appendix D?

MR. MORTON: Appendix D. When they're referring to safety analysis, they're really referring to your Chapter 15 or Chapter 6 asset analysis. Am I correct?

MR. MCKENNA: Yes.

MR. MORTON: And our interpretation of safety analysis, it's wherever the failure analysis for that SSC resided. It could be in Chapter 15, it could be Chapter 7, or Chapter 10 if you're --

MR. MCKENNA: Yes.

MR. MORTON: -- talking about temperature of safety chillers or 20 percent redundant two-channel safety chillers, for examples. That's the general gist of the difference is where you're actually analyzing for the different result to resolve criterion six.

CHAIRMAN BROWN: So your point, just to use your chiller example, if they combine the functions and they would both fail at the same time, they would, they would argue you can screen that out based on -- not screen it out, wrong term.

They could evaluate that it's okay and therefore, we don't have to talk to the NRC. You all would say that no, because the component, the system

has now failed. That's not -- the total system has failed, that's not considered in the accident or safety analysis. Therefore, you should come to NRC to get agreed with that.

MR. MORTON: Generally --

CHAIRMAN BROWN: Before you make the change.

MR. MORTON: Generally speaking, yes. And it's, in a pretty, strict concise way. If it was analyzed only for a single failure, the safety analysis Dave was referring for your two chamber end safety chillers, main control safety chillers. The safety analysis is crediting in an indirect way in that you still have one train of this particular --

CHAIRMAN BROWN: I, I got that point.

MR. MORTON: If, if you didn't account for both trains for being available in the original analysis, wherever that existed, then that would be a different result.

CHAIRMAN BROWN: And therefore, you should see it. But they wouldn't -- their argument would be that they can do the analysis and it shows that they don't care whether the trains are there or not, and so the six. For whatever reasons, it may be that there's no effect for four hours and 59 minutes.

MR. WATERS: Correct.

CHAIRMAN BROWN: People can bring in fans, they can open doors, they can do this, that, or the other thing, and everything's okay. Therefore, we can make the change without, without qualms and not bother the NRC. And you all saying, no, it's a different, within the -- actually within the --

MR. MORTON: -- within the act itself.

CHAIRMAN BROWN: The end result --

MR. MORTON: Right.

CHAIRMAN BROWN: -- is different. And therefore, you should cede it. And that's where your disagreement is.

MR. MORTON: Generally speaking, yes.

MR. WATERS: That's true and we --

CHAIRMAN BROWN: That sounds good?

MR. WATERS: That's true, we believe -- I think one thing you hear every other --

CHAIRMAN BROWN: Like Dennis, I've had hard time with this one. I was reading it --

MR. WATERS: I, I just want to reiterate that the reason we do the RIS is you don't get to the point in terms of common cause and sufficiently low by looking at other design features. We don't necessarily want to do a LAR review of chillers.

I mean, we're not seeking that, but if for some reason you can't determine it's not sufficiently low and that's a threshold that crossed, come in for an NRC review in theory. And hopefully relief should be simple. I think you'd make a safety case for that.

MEMBER BLEY: This is really I think I'm getting this, back to the eight criteria of 50.59 reading them essentially literally, which is where I think the staff has in reading them somehow more inclusively might be where we haven't heard from --

MR. MORTON: Right. So if --

MEMBER BLEY: -- folks yet.

MR. MORTON: -- yes, so if you look at the criteria in six language, it's, as described in the FSAR, is updated. It doesn't say a specific part of the FSAR you're looking it. It says, in the FSAR as updated. If you're taking a very little reading of the rule and FSAR interpretation.

MEMBER RICCARDELLA: So if you replace safety analysis with FSAR, you guys would be okay with it. Right?

CHAIRMAN BROWN: I, I don't think so. I think based on their other, I think based on the other texts that's in there, FSAR's a combination of nothing. It's just already covered. If they had

already covered the failure of both of them --

MEMBER RICCARDELLA: Yes.

CHAIRMAN BROWN: -- you know, in the overall FSAR --

MEMBER RICCARDELLA: Yes.

CHAIRMAN BROWN: -- and it was benign, then you would not care.

MEMBER RICCARDELLA: But it's the overall FSAR, as opposed to just the Chapter 15 portion of the FSAR. Right?

MR. MORTON: That would be correct. Now using the phrase safety analysis isn't and of itself a bad thing. If just when you get into the nuances of 50.59 world, what, what do actually mean by safety analysis. And that's where we part ways a bit with NEI on the point.

CHAIRMAN BROWN: Well the FSAR is what's quoted in 50.59.

MR. MORTON: Right.

CHAIRMAN BROWN: Not the safety analysis.

MR. MORTON: Correct.

CHAIRMAN BROWN: So --

MR. CARTE: Norbert Carte, NRC. One nuance -- so there are a couple of different things. So this change or these words are supposed to cover

any type of change. So what we're discussing is say two systems and what happens if you have CCF.

But there are other possibilities. And part of the problem with this language is if you create a condition that no one ever thought of there will be nothing in the FSAR that describes it. So it not just a question about if there's nothing --

The way this step five is written, if there's nothing described in the FSAR, then it can't be new, which is kind of crazy. So the whole point is if it's new, it hasn't been considered, it hasn't described in the FSAR.

So fundamentally, there's nothing in the FSAR to describe it. And, and the reason why look at it is in part to review that the methods they used to address are adequate.

MEMBER BLEY: I, Charlie, point of order. Is the staff asked or are intending to write a letter on this at this time, or this information now for some, something we'll dig into later.

CHAIRMAN BROWN: I, my general conclusion right now is until get public comments there's a number of issues that ought to be resolved before, that we shouldn't --

MEMBER BLEY: I'm more comfortable with

that if that's okay.

CHAIRMAN BROWN: Yes. I, I don't think we need to speak to this now. I just want to make sure we haven't adequate description of what their disagreements are so that when we see the resolution, we can go back and look in the transcript and see what our mindless comments were or something like that. To see if we really understood what we were talking about. So, no, but I think my -- after looking, going through all the paperwork and everything, it seems like there was enough here that we would have an information brief for the full committee meeting coming up in May. And then deal with this letter-wise after they finish the public comment routine. I was going to --

MEMBER BLEY: Thank you.

CHAIRMAN BROWN: -- discuss with everybody here after we finish this. But that was, that's --

MEMBER BLEY: It's just starting to weigh on me if we had to write something.

CHAIRMAN BROWN: Oh no, this would be very difficult to try sort all the -- we shouldn't be in the matter of sorting. We ought to let them sort before we try to make any pronouncements. I think they'll get enough of a sense of what we're thinking

by what we're saying, whether it's intelligible or not, is another question.

But they'll at least to get some point to see if we're asking enough questions, anyway. All right. I'm sorry to drag to this out, but I think it's important for us to kind of understand these nuances of what you think.

MEMBER SKILLMAN: I mean, let me ask this question. The plants that remain, are aged and many of the remaining plants are struggling to get parts. And in many cases, they're cannibalizing spares. In other cases, they're doing commercial rededications. To what extent have you heard from those stakeholders regarding this criterion six?

MR. WATERS: Well that's my colleague's crypt of hoorah (ph.) I, it's very good question. That's why we did the RIS supplement first to address this real time need in 2018-2019 for ops list of concerns for the vast majority of, you know, safety supports systems modification systems.

And the focus of that was determine a common cause that are sufficiently low and you can adequately address your criteria. For its Appendix D question and concerning the interpretation of a different result, I, I do not know right now what type

of digital modification could not be made because of that.

Or this interpretation is critical to digital modification. I have not heard a specific example. But if, if -- I haven't been to every meeting, if Phil or Wendell heard a specific modification, hey, we can't make this without this interpretation. You asked that question, so that's --

MR. MCKENNA: I don't think we're aware of any digital modification that would have gotten held up by criterion six.

MEMBER SKILLMAN: Thank you.

CHAIRMAN BROWN: Maybe I have submit an LAR for it.

MEMBER RICCARDELLA: Yes, but --

CHAIRMAN BROWN: It would not be --

MEMBER RICCARDELLA: -- I mean --

CHAIRMAN BROWN: -- it would just have to go through the process.

MEMBER RICCARDELLA: -- yes, but --

CHAIRMAN BROWN: By definition they would think that's being held up.

MEMBER RICCARDELLA: -- yes, I mean, that makes a significant difference in the schedule to complete a modification? Whether they have to do an

LAR or not?

MR. WATERS: Yes.

CHAIRMAN BROWN: Yes.

MEMBER RICCARDELLA: So it is eventually held up.

MR. WATERS: Again though, this, were not talking about protection systems per se. We're talking about other systems where we believe there is a pathway for the vast majority of the systems with the purpose of consideration, which we'll, you know, get to, to determine common cause for a sufficiently low.

You addressed the first part of criterion six and any type of malfunction. This, this is a question of whether or not, for some reason, you cannot for some reason answer that.

MEMBER RICCARDELLA: Okay. I see. Okay.

MR. MORTON: You can determine common cause for sufficiently low, but there were reasons for that. And now, I have to say the what if, what is the different result.

MEMBER RICCARDELLA: Yes.

MR. MORTON: We're trying to say is we don't, we haven't heard exact feedback of what type of digital modification we cannot determine common cause

that are sufficiently low. And a different result becomes that, that critical determination of whether or not it has to become a law review. Not --

MEMBER RICCARDELLA: Yes.

MR. MORTON: -- there may be some out there. We just haven't had that specific feedback.

MEMBER RICCARDELLA: You could fail --

CHAIRMAN BROWN: That's a much better --

MEMBER RICCARDELLA: -- and still this criteria and still go ahead with the 50.59, if you do that further evaluation.

MEMBER RICCARDELLA: Right. Some, you know, I think someone said, a while that Appendix D provides additional alternatives beyond CCF sufficiently low. And this is where we have this difference of interpretation on this criterion six, different result.

CHAIRMAN BROWN: Wouldn't, isn't there a way to categorize stuff? And this is, you know, again, this just my brain moving around. Are non-safety systems largely, couldn't they largely do what they wanted with non-safety systems? Why would you, why do you have to go through an evaluation to deal with non-safety systems?

MR. MORTON: Well part of the RIS

Supplement is we cover, as an example of modifications that should go pretty cleanly with the RIS without being a LAR, would be non-safety related modifications.

CHAIRMAN BROWN: Yes. I would think stuff like TG voltage regulators, governor's, a controller for miscellaneous pumps through the plant.

MR. MORTON: All those mods are things --

CHAIRMAN BROWN: Clean water control system. I imagine a feed water control system. I'm not, not, maybe not all the plants, but at least the PWRs, I would think that. Unless you put all, if it's a four loop plant, you put all of the controllers on one chip.

MR. MORTON: All those have modification card, generally determining --

CHAIRMAN BROWN: That's a total loss of feed water so you probably cover in an SR, I would think. Or some type of plant doing an accident analysis. I, I just, it just seems to me that there ought to be a way to categorize it. I'm, my thought process is to make it as easy as for industry as possible without compromising safety.

MR. BEAULIEU: That's, that's -- you're absolutely correct on the feed water example. In

fact, 90, 50.59 does not distinguish between safety related and non-safety related. It, because non-safety related systems can have a design function. So it, that's what, that's what the key is for 50.59.

But you're absolutely right. Like for feed water it's a non-safety related system, so therefore, it's not credited in the accident analysis. The system description assumes both trains fail. They don't, it assumes a loss of feed.

So that's already addressed in 96-07. It says that for a different result, feed water, you might not have a different result because it's already, the analysis of the plant already assumes a loss of both trains, so -- so they won't trigger a variance state.

CHAIRMAN BROWN: But, but you talked about it. It's a design function. But when we talk about a design function, is that a safety design function, or is that a plant operation, business type operation design function? I mean --

MR. BEAULIEU: Is the definition?

CHAIRMAN BROWN: Sounds -- design is a kind of all-encompassing type thing that covers every piece of equipment in the plant. So same if it's got a design function, then you have to go through some

type of an assessment or evaluation. It's just, it was a very general, so broad terms. I don't know, I'm just thinking outside the box, right here, a little bit. Maybe too outside the box.

MR. MORTON: There is a definition of design function in NEI 96-07 and it's not specific to a safety related device. It could be for non-stipulated systems, too?

MR. BEAULIEU: Correct.

MR. MORTON: And you're evaluated against that in terms of the screening and the evaluation. The RIS supplement, and you were talking about, categorizing systems.

So we although we talked protection systems protection systems not necessarily being the focus of the RIS Supplement, it's intended for everything beneath that, safety chillers, diesel support systems, feed water control mods, integrated non-safety related distributive control systems.

It's intended to cover all of those other systems in terms of providing the technical rigor, documentation rigor, and the qualitative assessment itself.

Whether you're looking a design features, operating history, and the quality design process to

make an engineering judgment of the likelihood of software common cause failure is sufficiently low that I can answer criterion two, no. And I can answer criterion six, no. But that's just for those non-protection systems, generally speaking.

So it allows us to address common cause software failure without having to go into BTP 7-19.

CHAIRMAN BROWN: Okay.

MR. MCKENNA: I'll read you the exact words out of 96-07, maybe that ought to help. Design functions are FSAR describe design basis functions and other SSC function described in the FSAR that support or impact design basis functions.

CHAIRMAN BROWN: Design basis functions. Okay. Well that's, that's pretty specific. Okay. That's, I take a design basis is fundamentally if the life in basis function. If I'd, you can almost use those interchangeably? A design basis function is that within the licensing basis under that title also?

MR. MCKENNA: Yes.

MR. BEAULIEU: That's the definition for design basis function too?

CHAIRMAN BROWN: Okay.

MR. MCKENNA: That's the argument --

CHAIRMAN BROWN: What?

MR. MCKENNA: -- NEI's going to present that if you -- several layers down under the definition of design function, they narrow it down to the, where it, you get this one, one leg of that, that says accident analysis.

And they're going to say, well, that's, that's, that's where it's accident, that's where we limit it to accident analysis. And we just don't' agree with that.

MR. MCKENNA: I'll just read the definition. Design basis functions are functions performed by SSCs that are required by or otherwise necessary to comply with regulations, license conditions, orders, or technical specifications, or credit in the licensee safety analysis to meet NRC requirements. So I think that answers that questions.

CHAIRMAN BROWN: That's in 96 -- that's in 50.59, that's in --

MR. MCKENNA: That's in 96-07 base, 50.59 guidance.

CHAIRMAN BROWN: Okay. All right. We'll have to -- I'm sorry. Go ahead.

MR. MCKENNA: Okay. So we're going to move on now to the development of the Reg Guide. And this will talk about each individual clarification we

made or exception. And I think we've had a lot of it all ready.

So Revision 2 to the Reg Guide will endorse Appendix D with exceptions. It will soon be issued for public comment, most likely the end of April.

CHAIRMAN BROWN: For how long? 30 days?

MR. MCKENNA: 60 days.

CHAIRMAN BROWN: 60 days.

MR. MCKENNA: 60 days. And the first exception that we'll discuss is Appendix D states that the NRC, or sorry. The NRC staff considers Appendix D to be applicable to only digital modifications, not applicable to the whole 50.59 process. Just a clarification. The second clarification --

MEMBER BLEY: I'm just curious about why in the first section of Section C, you say, Appendix C and Appendix D are generally acceptable as a means of complying with the requirements of 50.59.

MR. MCKENNA: So you're looking at an older version of the --

MEMBER BLEY: I am.

MR. MCKENNA: -- Reg Guide.

MEMBER BLEY: That's simple.

MR. MCKENNA: So Appendix C, Appendix C is no longer discussed.

CHAIRMAN BROWN: What was that? Say that again.

MEMBER BLEY: We don't have the current version.

MR. MCKENNA: Yes. So, so you required that 30 days in advance. And we were still going through the mods.

MEMBER BLEY: Well if, if it only speaks to Appendix D, then why given what you have up here, which is in the previous section that Appendix D is applicable to digital modifications only, and not generally applicable to 50.59. Over here it says, acceptable as a means of a combined with requirements with 50.59. Maybe you want to --

MR. MCKENNA: That, that wording has changed substantially.

MR. MCKENNA: Okay. I got that --

CHAIRMAN BROWN: I totally lost the bubble.

MR. WATERS: I think that sense is -- don't, please, I was just trying to talk, you. I think that sense is, we didn't want to - this is highly focused on digital technologies, how to address it in 50.59. We didn't want to inadvertently set precedence for some other type of modification outside

of that.

MEMBER BLEY: Well the first statement makes that very clear.

MR. WATERS: Right.

MEMBER BLEY: The second one kind of nullifies it.

MR. WATERS: It says --

MEMBER BLEY: If you changed the line, maybe --

MR. MCKENNA: But that word, again, that wording has changed substantially.

MEMBER BLEY: Okay.

CHAIRMAN BROWN: Where, where are you? Where did you read that Dennis?

MEMBER BLEY: I've got a draft version.

CHAIRMAN BROWN: Are you talking at 1 --

MR. MCKENNA: C1.

CHAIRMAN BROWN: C1.

MR. MCKENNA: Heading, not A.

CHAIRMAN BROWN: C1. Blah, blah, blah. Generally acceptable --

MR. MCKENNA: So --

CHAIRMAN BROWN: Which version are you reading? The NRC staff considers the guidance --

MEMBER BLEY: The one you sent me,

Charles.

CHAIRMAN BROWN: I can't read the header on it. It got wiped out. Oh, April of 2019.

MR. MCKENNA: That header is always been there in the development because that's when we've thought that it would be published for public comment.

CHAIRMAN BROWN: And serves the guidance of Rev. 1, Appendix C and D, generally acceptable. Is that what you're talking about?

MEMBER BLEY: That's what I've been talking about, but that's what he said has changed now.

CHAIRMAN BROWN: What's changed?

MR. MORTON: The reference to -- oh, sorry.

MR. MCKENNA: So that whole paragraph has been --

CHAIRMAN BROWN: The lead in paragraph before you hit A --.

MR. MCKENNA: That's correct.

CHAIRMAN BROWN: It's 1A, 1A is --

MR. MCKENNA: And it is currently under revision in OGC to get better legal words. So I can't even tell you --

CHAIRMAN BROWN: Okay.

MR. MCKENNA: -- the exact wording right now.

CHAIRMAN BROWN: Okay. That's, that's fine. Okay. Thank you.

MR. MCKENNA: Yes.

CHAIRMAN BROWN: I just wanted to make sure I understood what you were talking about.

MR. MCKENNA: The next clarification is on Human System Interface, which we, we've already discussed previously in that I think we discussed this whole slide, actually. I'll just keep it up there in case there's any more questions.

CHAIRMAN BROWN: You -- yes, I just had a question on that. You, you're commenting that you agree in doing this, but yet, when in Section 2C you hedged it saying, it may or may not be appropriate to be used.

MR. MCKENNA: Section 2C.

CHAIRMAN BROWN: Of the, of your comments.

MR. MCKENNA: C2?

CHAIRMAN BROWN: Yes. There was -- I'm trying to find where the explicit --

MR. MCKENNA: This is the one I brought.

CHAIRMAN BROWN: The NRC, yes. The NRC staff position, this note, there's a note. Oh, that's

on the radiation letters.

MR. MCKENNA: Yes. We're, we're not hedging this one at all. We're acknowledging is that there's more guidance in screening for Human System Interface in Appendix D than there is in the base document of 96-07.

MEMBER BLEY: Norbert pointed, Norbert pointed out earlier that that in the basis document, it doesn't ignore it. It just mentions it and says you need to do it.

MR. MCKENNA: There, there should be hedging on it.

CHAIRMAN BROWN: I've got too many documents open. If I go back and find that, I'll come back and ask a question again.

MR. MCKENNA: Okay. Again, we're not taking exception to it. We're just clarifying.

CHAIRMAN BROWN: It would, the way I read this, it said that the Section 2C, C2B in the Reg. Guide.

MEMBER BLEY: Do you want to read? I've got it here, Charlie, if you want to read.

CHAIRMAN BROWN: The Human System Interface et cetera, et cetera is -- in other words, that digital interfaces are different, and may not be

appropriate. That's, I took out of that section. It said that, that -- are you all taking that out also? Or are going to retain that information?

MR. CARTE: No. I think that that's a slight Norbert Carte, NRC. I think the point is that direct comparison between analog and digital may not be appropriate on -- if you compare them on such criteria as number of steps.

Because the steps you perform on a digital display may be much easier and quicker to perform than the steps you would perform using other forms of controls. Go ahead.

You can't compare them directly on abstract characteristics. And that's why we wanted a human factors professionalist involved in the assessment of whether it's adverse.

CHAIRMAN BROWN: Well in Appendix D there was an example where it talked about using a touch, touch screen for controlling an operation where you then had to, it was like four steps.

Instead of turning a switch and the thing started, you had to go through four steps. You had to select, you had to select a screen. You had to then find the, some, some other screen. Then you had to find a third screen. Then you actuate it, which if

you've got a critical component, that's absolutely stupid.

You ought to have a switch to turn it. If you don't care how long it takes you to find the information or to do it, then that's okay. So that seemed to be a disconnect in my own edits. There's an input --

To me, you've got to be very, very careful with touch screens, fact is that, I just, in my experience, from our plants that we first did this. We only used it for recording and doing and checking calibration data, or other type data in logs.

And any part that, any pump, any valve, anything that had to be operated, you did it with a switch just because we didn't want an operator taking 30 seconds to do something, or a minute as he was scrolling through a menu, or scrolling through a list of options.

So I, I take it you all are not disagreeing necessarily with that. It's just that you're saying that you have to have a separate HSI evaluation of each and every circumstance? Is that what I hear you saying?

MR. CARTE: We want to have an explicit HSI professional involved in the basic determination

of whether it's adverse or not. Not necessarily that, that the screener being an HSI, but there needs to be an HSI evaluation that this is not adverse.

Because it, it's more complicated than just the number of steps or things like that. So it's, it's a, something we felt was, was not appropriate for any 50.59 trained engineer to do. But properly appropriate for an HFE professional to make.

CHAIRMAN BROWN: But does that drive you into the LAR world? Or is that still within the licensee's ability to make that determination on his own?

MR. CARTE: If they decide it's not adverse, then evaluation and no LAR. If they decide it is adverse, then they go into a full evaluation, and possibly LAR.

CHAIRMAN BROWN: Yes. But you're going to leave that at, you're going to leave that decision in terms of the -- how, how components are actuated explicitly, you'll leave that up to the licensee to make that determination?

And whether it turns out you eventually have to do something else as it comes up later? You've made that decision in terms of your flexibility assessments?

MR. CARTE: Yes.

CHAIRMAN BROWN: Okay. I just wanted a explicit --

MR. CARTE: It's in the screening section.

CHAIRMAN BROWN: Okay. Fine.

MEMBER SKILLMAN: Back on Slide 32, please. Thank you. The Life Sentence, the staff agrees that HSI maybe screened. Is the verb, screened, in your definitions? Is there any ambiguity about what that means?

MR. MCKENNA: So, so this slide is not the language that is in the Reg. Guide.

MEMBER SKILLMAN: Right.

MR. BEAULIEU: No. The screen is, is the term used in 96-07.

MEMBER SKILLMAN: It is?

MR. BEAULIEU: So there is no ambiguity with respect to that term.

MEMBER SKILLMAN: Thank you, David. Because --

MR. MCKENNA: I'm sorry I didn't answer your question. I put your example.

MEMBER SKILLMAN: Thank you.

MEMBER BLEY: Appendix D has a whole section on this.

MR. MORTON: Yes.

MR. MCKENNA: Okay. To the next clarification, this is discussed in Appendix D, but we wanted to emphasis that the examples in Appendix D are meant to illustrate guidance and not derive. You can't derive guidance from the examples.

MEMBER BLEY: I'll tell you what, it makes sense and after you explained with respect to one example it makes sense. It's pretty cryptic to somebody who wasn't involved in the history getting to that point. You know, you might think of clarifying the language a little, what you mean.

MR. MCKENNA: Yes, I -- those, these exact words do not exist anymore, so. OGC has provided or is providing some better language.

CHAIRMAN BROWN: I hope that helps. Is that, in the Reg. Guide, is that C? C.G., C.G.?

MR. MCKENNA: Now --

CHAIRMAN BROWN: You talk about examples, 14 through 23.

MR. MCKENNA: Right. Yes.

CHAIRMAN BROWN: In the Reg. Guide.

MEMBER BLEY: I'm sorry. Oh, examples, you got the numbers wrong.

CHAIRMAN BROWN: I went from item E, there

was no F, and there was a G. So I didn't know what was in between. So I guess one of my questions there was C deal with, or E dealt with overall perspective. This is a paragraph in Appendix D.

And then at some point, you transition to the determination on -- your position on determination of safety analysis result impact. I thought that might have been F, but there was no F by it. That's on Page 10. Actually that's PDF Page 10. I think --

MEMBER BLEY: Just a short cut, I think we'll be real interested in seeing how you've revised this section.

MR. MORTON: Yes, because it's been modified.

MEMBER BLEY: For me is was pretty cryptic, those whole list of things under 2, C2.

MEMBER REMPE: Is there a date when you expect the revised version from OCG, do you think? I'm sorry --

MR. MCKENNA: Yes, so when we issue this for public comment, at the end of April, we'll have all the current OGC comments incorporated into the Reg. Guide.

MEMBER REMPE: So typically, our meetings always want 30 days advance notice, but you're going

to give us an information briefing in the 1st of May. And so it might eliminate --

MR. MCKENNA: So as soon as --

MEMBER REMPE: -- some in the summary of the discussion if we could see the revised version.

MR. MCKENNA: Right. Soon as we have the revised version that will go out for public comment, I will hand that ACRs.

CHAIRMAN BROWN: Yes, that's in our first meeting in May?

MR. MCKENNA: May 2nd.

CHAIRMAN BROWN: For the full committee is May 2nd? Yes. Okay. If you could --

MEMBER BLEY: That's only a couple of weeks of away. We're not likely to see this before.

MEMBER REMPE: Well I think we should.

CHAIRMAN BROWN: If you've issued it, then we should be able to see it.

MEMBER BLEY: Well, right, or they can bring it with them.

CHAIRMAN BROWN: No. We're not going to write a letter. But I mean, they, they could at least use that in their briefing as opposed to this version.

MEMBER REMPE: And if we had time to read it, it might eliminate a lot of questions if the text

is changed.

CHAIRMAN BROWN: But we'll have a sub -- after public comment, we'll have another meeting --

MEMBER REMPE: Right.

CHAIRMAN BROWN: -- to go through what all the resolutions are. I presume that would nice. And then we'll end writing a letter. Is that shaking your head up and down? Or not shaking your head up and down?

MR. MCKENNA: Keeping my head straight.

MEMBER BLEY: Maybe they'll go away.

CHAIRMAN BROWN: Oh, we won't go away.

MR. MCKENNA: Okay. The next section, so we're just clarifying again that the RIS Supplement 1 is the technical basis for digital modifications, and it's a clarification, not an exception. Okay.

Then we get into the part where we've been discussing on Section 4.3.6. And again, we've discussed this previously in that Appendix D is written such that the determination of the impact is done against the safety analysis.

Whereas our position is the result of any malfunction previously evaluated in the SR must be compared.

MEMBER RICCARDELLA: So the operative

words are what's in parenthesis there? I just want to --

MR. MCKENNA: Yes.

CHAIRMAN BROWN: So that is yet to be resolved due to your public comment, again?

MR. MCKENNA: Right, right. It has not received public comments.

CHAIRMAN BROWN: Yes. Okay. So --

MR. MCKENNA: We've resolved it as far --

CHAIRMAN BROWN: You're concerned.

MR. MCKENNA: Yes. That's correct.

CHAIRMAN BROWN: So unless somebody really comes up with something good, it's irrefutable? This is your all's position, right now, relative to that disagreement?

MR. MCKENNA: That's correct.

CHAIRMAN BROWN: With NEI? Okay.

MR. MCKENNA: And then the last, I believe it's the last one. Yes. Examples -- the examples in Section 4.3.6, so they all carry through the guidance written in 4.3.6 in Appendix D. So all those examples used that -- use that guidance.

CHAIRMAN BROWN: They used the RIS guidance --

MR. MCKENNA: No. They used the Appendix

D guidance. So the this Appendix D where you're evaluating against the safety analysis and not using that malfunction of the SSC.

CHAIRMAN BROWN: Yes. So that would have -- if your logic wins, or is retained, then those would have to be rephrased, or reworked?

MR. MCKENNA: Well, Appendix C, is what it is. We're going to issue the Reg. Guide and it would say words to this effect, that you can't follow the guidance --

CHAIRMAN BROWN: All right. So don't have to revise it.

MR. MCKENNA: No.

CHAIRMAN BROWN: It would just your all's -- so they would just have to -- whoever's doing the analysis or the evaluations would have to do it with respect to your position --

MR. MCKENNA: That's right.

CHAIRMAN BROWN: -- relative to what's in Appendix C. Okay. I got that. Okay. Thank you.

MR. MCKENNA: Okay. So we've stopped there on discussing the Reg. Guide and I'm going to move in to discussing the RIS, which actually may go fairly quickly.

MR. MORTON: Because we've covered a lot

of it.

MR. MCKENNA: Because we've covered a lot of it already.

MR. MORTON: Yes.

MR. MCKENNA: So again, the qualitative assessment of the RIS was originally discussed in NEI 101-01. but there was limited discussion we had to accomplish a qualitative assessment.

The RIS Supplement 1 is very good guidance on his to do a qualitative assessment, which I'll get into in the next slides. In order to support a conclusion, that you have a low likelihood of failure and you can now evaluate those sections, those criterion of 50.59 in the evaluation section.

So the first input into the qualitative assessment is to design attributes. What is built into the modification, as far as, false detection, failure management schemes, internal redundancy, diagnostics. And you can have external items in the modification, as far as mechanical stops or limiters.

MR. MORTON: Anybody want some?

MR. MCKENNA: Sure.

MR. MORTON: Actually, no.

MR. MORTON: So just as another nuance, within the details of the qualitative assessment, when

we looked at the three qualitative factors, design attributes, the quality of the design process, and the operating history.

This particular slide is where we leveraged the post credit for our expectations for qualitative assessment, DI specific. Deterministic features within the design, within the digitalized architecture to address the specific hazard that you have identified within the particular mod.

And we still began a few examples of some testing features, internal redundancies, even diversity if you want add that, within the channel itself. What specific ways are you addressing direct hazards with in the systems.

How are you addressing them? What factors and to do that? So the documentation, as well. So -- we leveraged the most credit. Here, within the three. So I just wanted to comment, make sure we're clear on that particular piece.

MR. MCKENNA: This slide is just lists some more design attributes that were not included in the previous slide.

CHAIRMAN BROWN: Can you go backwards? Typically, we obviously look at Watchdog timers and unit directional, direct communications, relative to

protection and safe guide systems. That's what we've had most discussions on.

The universal, unidirectional communications can apply from a control of access standpoint because the network is used to consolidate all information going from into a plant before it has been sent from made successful to a main controlled room, or other technical support facility, or something like that.

So that becomes a critical point if you're going to external, if you're going to access or external to the overall plant, to the internet, in other words.

I presume that's, so that's it's not just applied to protection systems and safe guard systems. That's a more universal -- Watch Dog Timers, are fundamentally saying, hey did the processors stop or not? And does it matter?

In safeguards, it does. In the protection systems it does. But for, for other parts it may not. Although it might be useful for other reasons because if you just have it reset, you don't even have to shut down, it resets them.

I don't know, the processor, the, the platforms that they've been using, some of them take

five or six minutes to reboot, which really kind of nasty.

MR. MORTON: Yes. This is not an all-inclusive list of futures --

CHAIRMAN BROWN: Yes. I understand, I just want to --

MR. MORTON: And each one of these gives you --

CHAIRMAN BROWN: -- it's just to --

MR. MORTON: -- a different benefit.

CHAIRMAN BROWN: -- it's quite a shopping list is the point.

MR. MORTON: Yes. We've leverage -- this list is based upon a lot of staff's own engineering judgment and knowledge. And also, with the lifesaving reviews you've done both in advanced reactors and operating reactors, and the different design features we've seen licensees and applicants apply to adjust to some hazards.

One in particular, segmentation, which keeps you a lot of bang for your buck in terms of giving you a level of diversity in terms of signal and process diversity, things of that nature. Mentioning redundant, ring that rec, sir, connect with switches, traffic control to try to prevent things such as

thunderstorms --

CHAIRMAN BROWN: I got it.

MR. MCKENNA: So we tried to give a plethora of options so that people got the gist of it. You don't have to just depend all the timers freezing.

CHAIRMAN BROWN: Okay. Thanks.

MR. MCKENNA: The next step in qualitative assessment is the quality of the design process. How the software was developed? The system designed? The validation and the testing processes. And for safety related modifications, the, the documentation is available for referencing. And obviously for commercial grade, the amputation may be not extensive as a safety designed modification.

MEMBER SKILLMAN: Would a, would a proposed modification to a nuclear safety grade system necessarily come from a program that is under regulated QA program, Appendix B to 10 CFAR 5, 50.

MR. MCKENNA: Well you answer that.

MR. MORTON: You're asking if, if you're doing a modification with safety grade system, would you be?

MEMBER SKILLMAN: Yes, yes.

MR. MORTON: It should have if it's meetings it's requirements under Appendix B program.

MEMBER SKILLMAN: Now if you --

MR. MORTON: Well if, if it's rate degraded. That's a different aspect to it, as well. But it really depends on the SSC you're modifying.

We put that last bullet in there, for examples, because of a lot feedback that we received from industry saying, hey, NRC, if you're doing modifications to these non-safety related systems, they're not Appendix B systems.

They don't necessarily have the quality attached to them that safety related systems do. We recognize that fact. So, as part They qualitative assessment, we tried to bridge the gap between some levels of demonstration of quality, building, construction.

But necessarily having to be something that a part of Appendix B, Reg. Guide endorsed standards. So we said, you know, in the street consensus standards, something to that extent for non-safety related.

And for safety related, you are under auspices of your Appendix B, quality assurance program per the documentation, you have to meet, provider standards that you have provide, as part of the design.

CHAIRMAN BROWN: Okay. Thank you. Go ahead, I was just bemusing with Peter.

MR. MCKENNA: So that finishes the discussion of the RIS. We're now going to go into what started and planned modifications are started and planned using the RIS in the industry. This is a list provided NEI.

Just to give some examples of what is out there. I think I have two slides on this. These are the final two slides. So currently there is three safety related digital mods, start in 2018. You can read the list. These are generator controls, breakers, circuit controls.

Same type of modifications. Plan to start in 2019 with various completion times. I'll keep that list up there without reading everything. And I can go back and forth here. And then the last, you can see, the types of modifications also.

CHAIRMAN BROWN: So are these planned safety related mods? Are those LARs or are those ones being made the 50.59 and don't require LARs?

MR. MCKENNA: So obviously, the industry plans to use the 50.59 process on these, but we don't know the outcome.

CHAIRMAN BROWN: Okay. So that's, that's,

this is the plan in other words. Yes. Then we go -- so they will go through the process and you'll have a determination made.

MR. MCKENNA: That is correct.

CHAIRMAN BROWN: But they've identified what they're looking at?

MR. MCKENNA: Right. But there are most likely ones that they're going to do a qualitative assessment on. And that qualitative assessment could see the final outcome of that would be low likelihood of failure.

CHAIRMAN BROWN: On an assessment? On a screening basis or --

MR. MCKENNA: Qualitative assessments done on the evaluation.

CHAIRMAN BROWN: Evaluation. Okay. Okay. Next slide? Backup slide.

MR. MCKENNA: So we're done. Our briefing material.

CHAIRMAN BROWN: All right. We've got NEI still to come. I don't think we will finish that this in, there might be some discussion there. My suggestion is that we break for lunch, and then have NEI come in after lunch. And so we'll come back.

Well before we leave, before we recess,

before we recess, are there any, anybody else have any questions here around the table? I hear none. So we will recess until 1:00 p.m. when we will restart. And then NEI will come up to the table. Okay. Thank you.

(Whereupon, the above-entitled matter went off the record at 11:44 a.m. and resumed at 1:02 p.m.)

CHAIRMAN BROWN: Okay. The meeting will come back to order, and we'll proceed with NEI and associates, LeBlond & Associates to give us our NEI industry perspective on the Appendix D. So, who's going to open?

MR. GEIER: Yes, I'll open. I'm Steve Grier. I'm with NEI and my current position is Senior Director of Engineering and Risk. And I'll give just a real brief, a little bit of background on myself. I've been with NEI about three and a half years. Before that I worked 30 years at two different nuclear stations, primarily in design engineering positions.

I did want to just provide just a few opening remarks before I pass it off to my much more qualified colleagues to talk on this issue. And basically, I did want to say -- I do want to express appreciation to ACRS to having industry come in and talk and provide some of our prospectives.

You know, we are -- did want to say, you

know, we're very much aligned on being able to move forward with upgrades for digital. And primarily to do some needed replacements of obsolete and some challenges with reliability at our stations. We strongly feel that digital upgrades can provide improvements to plant safety and also, to the station and system reliability.

And, you know, as was talked about during the NRC portion there is an appetite for stations to move forward and begin moving forward with their digital upgrades. We got, we know there are several fleets -- and Neil will talk a little bit about what Duke Energy is doing -- and several other fleets that are moving forward with smaller mods with but are also looking for some of the major mods including SFAS and RPS.

The good news is the RIS 2002-22, Supplement 1 and the ISG 6 are really important documents for the station. The risk is really spurring some sub-lumen, some of the smaller less safety significant mods. And then ISG 6, I think once we get a little bit experience and people do some planning we'll help some stations move forward with some of the major again, our SFAS and RPS.

The Appendix D is really, we look at this

as the third leg, regulatory leg, out of the -- that's coming out the independent or integrated action plan. It's really a critical piece to provide the guidance to the industry to give them the confidence to move forward with 50.59 for digital.

You know, the staff talked about is the Appendix D has been more than three years in the making. And we've had over 30 public -- around 30 public interactions to try to get a line around it. I think the staff and the industry is largely aligned on the guidance.

MEMBER BLEY: Steve, can I interrupt you?

MR. GEIER: Sure.

MEMBER BLEY: Because I didn't see it in the rest of your slides. We heard this morning that you did Appendix D but you had a parallel effort to extract the technical details and you were going to publish that later. Now are you guys reasonably content with the RIS? Or are you planning to get that other document out soon?

MR. GEIER: Right. So the -- back in the 2017 range, we were putting out a document that was called NEI 16-16.

MEMBER BLEY: Okay.

MR. GEIER: And it was primarily to

address the software, CCF.

MEMBER BLEY: Okay.

MR. GEIER: And so, it was a lot of time and effort, a lot of public interaction on that. And when we decided to move forward with the RIS, we put that on hold. So now that the RIS is out and we've got the ISG, we're reassessing what we need to do. And there's some changes. We can talk a little bit more specifics but, so there's changes in the guidance stack that the industry is looking to use.

And primarily these are coming out of EPRI. EPRI is developing several new products to help with, you know, what we've talked about is a real solid quality design process. So they have a design engineering guide that's been issued last year. They're also coming up with some new documents related to addressing hazards associated with digital mods that will include CCF but also will address other potential hazards such as EMI, RFI, cybersecurity, human factors. So that's kind of a new population of information.

So we're going to reassess that NEI 16-16, which we are, and we're going to develop a different document that's going to leverage the EPRI products that are coming out.

MEMBER BLEY: Okay. So you'll make use of those?

MR. GEIER: Yes. And we're looking at mid to late summer to having the draft of that out.

MEMBER BLEY: Of this year?

MR. GEIER: Of this year.

MEMBER BLEY: Okay. EFPI has that second document done?

MR. GEIER: Yes. So they've issued their design engineering guide.

MEMBER BLEY: Right.

MR. GEIER: They've issued what they call a HAZCAD document which is their Hazardous Analysis. And their final document, that's going to come out, is specifically to address CCF, it's called a DRAM.

MR. ARCHAMBO: And it's a --

MR. GEIER: Neil, can probably talk to the actual acronyms of that.

MR. ARCHAMBO: Yes, it's Digital Reliability Analysis Methodology, that's what DRAM stands for --

MEMBER BLEY: Okay.

MR. ARCHAMBO: -- if you hear that term.

MEMBER BLEY: Okay.

MR. GEIER: Back in 2017, EPRI had

published a document that we called the CCF Guide. It was --

MEMBER BLEY: I sort of --

MR. GEIER: -- Dependability and Reliability of Digital Systems, a long name.

CHAIRMAN BROWN: I think we looked at that anyway --

PARTICIPANT: Which one?

CHAIRMAN BROWN: The operating.

PARTICIPANT: I don't remember that.

MR. GEIER: And that actually formed the basis for this NEI 16-16. We abstracted some of the detail out of that. They're revising that with this DRAM document. And so, we need to find the best way to leverage that information.

MEMBER BLEY: Thank you.

MR. GEIER: Okay, next. So what I wanted just talk briefly about Appendix D before I turned it over to, Neil and Peter, is what we're looking for is a clean endorsement. And quite honestly, anything other than a clean endorsement of this would really cause confusion and cause it to be problematic for the industry.

MEMBER BLEY: I'm sorry to interrupt, but endorsement of Appendix D -- are you saying without

the RIS or with the RIS?

MR. GEIER: Well, the RIS is already --

MEMBER BLEY: That makes it not quite clean because it's adding the RIS to it.

MR. GEIER: So the Appendix D provides a detailed guidance --

MEMBER BLEY: Right.

MR. GEIER: -- to licensee staff for how to do 50.59s while taking -- while leveraging the RIS and the assessment that's allowed by the RIS.

MEMBER BLEY: Okay.

MR. GEIER: So it's supplemental. It's -- they actually took these --

MEMBER BLEY: So you would see that as a clean endorsement --

MR. GEIER: Yes, sir.

MEMBER BLEY: -- Appendix D with the RIS?

MR. GEIER: That's right.

MEMBER BLEY: That's what I was hoping, you meant. Okay.

MR. GEIER: With the RIS, exactly. Yeah, not standalone that's for sure.

CHAIRMAN BROWN: But without this other controversy?

MR. GEIER: Without the other controversy.

And that's -- and we put this together. That's really what our slides are going to be about, is --

CHAIRMAN BROWN: To kind of gather --

MR. GEIER: -- kind of our perspective on the controversy, where we feel we need to go. And so, you know, I think -- the only thing I really wanted to say before I moved on is that I think that if we don't endorse it with the Section 4.3.6 the way it's written really we'll comprise the benefit of the document.

And a lot of the feedback we're getting is that a lot of station's then will not move forward with their digital mods because it'll take a lot of the benefit out of the 50.59 process. So I'm going to turn it over next to Neil to talk about -- oh, go ahead.

CHAIRMAN BROWN: You just -- I got a little confused you said moving forward we'll take something -- what out of the design -- if what, takes something out of the design process?

MR. GEIER: If --

CHAIRMAN BROWN: It won't move forward?

MR. GEIER: Right. If we don't move forward with the document, as written, meaning the Section 4.3.6, the way it's written, and the exception is taken, then that's going to take a lot of the

benefit. And a lot of the mods that could be done --

CHAIRMAN BROWN: On Appendix D?

MR. GEIER: -- under 50.59 will now not be able to move forward that way. It'll likely require a LAR. And the feedback we have, and I know from my personal experience working at stations, is that if a modification requires a LAR, that removes a lot of that from approval from the station's approval process.

CHAIRMAN BROWN: So you're saying if the issue is not resolved with the words you want about the safety analysis versus the --

MR. GEIER: Component.

CHAIRMAN BROWN: -- component thrust, it will decimate the ability to make back fits?

MR. GEIER: That's correct.

CHAIRMAN BROWN: Using 50.59?

MEMBER SKILLMAN: I'd like to understand that because I've been in the position that you have been in for years, both as director of Design Engineering and multiple tours of Planned Engineering. And in the Design Engineering role, under 50.59, there was no question that the assessment was at the component level.

And when I think of the modifications for

control systems, while it was complex, it was doable to do the SSC evaluation and also the overall system behavior evaluation. They're not mutually exclusive. So I would like to understand the basis of what you're saying.

MR. GEIER: And we're going to get to that. And I'm --

MEMBER SKILLMAN: I hope so.

MR. GEIER: Yes.

MEMBER SKILLMAN: Because it kind of sounds like --

MR. GEIER: That's exactly --

MEMBER SKILLMAN: -- blackmail --

MR. GEIER: That's really why we're here just to talk about that.

MEMBER SKILLMAN: It sounds like blackmail. I know it's not, but that's what it sounds like. But I know, for a fact, that you can do both. It takes more effort. But you end up with a more thorough assessment of both, what the SSC behavior is on what would be the outcome of the, if you will, of the system behavior and the, if you will, the applicability of the accredited devices for the license.

MR. GEIER: Right.

MR. ARCHAMBO: Yes. I think it'd become clear as we go through this where the issues are.

MEMBER SKILLMAN: Please.

MR. ARCHAMBO: Okay.

MR. GEIER: Okay.

MR. ARCHAMBO: If you're ready -- okay.

MR. GEIER: So next I'll turn it over to, Neil from Duke.

MR. ARCHAMBO: Neil Archambo with Duke Energy. I appreciate the opportunity to be here. I've been in the industry about 32 years, over 32 years, hard to believe -- hard to believe for me. I'm a design engineer, spent most of my time as a design engineer, and I write 50.59s. In fact, I just finished writing one a few weeks ago. So this stuff is near and dear to my heart.

I understand the issues and on top of that, I get the opportunity to the review every single 50.59 screen and evaluation at Duke that's done on a digital modification.

We have six plants, 11 units so, that's a lot of readings. So, I get to see a lot of the things that have caused us issues when trying to apply 50.59 and digital changes. And once in a while, I get one from the industry to look at, so I have a pretty good

idea where the issues are at.

So I'm going to run through just a few of them quickly and then we'll get on to the meat of this discussion. And explain --

MR. GEIER: Can I go to my next slide then?

MR. ARCHAMBO: and -- yes, just go on to the next slide, please.

MR. ARCHAMBO: And explain what Appendix D does for us. How it resolves that issue now. We've had problems. We've had difficulties as licensees identifying FSARs described as iron functions as they apply to digital modifications. And, you know, why is that? Why is that so much different? Well, they're a lot more complicated.

We put in digital modifications now. We're combining functions. We're maybe networking things, putting them on a platform. It's not always easy to understand exactly what you're affecting. That's been an issue in the industry. And Appendix D helps us walk us through that -- how to identify those design functions that were otherwise -- little bit difficult to understand.

It helps us to determine if a change is adverse or not adverse in the screening process. Now

we have people. We have folks out there that are improperly screening things out when they should screen them in. And we have people screening things in when they probably should've been screened out or could have been screened out.

So there's licensees out there that just thrown their hands in the air and say, I don't know. I don't know if I should screen or I'm just screening everything in. From the smallest change, I'll screen it in, when clearly it could have been screened out, they're just screening everything in.

So Appendix D helps us walk through that. It gives us the guidance that we think we need to determine, in a reliable fashion, whether something screens in or screens out in a digital modification.

Next one is how do we address CCF in a 50.59 evaluation. How do we address it? You got Questions 1, 2, 5 and 6 that we've talked about, that really are the critical ones, the digital modifications. Where do you address CCF? You know, it's not necessarily in Criterion 1 or Criterion 2, that's about reliability. It's more 5 and 6 when we're talking about actions to different type, malfunction with a different result. But folks are confused I want to address Common Cause Failure.

MR. RICCARDELLA: Excuse me. What's that acronym mean? Is it ECF?

MR. ARCHAMBO: I'm sorry, CCF, Common Cause Failure.

MR. RICCARDELLA: CCF.

MR. ARCHAMBO: And predominantly software Common Cause Failure, wherein the process do we identify and address software Common Cause Failure or, any digital Common Cause Failure. And we believe Appendix D addresses that issue. Gives us an idea where we're supposed to address those within the 50.59 process. Next slide, please.

One thing I want to, maybe before we go to the next slide, is it's hopefully, abundantly clear in Appendix D. There's a couple boxes with caution statements that says, this is supplemental guidance. You've got to use NEI 96-07 Revision 1 in conjunction with Appendix D. We don't want licensees stripping out just Appendix D and walking away with it when they do their digital modifications.

So we try to make that abundantly clear that you still have to use the main body, the main guidance in order to successfully go navigate through the process.

MEMBER BLEY: And that was real clear. In

fact, sometimes, I'm -- why is he saying that, that seems obvious.

MR. ARCHAMBO: That's why. There's a lot of information in the mother document that we don't want to lose. You know, we just didn't want to re-write everything out of the main document make it an unmanageable appendix. So next slide, please.

So I just talked about addressing Criteria 1, 2, 4 and 6. Now 1 -- Question 1, we're talking about accidents, right, accident frequency. In Question 2, it's likelihood of malfunctions. We talked about frequency and likelihood a little bit. That's a reliability issue. Questions 5 and 6, accidents of different type, malfunction with a different result. People have difficulty in digital modifications addressing those particular questions, those criteria.

So we believe Appendix D provides that guidance that they need for digital-based activities with examples to how you apply the guidance.

MEMBER SKILLMAN: Neil is the difficulty they're not understanding how the plant behaves based on the body of documentation that they have?

MR. ARCHAMBO: Some of it is, yes. And we'll talk about that in just a few seconds. What I

see, when I review a lot of these documents, as people be addressing Common Cause Failure in Criterion 1. Criterion 2, well, that's really not the place to address it. That's where you address the reliability.

Have I increased the likelihood of a malfunction, well, that's a reliability issue. It's nothing to do with Common Cause Failure, until you get to Criterion 5 and 6. That's where Common Cause Failure comes in. So we see that over and over that people are addressing the wrong things in the wrong places.

MEMBER SKILLMAN: Well, let me ask my question a different way. Is this because the station does not have an accurate design basis document? Or is it because the station doesn't have an accurate final safety evaluation report?

MR. ARCHAMBO: Well, I wouldn't say they're not accurate. I mean they've all, of course, been licensed to those particular documents.

MEMBER SKILLMAN: Are they not thorough?

MR. ARCHAMBO: That comes to that Criterion 6 and the question is -- or the comment is we have varying degrees of detail in FSARs. You know we have six plants, 11 units within our fleet. We have some older ones that have very little detail,

very little descriptive material and our newer plants have all kinds of detail and descriptive material.

MEMBER SKILLMAN: It could be twice as much?

MR. ARCHAMBO: Yeah, it could be twice as much. It could be three times as much. So what we run into is applying -- this is where Criterion 6 really comes in. This is the meat of Criterion 6, is you're going to have uneven application of 50.59 on plants that have older FSARs versus plants that have newer FSARs because there's going to be a lot more descriptive materials in the newer FSARs.

So under the guidance, the way it's interpreted by the staff, I could probably do a modification under 50.59 in an older plant but I might have to get a license amendment request for that exact same modification in one of my newer plants simply because it has more descriptive material.

And that problem was actually solved about 20 years ago and, Pete's going to talk about that. So we're kind of drudging up a problem that's already been solved. And that's what we hope to walk you through as we go through this particular section of the presentation. Does that address your question adequately?

MEMBER SKILLMAN: I'm thinking now you've got McGuire and Catawba on one end and you've got Oconee on the other.

MR. ARCHAMBO: Robinson --

MEMBER SKILLMAN: So you have some moldy, moldy, oldies there.

MR. ARCHAMBO: Sure.

MEMBER SKILLMAN: Where the information's very sparse.

MR. ARCHAMBO: That's right.

MEMBER SKILLMAN: So I certainly appreciate that.

MR. ARCHAMBO: Yes. That causes issues. Certainly causes issues. The next item down there is recognizing, you know, the impact on our plant license basis when we combine functions. You know, a lot of our plants were built and large stuff is separate. Maybe the only reason it was separate was because we didn't have the technology to put them together. Now we can. And in some cases, we are. We're putting in distributors control systems platforms. And we're migrating systems onto those platforms where we're combining functions.

CHAIRMAN BROWN: What kind platform?

MR. ARCHAMBO: Distributors control

systems platforms.

CHAIRMAN BROWN: You say you're migrating from -- I missed that sentence, sir.

MR. ARCHAMBO: Okay.

CHAIRMAN BROWN: You had a run-on a set of words there for me.

MR. ARCHAMBO: In a number of plants, and we're included in that, we're putting in platforms, distributed control system platforms and we're migrating to balance the plant systems on to those platforms. Now when you do that, you know, you're --

CHAIRMAN BROWN: There's a lot of common software in that?

MR. ARCHAMBO: Yes. You're combining functions and it's -- so recognizing your impact on the licensing basis, when you do, that's key. That's the key issue. 96-07, the base document, doesn't necessarily address that. So we're trying to bring that out in Appendix D. Here's what you have to look for when you're combining functions in such a manner. And we hope we did that with -- through the guidance and examples.

And the last one is the main one, and we really want to spend the balance of our time talking about. That's Criterion 6, which you've heard a lot

about today. Where do we address malfunction results? Is it at the system level? Or is it at the plant level?

Now we talked briefly about the FSARs. That's one of the key components. A lot of the older plants have very little descriptive material, very little descriptive material. So applying 50.59 to some of those plants is going to give you a different result than if you apply it to one of the older plants.

So for digital activity, I just want to make it clear, that's the critical -- that has been the most difficult criterion to address, is Question 6 because that's where Common Cause Failure, software Common Cause Failure comes into play.

MEMBER BLEY: Can I pin you down a little because I think I'm understanding, but I want to make sure I'm right.

MR. ARCHAMBO: Okay.

MEMBER BLEY: And this is the difference between applying a defined process and I'm kind of thinking more generally about what one would you like. From the more general side, I would think if we have less detail, the older FSARs, then there ought to be more question of does this new thing do something

different.

But since it's written in terms of does this change something that was in the FSAR, if the FSAR didn't even talk about it, then it doesn't change it. But if it's something that wasn't considered then how could it be important? It seems like you oughtn't get out of it so easily.

On the other hand, if you've got a lot of detail in the FSAR and this changes something that's not too significant, then you're paying a price for having more information there. And I think that's what you're saying.

MR. ARCHAMBO: Right, yes.

MR. LEBLOND: Well, you can see it's a problem, right? You can see it's an issue.

MEMBER BLEY: I can smell it's a problem. I haven't actually tried to do this. But I can see it's, you know, I've done lots of other kind of analyses on old plants, new plants. And, yes, most of the time we'd have more trouble with the old plant because we had to dredge up the information that wasn't easy to find, sometimes hand over hand looking for it.

But this is a different problem. This is -- I'm working from this document and now do I have a

change or no change. And if there was nothing there -- the way it's being interpreted, I think, on both sides is you don't need to dig on it. If there is information there then the question is how much of a change is really significant enough to push this outside of the 50.59 process. Am I saying that close to right?

MR. ARCHAMBO: Yes. There is a method and again, this was actually addressed 20 years ago. Pete was in the midst of it. They thought about this. They considered this, the uneven application of 50.59. Because of different details in your FSARs, you know, it was resolved. And so there is a method to take care of that to level the playing field, right.

MR. LEBLOND: Right, and see --

MR. ARCHAMBO: So everybody has to address the same things no matter how old your FSARs is, no matter how detailed it is or, how not detail it is. What they solved 20 years ago, we're going to talk about and explain -- Pete will -- is how we level the playing field on that.

MEMBER BLEY: So the claim is --

MR. ARCHAMBO: And what we don't want --

MEMBER BLEY: -- it back then is incorporated in Appendix D?

MR. ARCHAMBO: Yes. And what we don't want to do is undo things that were done 20 years ago because that's the way it's being taught today.

MR. LEBLOND: Right.

MR. ARCHAMBO: And that's the way people have been doing 50.59 so we got to consider that, you know. So you know, stay tuned. Pete will certainly educate you on that.

MEMBER BLEY: I'll be quiet for that.

MR. ARCHAMBO: No, it's quite all right.

MR. LEBLOND: Well with that I'm just going to leave. I'm done. I just figure I got nothing to talk about.

MR. ARCHAMBO: Well, so, having said that I'm going to turn it over to Pete. I'm done unless you have any questions specifically for me.

MR. LEBLOND: Next slide, please, thank you. Hi, I'm Pete LeBlond. And I'm a member of the team. And before I go any further it would be a sin if we didn't mention Kati Austgen. I'm a very poor fill in for Kati Austgen. She's really our leader. And if she wasn't on vacation with her kids in spring break -- who'd believe that -- she'd be here. So she's been our leader and she's really the person that would be doing this most likely I suspect.

So, having said that, my name is, Pete LeBlond. I've been in the business about now 42, 43 years that sounds like an awful long time. I spent 22 years with Exelon. I was at Zion for many years. And then I quit 20 years ago. I've been on my own and doing this operability 50.59 design basis control stuff.

And I can't believe I still have to bring it up now, but I was one of a group of five or six people that helped craft 96-07. And I was involved with the negotiations that we're talking about and the kind of issues that you bring up. And we're talking about leveling the playing field. I'm going to address that right now. I hope, I hope, I hope.

So we have four points that I want to make and I'm going to have a slide for each one to expand on each one. But before I do start marching my way through these four points I want to highlight kind of a common theme. You heard Steve ask for a clean endorsement. And I'm going to say that absent a clean endorsement you run the risk of undoing the fixes to the problems that were 20 years old.

We've touched on some of them right here and I'm hopefully, going to give you some more detail. So what we've done in Appendix Delta is entirely

consistent with the rule as it was crafted 20 years ago and has been implemented since then, as I've taught at Fermi last week -- literally taught at Fermi last week.

So with that, what are the four points that I'm going to highlight? Number 1, we talked all morning using the word malfunction as if it's in Webster's. It's actually a malfunction of an SSC important to safety. One of the -- we have 24 objectives 20 years ago. And one of them was there is no definition for a malfunction of an SSC important to safety.

So 96-07 created it. And it's definition 3.9 which says it's a failure to perform a design function. That will then start us on a march, which I will cover in the next -- in the slide that comes after this.

But Point Number 1, there's definitions, approved regulatory definitions, in the Reg Guide -- two Reg Guides, 1.186 for 50.59 and 1.187, or the other way around, for design basis. We're following them. And I hope to demonstrate that we're following them in a very clear and unambiguous way.

Secondly, the rule making is clear. I heard a request for irrefutable evidence. When we go

back and look at the evidence from 1999 for the rulemaking record for the rule we have today, it's absolutely clear. And to be even more direct, there's no semblance of an opening for an alternative view. It focuses on the safety analysis which is taken by your comments distinguishing between the safety analysis report and the safety analysis. The record is clear, it's the safety analysis.

Thirdly, and we just touched on it here what, Neil described, Robinson, and I think your words were, sparse. Was that not? Well, some of the sites are sparse. Some sites have a factor of two or three. You compare Robinson to --

MR. ARCHAMBO: McGuire.

MR. LEBLOND: -- McGuire. Maybe two, three times level of detail. That's not a new problem. That's a new manifestation of a problem that was fixed 20 years ago. It was recognized 20 years ago, and we're running the risk of undoing that fix right here. And finally --

MEMBER SKILLMAN: Well, describe that fix, please.

MR. LEBLOND: Well, I'm -- I'll do it now if want but there's a slide coming.

MEMBER SKILLMAN: Okay, I'll wait.

MR. LEBLOND: That talks about --

MEMBER SKILLMAN: Thank you.

MR. LEBLOND: -- yes. And just so like what I'm telling what I'm going to tell you then I'm going to tell you in the -- a next slide for each one of these. And finally, you'll see that Appendix Delta relies on a technique where you look at the levels of change and then you cascade upwards to a higher functional level. That was taken with your comments earlier today about, oh, you have a new result. Next question is, where is that result.

And that gamut has been used successfully for 20 years within the other criteria -- Criterion 3, and 4 for malfunctions, Criterion 7 for design and basis and, in some cases, Criterion 2 for malfunction of SSC. We're simply using it again under 4.3.6.

So with that, let's start with the expansion of Point Number 1 of having -- next slide. First, a malfunction is a failure to perform a design function. That's a defining term. You might go to Webster's and see, oh, that's the failure of a component to work. That wasn't adequate.

There was 24 issues that we were given 20 years ago that say fix these problems. And one of the problems was we made a definition of a malfunction of

an SSC important to safety. So in order to understand what a malfunction is, you need to know what a design function is.

So what's a design function? Well, what's a malfunction? A failure to perform a design function. A design function has four constituent parts. It either performs a design basis function, which I'll demonstrate as a very high level function. It either supports, a design basis function, impacts a design basis function or is a transient action initiator.

I was taken with some of your comments about well, how do you partition these things? That's a term that's used. It's a defined term. It has four constituent parts. These were negotiated between the team and the NRC during this time period.

MEMBER BLEY: My sense is there's no disagreement between the staff and you, as representatives of the industry, on this definition of a malfunction. Is that correct?

MR. LEBLOND: Well, they didn't mention it. They didn't malfunction of an SSC. They never mentioned definition 3.9, the entire morning. So I don't know I can't speak for --

MEMBER BLEY: They haven't objected to it

in anything that I've read.

MR. LEBLOND: I haven't -- I can't speak to what they think. I just know what we're doing. A design basis function, it was properly quoted this morning, required by regulations, licensee condition or orders or tech specs or accredited safety analysis.

However, when you read that definition there's a footnote, which was not mentioned, and the footnote says this definition comes from Regulatory Guide 1.186. So you can't understand a design basis function unless you go read the Reg Guide from which it generates it.

If I go to the Reg Guide, Appendix Bravo to NEI 97-04, it says, what's a design and basis function? To understand a design and basic function we need to understand the underlying general design criteria which are very high level functions. There's further direct guidance that says no individual component performs a design basis function. They're functionally far above any individual component.

The converse to that is no individual component, by itself, performs a design function -- part of a collective whole. Doesn't mean that a mal -- and when something breaks, it can't propagate to a malfunction. It means that no individual component by

itself performs a design function.

And on Page Bravo 5 of that definition, of that document, it says, how do you figure out whether or not a component has a design basis function. It says the safety analysis, not the safety analysis report. The safety analysis provides the context.

I was at Fermi all week last week and I did a two-day initial class on screening. People have been in the industry two, three years and now they got to learn how to screen. Can you understand the definition of design function without understanding the Reg Guide? No.

So when they get taught this, they're given a copy of these pages that say, here, this is a design basis function. Here's how you orient yourself, design basis function on top, underneath, support, then impact and then action initiators off to the side. It's the very basics of 50.59.

It does not mean, in any sense, would you ever ignore a component contribution. The gamut, the technique that's used has been used for 20 years and we're using it here, is that you look at the contribution of a component at a lower functional level. And then you look at the impact of that component as you go up the functional ladder.

So the example on the slide is if I'm altering a level indicator on a surge tank on a diesel generator or jacket water, the question is how is jacket water cooling impacted? And as those jacket water cooling goes to diesel. And as goes to diesel, goes to safety analysis assumptions. So in no case, in no case for 20 years, if it's done properly, do we ever ignore the contribution of a component at the level of a change -- ever.

And that is interspersed in multiple locations throughout 96-07. And it's specifically identified in Steps 1 and 2 of Section 4.3.6. If I -- isn't that right, I think?

MR. ARCHAMBO: Yes.

MR. LEBLOND: I believe that's right, yes. So Point Number 1, we're just following our notes, lower left hand side. There's approved regulatory guidance 1.186, 1.187. There's definitions there. We're going from Definition 39, what's a malfunction -- failure to perform a design function -- to Definition 33. That's a design function.

And there's a footnote on that definition. To understand design function you go to Reg Guide 1.186. We're just simply following our way through approved regulatory guidance. I'm done with the --

next slide if you're ready.

MEMBER SKILLMAN: I -- well, let's stop.

MR. LEBLOND: Okay.

MEMBER SKILLMAN: This is dandy. Talk to me about a reactor coolant pump.

MR. LEBLOND: What would you like to know?

MEMBER SKILLMAN: Is it a -- does failure to function, failure to pump --

MR. LEBLOND: Good.

MEMBER SKILLMAN: -- constitute loss of a design function or loss of a safety function?

MR. LEBLOND: Well, safety function is not defined in the regulation. So I don't know how to answer the second part. Reactor coolant pumps perform design functions. Why? Because if they fail to function they produce an accident or transient initiator.

Further, there's a whole plethora of basic high level design basis functions that are involved with cooling the core, maintaining pressurizer spray if it's that loop, that would support those design basis functions.

So right off the top of my head, what do RCPs do? There's two hits on a design function. First accident initiator, secondly supporting a wide

range of design and basis functions. So what I'd like to come back to, and you gave me the opportunity, is since a malfunction is a failure to perform a design function, to be able to make this partition, you need to make it expertly.

Now we can now ask ourselves what are the malfunctions I have to think about, because in the case of a RCP, there's now two malfunctions I have to think about. Accident initiators, if the pump trips then we'll have a loss of flow accident. That's an initiator. Or supporting the wide range of design basis functions -- core cooling, you know, cladding and cooling, pressurizer spray control that's another GDC.

So each of those, since a malfunction is defined, then as a failure to perform a design function, then we look at the converse -- it's not performed -- as I march through the Definition 39. Steps 1 through 6 of 4.3.6 accomplish that function. That partitioning and then I am parsing out the pieces and then saying well, now let's think about it, if those functions are preserved or not. Am I answering your question?

MEMBER SKILLMAN: Somewhat. Let's change channels.

MR. LEBLOND: Okay.

MEMBER SKILLMAN: PORV, PORV.

MR. LEBLOND: PORV? What would you like to know? Which kind of PORVs? I mean air operated or safeties?

MEMBER SKILLMAN: Let's take a Target Rock.

MR. LEBLOND: Say what?

MEMBER SKILLMAN: Target Rock.

MR. LEBLOND: Well, that's a trade name. Do you mean --

MEMBER SKILLMAN: It's a --

MR. LEBLOND: You mean like an air operated one?

MEMBER SKILLMAN: Let's take one that's pilot operated, spring, and pilot valve.

MR. LEBLOND: Okay. So it's not the safety? It's the atmospheric?

MEMBER SKILLMAN: Neither.

MR. LEBLOND: It would go directly to the --

MEMBER SKILLMAN: It's a pilot-operated valve like Oconee I, II, and III.

MR. LEBLOND: Okay. Well, it would be another class if it were probably --

MEMBER SKILLMAN: Your theorem is no single component is that function. In that case, in a TMI, it's a single device failed and loss to function.

MR. LEBLOND: Well, what I said exactly was no single component performs a design basis functions. I did say --

MEMBER SKILLMAN: But this one does and so do the codes.

MR. LEBLOND: Well, let me just see. However, the failure of a component of that component may propagate to a malfunction. So in the case of the PORV the failure itself would propagate to a malfunction. So you're actually sort of raising the issue -- sometimes the failure of individual component will propagate up to a malfunction. Sometimes it won't. Sometimes other pieces of the system will accommodate it.

So it's hard to say one size fits all. We need to design a process that can accommodate all these variations. So when I say no individual component can perform a design function, I mean at the PORV is part of a larger system that goes directly to coolant drain tank. It comes off the top of the pressurizer.

I didn't say if the PORV fails I don't get a malfunction. I didn't say that. I said that the design function itself is at a higher functional level than the function of the valve, which is to open.

And so this idea of what functional level do I want to have this, the -- what we're approaching here is what functional level should the rule talk about. What functional level do I want to make the rule control? And what I'm about to talk about is that that's a 20-year-old issue. I helped solve that problem 20 years ago and here we are.

Now in the case of this instance, if the PORV that you're asking about opens up, that will then propagate to a malfunction. That will propagate to a malfunction. That's right.

MEMBER SKILLMAN: I would certainly agree with that.

MR. LEBLOND: That's right.

MEMBER SKILLMAN: Let's go on that.

MR. LEBLOND: That's right. So there's no attempt to try to minimize that. And in the case of --

MEMBER SKILLMAN: Well, what I'm challenging, Peter, is this. Your theorem that the current wording in 6, SSC is really pointing to a

larger group of functional performance requirements that need to be considered to define the safety analysis. That's the theorem.

MR. LEBLOND: No, that's not the theorem. The theorem is that you look at the impact of every component, no matter how functionally low. And then you make the decision what's a different result. You find out if the results at the safety analysis level are preserved. That's the question.

So it's not that you don't -- if there's something wrong with the PORV, then that's going to propagate up to a malfunction at different -- well, I shouldn't be bit. The question here is at what functionally level do I make the decision. Do I make the decision at the component level or at the safety analysis level? Because at the safety analysis you take the impact of the component the smaller level and drive it up to the safety analysis to ensure that the safety analysis remains valid. They're not --

MEMBER SKILLMAN: Okay, now isn't this the crux between your interpretation and the staff's interpretations?

MR. LEBLOND: Yes. Yes, yes. They're saying -- well, I don't want to say what they're saying. I mean --

MEMBER SKILLMAN: I think they know -- I think --

MR. LEBLOND: Yes.

MEMBER SKILLMAN: -- we've touched on it.

MR. LEBLOND: Yes. They're saying you make the evaluation at the component level. And you look at the words, and yes, sir. And I'm about to show you that the rulemaking directly says that you don't do that and this is an old solution that was solved 20 years ago.

It's got nothing to do with digital. It's the same problem we had 20 years ago, and I'm about to show you where it was assigned to us 22 years ago to fix -- and we did. And now we're reopening it. We're reopening that -- reestablishing an error in the regulation that was fixed 20 years ago. And that seems untenable. And I'll let Steve talk about it.

MEMBER BLEY: If you would. The fact that it was 20 years ago, I mean, you can leave that behind. The real question is what matters here.

MR. LEBLOND: Yes.

MEMBER BLEY: And if you focus on the engineering, I'd appreciate it.

MR. LEBLOND: Yes. Well, what I'd like to --

MEMBER BLEY: A little too preachy.

MR. LEBLOND: -- highlight is that the implications here aren't digital. We're here for Appendix Delta. The implications are, here, is what if I want to add a new mechanical interlock to a diesel generator air receiver? So the problems were initially challenged for, well, what if I have now a description of a mechanical component? How do I process any change? So the implications are much bigger than simply digital.

So that's why I'm going back to -- the 20-year discussion is to say that it's not just digital, it's everything. It's everything. Next slide is coming.

MR. GEIER: Yes, I'd like to suggest, Pete, at this point --

MR. LEBLOND: To move ahead.

MR. GEIER: -- completely move ahead to the next slide, I think so. That would be great. Thanks.

MR. LEBLOND: The old regulation use to use the word type.

MEMBER BLEY: I'm a little lost, which old regulation?

MR. LEBLOND: From pre-1999.

MEMBER BLEY: Okay.

MR. LEBLOND: So that meant if you had a new failure mod that, required prior Commissioner approval. So the proposal was to change the regulation from type to result, which it did. The words you have here are from the Notice of Proposed Rulemaking written in 1999.

Now we've been chastised for saying we don't care about the proposed rule. We want the final rule. This is the final rule. When the regulation was proposed in 1999, there were minor changes from the 1999 version to the statements of consideration but not on Criterion 6.

So the words that are here are the intent of the regulation when it was written in 1999. And there it says, unless the equipment would fail in a way not already evaluated in safety analysis -- not the safety analysis report -- there is no need for the NRC to review of the change that led to the new type of malfunction. You wanted -- what was your wording, inconvertible or -- irrefutable. It'll never get clearer than this.

It's talking about what's the criteria, where is the level of the result that I think about for when I trip the trigger for Criterion 6. And it

says in a way not already evaluated in a safety analysis. So where do you make the decision? At the safety analysis level. Doesn't mean that you don't ignore what happened to the PRV but you drive the PRV up to the higher functional level and say, does this now produce a result that's not already evaluated in a safety analysis.

I mean, I don't know how it can get clearer than this. So since 1999, it used to say something different. It used to say type. We're about to talk about that in the next slide. I don't see any other way to read these words. I don't see any other way to read these words. Once again --

MR. GEIER: Next slide or?

MR. LEBLOND: Next slide I think, yes, unless there's a question. Following on the heels of the paragraph I just gave you, remember this also comes from the Notice of Proposed Rulemaking these words are written literally came to the next paragraph. You know, we can only put so much on one slide.

Four years earlier, the NRC staff had given guidance inside Generic Letters 95-02 they said here is how we want you to access failures of components. And they said, taken by your words, we

need to access at the component, at the level of the equipment being replaced.

This is the old way of doing it, if you will. Now the regulation is changing from type to result. So the only legal issue in question here is, what result are we talking about? What's the functional level? Exactly what you're suggesting, where in this perspective in this hierarchy, do I talk about result.

And it goes on to say this is how we used to say it. Here's how we did it in 95-02, and then the words that start with "unless" were added as part of the Notice of Proposed Rulemaking.

So what's the only functional level discussed? The SAR analysis, not the safety analysis report -- analysis -- was truly binding and applicable. So once again, in the course of two paragraphs, two direct citations to the SAR analysis. Next slide, I think unless there's questions?

MEMBER BLEY: Well, a couple of things I don't mean to pick. SAR is Safety Analysis Report?

MR. LEBLOND: Analysis.

MEMBER BLEY: Analysis?

MR. LEBLOND: Right.

MEMBER BLEY: It is Safety Analysis Report

and you're saying it's the back up to it. When you say this is taken from the Notice of Proposed Rulemaking, I assume these were parts of the statements of consideration? Is that correct?

MR. LEBLOND: Well, the -- right, it's actually the Notice of Proposed Rulemaking then starts the public notice period. Then it goes to statement of consideration for the final rule. So this is part of the Notice of Proposed Rulemaking. And then the statement of consideration says if they make any changes from the Notice of Proposed Rulemaking. And so for Criterion 6, there were changes.

MEMBER BLEY: Okay.

MR. LEBLOND: So this is, I mean, you know, I don't want to get too legal here, but this the intent --

MEMBER BLEY: Pretty legal.

MR. LEBLOND: -- of our -- these two slides, when you use the word result, that's what was being adjudicated -- type to result. SAR analysis, on the previous page, says safety analysis. I don't know how it can get clearer than that. So I would say that's irrefutable, in my view.

The other point that I struggle with, candidly, is I've tried to look at the alternative,

I've tried to say well, okay, where have I made a mistake where have I missed something? There's no evidence for using the entire descriptive material. There's no evidence in this to say that result mean anything other than what we just talked about. If you can -- can you back up?

MEMBER BLEY: I was hoping when you said you had thought about it you had thought about could we have -- not with respect to the literal language that's here -- could we have missed something that could be important to safety by coming to this level rather than the lower level?

MR. LEBLOND: Well --

MEMBER BLEY: I was hoping that's what you would focus on.

MR. LEBLOND: This is one of eight criteria. Each of the criteria has a role and this criteria has two parts to it. Greater possibility, there's an element of plausibility, and then that's the sufficiently low we've been talking about.

And then, if it's plausible, then can it produce a non-bounded result. So within the narrow range that Criterion 6 applies, it does do its job. It does do its job. Now but it doesn't do its job without the help of the other seven criteria. Each of

the seven criteria have got a role, and Criterions 6 does play its role.

MEMBER BLEY: I'm just hanging a little bit. These words seem straightforward.

MR. LEBLOND: They do don't they.

MEMBER BLEY: But there is some assurance that the mode of failure can be detected and that there are no consequential effects. Those have to be consequential effects that would affect the safety analysis.

MR. LEBLOND: Absolutely.

MEMBER BLEY: Yes, I would agree with that.

MR. LEBLOND: And we agreed that -- that is --

MEMBER BLEY: But the real key you have to look for consequential effects. They don't --

MR. LEBLOND: Absolutely.

MEMBER BLEY: -- have to be in the original analysis.

MR. LEBLOND: Well, you have to -- that's the interface between the engineering work.

MEMBER BLEY: This is what would take you beyond the original safety analysis.

MR. LEBLOND: Well, this would take you in

the engineering work to say well, you know, do I really understand this mod. So when I make a change, the PORV isn't a good one because as soon as it fails, then we have an issue, yes. But --

MEMBER SKILLMAN: That's why it's a good example.

MR. LEBLOND: Yes, right. But I mean in terms of propagating upward. But taking that, do you understand what -- you know, you're making some changes to the PORV. Do you understand how that can be manifested -- this is an engineering word -- before you come to this effort. So, you know, that's really where Neil would really expand to say, well, you know, have you considered these elements? Is this a part of the engineering work? Have you considered more than that? So you know how to answer this question.

Once you get to this point those technical questions, and I'm trying to give Neil a second to think, these questions should be answered. And, Neil, I don't know do you agree?

MR. ARCHAMBO: Yes, fully.

MR. LEBLOND: All right. So again, it's not -- I've said it so many times but it probably bears repeating. It's not that you overlook these effects. It's that you make the final decision when

it says different result. You make the decision at the SAR analysis level. That's the only issue in play here.

MR. ARCHAMBO: And if I'm not mistaken, Pete, you know, 20, 22 years ago, when they were talking about types, types of failures, you know, if I had a valve in my FSARs that failed open and now I put in a valve that fails closed, by the staff's definition that would be a malfunction with a different result.

MR. LEBLOND: Different type.

MR. ARCHAMBO: Different type, but by their definition laid out today that would come in for NRC approval. Even if it had no effect whatsoever on the safety analysis, it failed at the system level in a different way. So that was -- in their definition, I would call that a malfunction with a different result. What we're saying is that's not where you look at it. And 22 years ago that's where it was looked at and decided that's not the proper place to look at it.

MR. LEBLOND: Right. 20 years ago, there's an example that said if I go from, if I recollect, it's an oil-filled switch to a diaphragm switch or from a switch --

MR. ARCHAMBO: Right.

MR. LEBLOND: -- to -- I don't remember the example.

MR. ARCHAMBO: Transmitter.

MR. LEBLOND: Transmitter. And they said, well, that's a malfunction of a different type and that requires licensing. So that was the issue at the time. Any new failure node at the component level requires license amendment. And so the problem to be fixed was type to result. And, candidly, people declared success.

Nobody thought, you know, these words, you know, my next tag line of my little talk here is if you combine Point Number 1 and Point Number 2, well, this issue of what's a different result has been hiding in plain sight all these years. We just never went and looked at it because, until you get to a digital modification, these issues don't become important.

So going from Definition 39 to 33, follow the footnote. Go to Reg Guide 1.186, look at the Notice of Proposed Rulemaking. It's been there all these years. But until we come to Appendix Delta, we will never had to say well, what functional level does result really mean.

MEMBER BLEY: So if you started where the staff seems to be and said, gee, I put in a valve that fails in a different -- fails open instead of close --

MR. LEBLOND: Okay.

MEMBER BLEY: -- that's certainly something different. But then you're arguing -- you acknowledge that's something different and you follow the safety analysis to see if it --

MR. LEBLOND: Correct.

MEMBER BLEY: -- puts you in --

MR. LEBLOND: Right. A change. And --

MEMBER BLEY: Now, see, 20 years ago we all had PRAs of all the plants and you could do that real, I will say, precisely. If we reflect to the safety analysis in the FSAR, mostly Chapter 15, sometimes it was a different chapter, some of these things weren't even considered in the model. So that's where I'm kind of hanging. You'd had to look and say, if this new valve that fails in a different way carry that up and say --

MR. LEBLOND: Right.

MEMBER BLEY: -- does that situation -- should that affect my safety analysis.

MR. LEBLOND: Right. And to be fair, you know, the three people that really generated what's in

the 4.3.6 is myself, Neil, and Kati. And when we first came up with 4.3.6 we had a table of all the permutations. Because there's a lot of different possibilities about, you know, what kind of function is it; is it quickly manifested.

Does it proceed slowly, you know is there single failure or is it redundant -- go through all the permutations. And I think we came up with eight or nine categories, something like that. Well, we ended up having to say, well, we can't put that many examples in 4.3.6, so some of them fell by the wayside some of them got combined.

But this whole idea of starting with Step Number 1, what are you doing. Step Number 2, go up the functional ladder find one of those four classes of a design function -- design basis function, support, transient initiator.

Which one am I involved with? And then from that point the next four steps go different ways based upon what kind of function you've identified. And, you know, without -- between, Neil and I, we'll be happy to work through any permutation.

But, we certainly can't say it's one size fits all because, you know, we had different, we had eight different -- if memory serves, eight different

combinations of oh, it can go this way, it can go that way. And that's why there's so many examples.

Next slide? If they're ready, I'm ready. This is the point we've been talking about from -- in 1997, and I know you're going to -- this is old school here. One of the problem was, if you tie the scope of 59 to the SAR, not the SAR analysis, because people have differing levels of descriptive materials you get different answers.

Well, you say well, some of them are sparse. For Neil, say well, compare Robinson to McGuire, a factor of two, factor of three. So now, let's say McGuire has a description of some widget -- a compressor or a transformer -- and it fails. And Robinson doesn't. Maybe it's digital-related maybe it's not.

Well, you want to level the playing field. Shouldn't we have the same change treated the same at two different sites? And that's what that means, it says look by focusing on the words, we focus on the words we get uneven application. And Dresden can do something that Comanche Peak can't. Well that's not right. That simply isn't right. How does that make sense for regulations? So we were asked to fix that.

And how do we fix it. We focused on

verbs, functions. What kind of functions, high-level functions, design functions. We're back to the first slide. So now, maybe not everybody has a description of a failed component. Maybe Robinson doesn't and McGuire does. But everybody's got these high-level design functions credited in their safety analysis.

Everybody has those functions. So that is a way to level the playing field, so we have the same change, treated the same as Dresden, as Comanche Peak at Robinson versus McGuire. And notice this discussion is not necessarily digital-specific. So that's the solution. The solution is to focus on verbs, high-level verbs.

And the gamut that I'm about to get to, which was executed in all the other criteria, is to say, if you're going to make the decision at the higher functional level then you got to be sure that when you make a mod way down here, you drive it properly up to the higher functional level so the decision can be made properly.

And that is written in multiple places in 96-07 and it's expressly written in Steps 1 and 2 of 4.3.6. Because if you don't do that it all falls apart. It all falls apart.

MEMBER SKILLMAN: I'm going to repeat that

back. So it's clear --

MR. LEBLOND: Yes, sir.

MEMBER SKILLMAN: -- in my mind. What you just said is even though you're going to drive up to the verb, the design function, you're going to begin at the SSC level --

MR. LEBLOND: Level of change.

MEMBER SKILLMAN: -- and examine that through the entire --

MR. LEBLOND: Process.

MEMBER SKILLMAN: -- upward tier to that function?

MR. LEBLOND: Exactly, precisely correct.

MEMBER SKILLMAN: 10/4.

MR. LEBLOND: Precisely correct.

MEMBER SKILLMAN: Okay.

MR. LEBLOND: And what I want to highlight is that gamut, that technique, that approach was developed 20 years ago, when the next slide is going to say we use it on Criterion 3, Criterion 4, Criterion 7 today with the same rule language as we see in 6.

So we're just simply executing the same approach in Criterion 6 that we used in 7, 3 and 4 because 3, 5, 7 and sometimes 2 make the decision at

the safety analysis level.

For example, Criterion 7 says, is the design basis limit which is at the safety analysis level, is exceeded or altered. There's a paragraph in 4.3.7 that says, be careful you got to cascade upward, and we couldn't agree more.

Finally, on this bullet --

MR. GEIER: If I could just --

MR. LEBLOND: Yes, sir, I'm sorry.

MR. GEIER: If could just add where you're getting at is the whole point is you're not ignoring what happens at the SSC level. It's still being evaluated. It's still being identified. What has changed? Because this is all applicable to mods, changes in the plan.

And so, you still identify it. It's just that you're taking that, you know, what has changed and you're applying it up higher.

MEMBER SKILLMAN: Well, I --

MR. GEIER: And in your yes/no, you know, on the question, that's being applied at the high level just not at that first tier.

MEMBER SKILLMAN: Well, it's clear to me, in order to pull this off, the evaluator has to have a thorough knowledge of the SSC in question. And if

the people are good at their art, they have a documentation trail that's bulletproof.

MR. LEBLOND: I agree.

MR. GEIER: That is what the design process requires in a 50.59 process.

MR. ARCHAMBO: And that's why we set up the six-step process, to walk people through that, because that's absent in the other guidance.

MR. LEBLOND: And lastly --

MEMBER BLEY: I get all of that but you -- I just went back and looked up the rule. And the material you gathered from the proposed rule change --

MR. LEBLOND: Yes, sir.

MEMBER BLEY: -- has -- is a very nice basis.

MR. LEBLOND: Thank you.

MEMBER BLEY: When you read the actual rule, they don't say final safety analysis or safety analysis or safety analysis. They say final safety analysis report on every one of the six, eight criteria.

MR. LEBLOND: That's going to be my next point. That's Point Number 4.

MEMBER BLEY: Okay.

MR. LEBLOND: Yes. I agree, I agree.

MEMBER BLEY: So even though they wanted it to be the other way, they wrote words that allow some confusion.

MR. LEBLOND: Well I'm going to take that point on directly in the next -- as soon as I'm done with my last bullet here, then that's Point Number 4.

MR. GEIER: Point Number 4?

MR. LEBLOND: Well, Point Number 3 or whatever.

MEMBER MARCH-LEUBA: I wanted to ask a question. Back to this question, the analyst has to have the general knowledge of the SSC, but they also need to have a detailed knowledge of the SAR analysis to propagate it.

MR. LEBLOND: Well, they have to understand the -- they have to identify the high-level verb. That's what they have to do. So, for example, in a class I just held last week for initial people, the high-level design basis function is to ensure monitored releases.

What's the change? This is initial class. I'm changing the control mechanism on a balance and control damper. So, the class is expected to go from a balance and control damper control, to balance flow to flow from lesser to greater, to no unmonitored

release, to achievement of the design basis function up to ensure all the releases are monitored.

So, that's for a class that, four hours ago, they couldn't say 5059. So, that's how they're taught. They're taught to do this cascading up. And, if they don't, it all falls apart.

MEMBER MARCH-LEUBA: But my point is, it's one thing if you tell -- you have to 16 hours of this analysis.

MR. LEBLOND: Yeah.

MEMBER MARCH-LEUBA: Another thing is being able to do it.

MR. LEBLOND: Yeah.

MEMBER MARCH-LEUBA: I'm being cognizant of how a failure of a -- And, there is always unintended consequences that you don't prepare properly.

MR. LEBLOND: I agree. I agree. And, I'll tell you, with a class of 29, a fraction of them can't do it. Some of them can't make the connection between some small component and a higher function in a definition of design function. Some -- you know, roughly, 20 percent, say I don't get it. I don't get it.

MR. GEIER: But if I can just interject?

So, the question is, okay, how does a person, you know, that's new, how would they do that? And, the thing is, they go find the right people that can answer those questions.

Because most stations with fleets have safety analysis individuals that that's what they do, is they maintain the safety analysis. And, the design process points them to go there and consult with those people if they can't answer those questions themselves.

MEMBER MARCH-LEUBA: But my concern is, I mean --

MR. GEIER: But it's not done in a vacuum.

MEMBER MARCH-LEUBA: We're supposed to think of safety at a higher level. And, my concern in this process will be that it is very clear that this damper goes into the selection towards that function.

And, you forget there is a little branch that, because the temperature around here or the -- something else happened and you never analyzed it. That a failure causes an unintended consequence that you never think of.

So, unless the process is thorough, I'm telling you there's some good engineers with a lot of experience, there is that risk.

MR. GEIER: That's why it's really important that design, particularly for designs with potential safety significance, it's a team effort. And you need to draw on the expertise of the organization.

MR. ARCHAMBO: Yeah. And one comment to make. When an individual writes a 5090 evaluation at a site, it's reviewed. It's approved. And also -- and I can't speak for every site. I'll speak for Duke.

Every single 5059 evaluation goes through a challenge board. Every single one, whether it's digital or non-digital, it goes through a challenge board of subject matter experts to review it.

And so, you never have a situation where one individual writes a 5069 and files it away and nobody ever looks at it. So, there's checks and balances, as there is to other parts of our design process.

MEMBER MARCH-LEUBA: And, that's good to know. But for consideration that there has to be an emphasis on unintended consequences.

MEMBER RICCARDELLA: Are they done under 10 C.F.R. 50, Appendix B?

MR. ARCHAMBO: That's correct. Yes. We

do have our -- our design process is. And, they have to have qualifications, you know? That's why Pete goes around and teaches. And, I've taken Pete's course many years ago.

MR. GEIER: And, you have to take tests.

MR. ARCHAMBO: And then we'd have, you know, every year we have refresher training on 5059. Because, quite frankly, it's nothing a lot of people do all the time.

That's why we have challenge boards. That's why we have subject matter experts review that work. Because, you know, it might be six months, a year, between the time you did your last 5059 evaluation.

MEMBER BLEY: I heard of something from -- can I mention it? I won't say where it was. But Ron participated on a panel which -- challenge board would be the right name for this.

But they assigned two groups, one to -- for why this was good and one to show why it was different and argue it out. Is that a common kind of practice or this unusual? I've never seen anybody do that.

MR. ARCHAMBO: Well, yeah. I was -- yeah.

MR. GEIER: I can hit this. One of my --

I participated in the development of, you know, an engineering error-type process in back in the early 2000s. It was with INPO.

And, one of the different tools, depending on, you know, if you're a knowledge worker and, you know, what the potential error-likely situation is. But the use of a devil's advocate is what is actually a defined error prevention tool.

It's in there. And, I think these challenge boards have really, you know, kind of taken that on. And, we've done that. I've done that on root causes, where you have a root cause and you take somebody off and have them off to the side.

Your job is to prove why our conclusions are wrong. And, it's a pretty common tool, not just for 5059, but also for design, for design boards, as well as root causes, corrective action within the station. It's become a pretty common tool.

MR. LEBLOND: I would say, if the underlying technical work is accurate, you know, what I would preach -- what we were trying to do is that you can -- different groups should come to the right answer, the same answer, in the same way. That's what we hoped to get to. However, if a mistake is made at the engineering level, if you fail to understand those

effects we were talking about, there's nothing in this process that catches it.

I mean, and I use the example of San Onofre, as the extreme. Those 5059s looked -- they certainly didn't catch the fact that they'd have fluid elastic instability. If they did, they would've had a different result. But they didn't know, and so here we are.

MEMBER BALLINGER: I would contend that that analysis was flawed and that a proper, murder board-type analysis would've picked that up because --

MR. LEBLOND: Me too.

MEMBER RICCARDELLA: A proper what type of analysis?

MEMBER BALLINGER: Well, we were talking about it today. I call it a murder board. We're trying to put a -- wanting to put a detector on the pressurizer surge line, very unusual, to detect cracks. And so, it was non-intrusive.

It was not going to be used for any kind of action that was going to take place. It was just a monitoring thing. And so, we had two groups that were -- one was assigned to say you can't do this.

And then, the other one was assigned to say you can do this and we fought it out. We,

meaning, I was a bystander. I was the person that wanted to do it.

The utility was the one that did the analysis. And that's how that worked. And, if that kind of approach had been taken at San Onofre, they would've picked that up.

MR. LEBLOND: I agree with that.

MEMBER BALLINGER: There's no doubt that they would've picked that up, I think.

MR. LEBLOND: I agree.

MEMBER RICCARDELLA: But again, we're talking 5059. And, it's not clear to me that even if the San Onofre hadn't been done under a -- had been done under a licensed member request, the same thing might've happened. There was a chance the same thing might've happened.

MR. LEBLOND: The fundamental flaw is the technical issue and it passes it along.

MEMBER RICCARDELLA: I mean, we've had other big issues like that, the Mark I -- the BWR Mark I containment program comes to mind. I men, there were errors made in that analysis. And that had nothing to do with 5059, it was just bad engineering.

MR. LEBLOND: Exactly. So, I mean, that gets back to your observations, which I think are

well-taken. You need to know those affects so you know what to cascade upward.

If you don't know those affects, I can't help you. I just can't help you and it's not going to work. I will just tell you right now, it's not going to work.

MEMBER MARCH-LEUBA: Let me put something else on the table that I'm thinking of and it's really different. And, it's what I call time for recovery. It's something that's specific for --

We're all used to working with computers and the computer starts working unusually slow, and you do control, alt, delete, reboot, and it starts working. Take for example, a system data conditioning in the control room.

MR. LEBLOND: Yeah.

MEMBER MARCH-LEUBA: It's a really bad system and you need it for habitability. But if this system were to freeze, the operators would notice immediately. They would get on the horn and they would reset it, and it would start working. So, with this, I'll give you the credit for time for recovery.

MR. LEBLOND: Yes. Interesting. Go ahead. Well, do want -- well --

MEMBER MARCH-LEUBA: That's it. Go ahead.

MR. LEBLOND: One of our examples is the -- two, safety-related, air compressors -- is that the right term?

MR. GEIER: Chillers.

MR. LEBLOND: Chillers that provide cooling to the control room. Okay.

MR. GEIER: Control mainframe.

MR. LEBLOND: Pardon me?

MR. GEIER: Control mainframe -- right. So, we've had a lot of conversation with this. You know, what if you have a software -- now, we talked about common platforms. And, during those conversations, Neil nudged me and said, well, we could make a common platform. We could put the same software and two components. That's true, right?

MR. ARCHAMBO: Yeah. Let me just clarify that.

MR. LEBLOND: So, clarify that.

MR. ARCHAMBO: You have two trains of chillers, two safety-related trains. There's -- you cannot legally take one controller to control both of those trains.

I want to make that clear -- without getting a license and memory request. Because it's not nothing to do with digital. I could do that with

an analog controller. But once I do that, I've reduced -- or independence.

I've reduced independence. And, 9607 will tell you, a single reduction in independence goes for a license and memory request. So, what we're talking about is two analog chillers, separate, completely separate. We put digital controls on each one of those, not the same digital controls.

MEMBER MARCH-LEUBA: But they're exactly digital controls?

MR. ARCHAMBO: The exact same.

MEMBER MARCH-LEUBA: Completely random, but not diverse.

MR. ARCHAMBO: And just to set this example up before Pete goes, is we -- it's a real-life example. You see, we have an -- at one of our plants that talks -- that has enough on the A table that we say is descriptive material.

But it has enough on the A table that says, if one train fails, the other one starts. So now, if I put in both digital controls, and I can't say I'm not susceptible to CCF, where both trains could fail, the staff would say that's a different result.

And, we'd say, not right away it isn't.

We've got to see. We've to see. We've got to propagate that up to the higher functional level. And I'll let Pete finish that, but that sets up the example.

MEMBER MARCH-LEUBA: My claim is that you break the receipt and advance into two classes, the ones that will -- the software failure will be so bad, that it will prevent the second one from starting, and the ones that -- blue screen up there that we said we would fix. And you still have the common cause failure, but it has a much lower priority, if you allow for time to go and push the reset button.

MR. LEBLOND: And, that's what we shared when we went through this is, we actually identified eight, separate classes and permutations of things to come. The solution to that one is, well now, as I climb the ladder, what design basis function do I get to?

And, the example says, you get to the cooling of the reactor protection racks. How long do you have from the time that those two coolers fail to start, to the time where those reactor protection racks exceed their designery.

And, I think in the example we said 20 minutes, didn't we? Anyhow, so the system has to be

designed, as you directly pointed out, with some way to say, hey, how come these things didn't start? I don't know. Mash the bypass button.

Get one of them running. And, we have another and off you go. So, that then says, you have a soft. So, now in the language of 5059, do you have a malfunction? Yes, both fail. But does it propagate to a different result at the safety analysis level? No.

MR. ARCHAMBO: And, one thing I'd like to point out about that is that's -- you know, that was giving an example of things that -- equipment that don't show up in a safety analysis. But as Pete just pointed to you, that doesn't mean we don't consider it.

MR. LEBLOND: Exactly.

MR. ARCHAMBO: It failed. We have to see what affect that has on equipment that is in the safety analysis. So, it doesn't get ignored, just because it doesn't show up in a safety analysis.

MR. LEBLOND: And, let's say, somebody proposes a mod to say, I don't know. I'm not going to put that bypass in. I'm just going to put in my two little software panels.

And, I'm going to have a little screen

here, and a screen here. Well, it becomes dumb-mod, just like any other dumb mod. And now, they've designed a mod that they can't implement. So, another common problem is, people designing a modification that they can't implement.

And so, there would just be another example of saying, well, you've got to come up with one way. You know, at lunch, Steve said, well, you could just always go mash them, MCC, if it comes to it. But if you design it so you can't do that, then you've designed a mod you can't manipulate on your own and, just like any other mod, it's a dumb mod.

MEMBER SUNSERI: But in those examples that you're citing that -- where now you're introducing a human element, where before there wasn't one, right? So, I mean, you're going to propagate now too, right?

MR. GEIER: So, part of the process -- and this is actually before you even get into the 5059. If you do the technical evaluation of this particular mod and you look at that and you say, okay, can you -- in that type of scenario, can you rely on manual action, or operator action to go do that within that time period?

And, you have to do a human reliability

evaluation to determine of that's the case. But you also look at other types of things, whether it's defensive measures or coping. And, quite honestly, you know, we talked -- when I was talking, we talked about this technical document that we need to replace NEI 16-16.

That's the hole that that's going to fill is what type of design attributes, in addition to the ones that are already listed, that can be utilized to able to result and to say that, even if I have common cause failure, I can cope with it or I can take an action so that it will still perform its function.

MR. LEBLOND: And, in the point of the six steps where we -- remember, I told you, after you get to step two, they go different ways. And, if you follow the path, it goes through this.

There's a statement that says that any actions have to be what's called interdependent with the mod. So, if you create a mod that's got a start bypass, you've got to have a procedure for start bypasses, for starting it, for operating it.

And, you have to train the people on operating it. So, those are requirements of the underlying mod. Those are all interdependent. And so, therefore, you can -- you know, that that passes,

whatever you elect to use has to be interdependent.

Now, let's say, oh, I want to open that door and put a fan in it? That's not interdependent. That's a comp measure. That's not allowed. So, that distinction is made in the six steps.

MEMBER SUNSERI: Right. But -- and I'm not a human factors expert. But that -- the first part that you just described, just seems to me as though it's independent of what else might be going on as a result of that trip.

So, the operator might be distracted. The workload may have exceeded -- this new element may have exceeded their capacity to act, right?

MR. LEBLOND: Yeah. That's the HRA assessment that you'd end up doing, by looking at all of those.

MEMBER BLEY: And, I see you are an expert. You've got it all.

MR. ARCHAMBO: Well, the truth is, there are procedures for that. Even with our analog chillers, we have a procedure in case both of them fail, that tells them exactly what to go on.

And, the first step they do is go out and try to restart it. That's the first step. I mean, those exist. That's already taken into consideration.

MR. GEIER: And then, quite honestly, your, if you lose both, you know, you lose both your 303 and shut down anyway. So --

MR. LEBLOND: In 96-07, there's guidance as to how extreme and how, I think, about expended reliance and manual action. It's under criterion two and the guidance in the six-step process points back to that to say, make sure that whatever manual actions you ascribe, they're reasonable.

So, when I roll play act, what would say that this manual action has to occur within two minutes. It would fail that test. Oh, I've got 20 minutes to make this test. Well, it would pass that test.

So, that decision point is written in the process. Step four, if I remember correctly. The third bullet on this slide, Reg Guide 1.186. Its purpose is to distinguish between descriptions that are part of the safety analysis and descriptions that are part of the descriptive material.

And, it says that the plant's response to an individual comp own's failure is part of the descriptive material, not part of the safety analysis. So, in the past, we've heard -- and I think it's Mr.

Riccardella had made that distinction between safety analysis and the --

In earlier meetings we had heard, well, that descriptive material is part of the safety analysis. I didn't hear that today. That Reg Guide provides a direct example, on point, that says, if you have a component that fails, and here's what the plant does, that's described as descriptive material.

MEMBER BLEY: All very interesting. You promised me when you got to this slide though, it would explain why, despite all the language in the --

MR. LEBLOND: It's the next slide. We've been on this slide a long time.

MR. ARCHAMBO: Your time has come. Your ship has come in.

MR. LEBLOND: But you are correct. I did promise that. You are exactly correct. I've described an approach where we start with a low-level component and cascade upward. And, we heard this morning well, look at the language of the rule.

It doesn't fit. You know, it says, as evaluated by the UFSAR. Criterion 3 and 4 focus solely on those analysis. Seven focuses solely on RCS barrier accent analysis, but yet, look at the language, the language, as described in UFSAR.

Malfunction previously evaluated in the, previously evaluated. So, those three criteria, and sometimes also, Criterion 2, depending upon the type of change, they cascade up to the safety analysis. But yet, the rule language has this global wording. So, the question now is, how do I read that? Do I say --

CHAIRMAN BROWN: Hold it. You say the rule language. Are you talking about --

MR. LEBLOND: This is the rule language, the 59-rule language.

CHAIRMAN BROWN: So, that's the one you're referring to?

MR. LEBLOND: Right. Right.

CHAIRMAN BROWN: In other words, Criterion 6 you're talking about? I see the first three. But, I mean, when you say, you're trying to relate it also -- this same language to Criterion 6 as well?

MR. LEBLOND: Criterion 6 has the same kind of language. It says, than any previously evaluated. That's what it says.

MEMBER BLEY: In the FSAR.

MR. LEBLOND: In the FSAR. And you'll see the same language here, previously evaluated in the FSAR -- previously evaluated in the FSAR -- as

described in the final signal analysis report.

MEMBER RICCARDELLA: But what about 5, which is of a different type than any previously evaluated in the FSAR.

MR. LEBLOND: Well, 5 -- an action of a different type would be an action for which you don't have a safety analysis. So, it doesn't really make our observation here. But what I'm trying to say is that this approach of starting at a lower functional level and going to a higher functional level has been around for 20 years.

But Criterion 5 would be, I don't have a safety analysis to compare to so, therefore, it's an accident of a different type, so it doesn't really fit this slide.

MEMBER RICCARDELLA: Well, but it -- I understand, but I mean, that seems like it opens the door to having to consider accidents that aren't considered in the FSAR.

MR. LEBLOND: Well, it does. It certainly does.

MEMBER RICCARDELLA: Okay.

MR. LEBLOND: That's the point of 5 is that, let's say that you've never brought a gas line, a natural gas line, on site before and you want to

bring in a 10-inch line. There's a Reg Guide that lets you bring small lines.

Well now, have you now created the possibility of a natural gas explosion on site? Yes. Well, what do I bound that with? What safety analysis do I look at? Well, there is none. So, that becomes an accident of a different type. That's why, in 3, 4, and 6 -- just look at 7.

It says, a design basis' limited efficient product barrier is described in the FSAR. If you go to the guidance for that it says, go find the safety analysis that demonstrates the integrity of that barrier. So, is that described in the final safety analysis report? Yes.

But it's not the description. So, it's the same technique. It's the same approach, where you start with a component at the lower functional level and go all the way to a higher functional level, to the safety analysis level.

So, there's nothing new. There's nothing in the language of Criterion 6 that impedes us from doing that. If you want to say Criterion 6 impedes us, well then, 3, 4, and 7 are also in trouble too, because they use the same global language, inside the rule language itself.

So, a regulatory guide is an approved way to meet a regulation. We're just following the definitions. We're following our notes. And now, in hindsight, this issue of where are the results for Criterion 6? It was hiding in plain sight all of these years.

We just never went and looked for it. I'm ready for the summary if you are. So, the big finishes. We're using previously approved definitions. And they were created 20 years ago, and they admit the rule.

The rulemaking record is clear. There is no evidence for a contrary view. It says, the safety analysis is the level at which you make the decision, unless the equipment would fail in a way not already evaluated in a safety analysis, there's no need for on-site review.

I don't know how it gets clearer than that. Reliance on safety analysis results levels the playing field, as Neil said. Do some sites have sparse description, other sites not? How do we make sure we have consistent treatment?

That solution -- and that's not a new problem. It's an old problem that was fixed 20 years ago. And finally, finally, finally, this approach of

starting at a lower component level, making sure you have all of the technical information, driving to the safety analysis level and say, is this analysis still valid?

It's omnipresent in 9607 today. So, we're just using the same approach in Criterion 6, that we used in 2, 3, 4, and 7. Not every change is at 2. So, with that, Mr. Geier, I'm done.

MEMBER BLEY: While I don't disagree with your line of reasoning throughout, I see how others would say, despite all of these words from the old, throwaway discussion that led to the change in the rule that used safety analysis or the SAR analysis, when they actually wrote the rule, they didn't write it that way.

They wrote it FSAR and left it. So, those arguments, as good as they sound, don't seem to have been carried through when they wrote the rule. And I don't know why that happened and probably none of us do.

MR. LEBLOND: I do.

MEMBER BLEY: Okay.

MR. LEBLOND: I do.

MEMBER BLEY: Then tell us.

MR. LEBLOND: Then, go back to Peter's

slide, to the -- can you back up?

MEMBER BLEY: Was there a substantive reason or was there --

MR. LEBLOND: Well, it's because this is the language that was similar to the old language, to the old rule. And then, I mean, just take Criterion 3, it talks about consequences, okay?

9607 said, the same issue we had, had to resolve. At what level are you going to make the answer? At what level are you going to make the decision? And the answer was, in every case, you drive the answer up the safety analysis level.

So, Criterion 2, c(2)iii and iv, they focus on the dose analysis described in -- So, where do I find the consequences of an actually previously evaluated? I find them -- 9607 is an approved way to meet a regulation.

It says it on the bottom of every Reg Guide. It's an approved way to implement those words. You go to the safety analysis, which is where you find the consequences of an accident previously evaluated. But what if I find some words? And 9607 says, they may be in the FSAR, but it's not the consequences of an accident previously evaluated. The Reg Guide defines that to be the safety analysis.

And that approach was used for these criteria and we're just using it again for Criterion 6. It dovetails with this idea of the design function has got to be a higher functional level.

MEMBER BLEY: I think your technical argument's pretty good. I don't know if you're a lawyer or not, but I'm not sure if the legal arguments are as good.

MR. LEBLOND: I'm not a lawyer, but I believe the arguments are --

MR. GEIER: Actually, we didn't bring our lawyer with us. Actually, the NEI, Legal, and OGC have been talking about this and I think they're reaching alignment as well.

MR. LEBLOND: I'm not a lawyer but --

MEMBER BLEY: Charlie, I don't want to jump the gun, but I'm going to, a little.

CHAIRMAN BROWN: Go ahead.

MEMBER BLEY: We agreed. Well, you and I agreed, sitting at the table earlier today, that probably this isn't the time for a letter. If this disagreement is pushed through and comes out one way or the other, it's fairly significant.

And, I'm not sure that I agree with myself that we shouldn't write a letter addressing that one

issue. I have no idea where we'd fall out as a group. But we could have some impact in that area if we wrote something now. We wouldn't later.

CHAIRMAN BROWN: Well, if you expect me to write that in two weeks, you've lost the bubble, because I'm lost again.

MEMBER BLEY: We can write it later than two weeks. We don't have to write it at this minute.

CHAIRMAN BROWN: Right now, I have totally lost the bubble on the interactions of these.

MEMBER BLEY: Maybe we ought to have a session at the full committee meeting ourselves to talk about this and see if we have a consensus that would drive us to want to weigh in on this issue.

Because I think, assuming we can weigh in later, might be wrong. We might have missed the boat. And let's talk about it some more later. I'm sorry for the diversion, folks.

MEMBER REMPE: Could you clarify your last comment about your lawyers and OGC lawyers are getting closer to alignment?

MR. GEIER: Right. So, because we know that a lot of this is very legal language, we have -- our legal staff, we've briefed them, and they've contacted their counterparts at OGC to talk through

this particular issue to see if they can reach alignment. And my understanding is they're getting to that point.

MEMBER REMPE: So, the decision may dissipate in the next couple of weeks?

MR. GEIER: I don't know. I just know from what our NEI legal has told me that -- but I don't know what that means in NRC process, as far as if they reach agreement or alignment.

MEMBER MARCH-LEUBA: Shouldn't you convince the technical stuff and then talk to the lawyers?

MR. GEIER: Well, we've tried. We wouldn't be here if were successful in that.

Yeah. This has all been multiple -- and we understand that OGC is a step in the process to a review of the Reg Guide.

MR. LEBLOND: This is all old news. This is not a new -- I mean, those folks back there could probably give this story as well as I could.

MEMBER BALLINGER: Let me ask a metallurgical question. Is there any practical difference between the two, with respect to safety? In other words, if you take industry's proposed approach versus the staff's opinion, is there any real

difference between the two, with respect to what could happen?

Could we miss something by taking one or the other of approaches that would impact safety? I mean, I know -- are you in raging agreement, but disagreement?

MR. ARCHAMBO: No. Nothing could impact safety, but the implication, if we went the way that the staff is proposing, it may open up modifications that would have to come in for license amendment requests that would really push the --

MEMBER BALLINGER: Okay. If there's no impact on safety, then the choice is pretty easy. But my question is, is one or the other approach -- is there a possibility that one or the other approach would result in something significantly impacting safety down the road?

MR. ARCHAMBO: Yeah. I think what -- maybe what you're asking is, say, using our approach, could we possibly miss something that the other approach wouldn't miss?

MEMBER BALLINGER: Or the other way around.

MR. ARCHAMBO: Or vice versa -- and I think the answer is no. I think the issue that we

have is two things. One is, the way Pete laid it out is what was decided 20-something years ago, and it's the way it's been being taught and used for the last 20 years.

The proposal that the staff put on the table would likely put a number of modifications that we might want to do, come up with a malfunction with a different result, at the system level, not at the safety analysis, but at the system.

MEMBER BALLINGER: That's -- again, that's the -- to me, that's the nuts and bolts level. Now, it may be very expensive in one case.

MR. ARCHAMBO: That's what's critical to the industry. That's what's detrimental to us though, as an industry.

MEMBER BALLINGER: Yeah.

MR. ARCHAMBO: That's why when we say -- if we get this document endorsed, with the exception of Section 436, it really diminishes the usefulness of this document.

MEMBER BALLINGER: Maybe I'm just not being clear. Somebody else has got to say this.

MEMBER REMPE: So, let me try and ask your question. When you discussed this with the staff, could they cite one example saying you -- if you did

give an example, you'd miss it with your approach. Our approach won't miss it and it impacts safety. Did they ever give you a concrete example?

MR. ARCHAMBO: No. And -- no, they have not. And, they're sitting behind you. They might want to chime in. But to the best of my knowledge, no.

MR. LEBLOND: Let me try to make their argument for them.

MEMBER BLEY: To me, they're here. We could hear it from them.

MR. GEIER: The term miss is -- you know, remember, I think in your term, it misses going in for an LAR, versus being evaluated.

MEMBER REMPE: No. I'm talking about safety. They talked about a couple of prior examples where they said, you missed the need to document it. They documented it, as Pete asked. It wasn't determined to be a safety issue. I'm asking, did it impact safety?

MR. LEBLOND: Well, I think I can make their argument for them.

MR. CARTE: There's a couple of premises wrong with that question. We actually haven't put forward a position. So, what we're discussing is

NEI's position and our objections to it.

And they're speculating our position, based on our objection. So, it's a little funny like that. But no. We have not given that. But part of the issue is, what's coming up is, if you create a new situation that's adverse, we review, in general, as our role, the measures to mitigate that situation.

So, if you create a situation and you say, yeah, but it's not really that bad because we do this, this, and this to mitigate it, then we're really not evaluating or -- what they do in response to adverse, new adverse condition.

So, it's not that -- I disagree with a lot of their characterizations of our positions. And I disagree with their use of quotes, because I think they took them out of quote context.

But one of the problems in this discussion is we've always partitioned this thing in terms of two types of discussions, licensing, which is a bunch of logistic-type discussions and technical. And we've never really gotten down into technical.

And if you get down into the weeds of technical, then you can start parsing these malfunctions in terms of safety system malfunctions, non-safety system malfunctions. But we never go to

those discussions. We're just always arguing at this, one syllogism applies to all cases, when you have very different, specific cases in the plant.

So, the short answer is no, we have not pointed that out. But we've never really engaged in detailed technical discussions, because we've never gone down that path.

MR. MORTON: I want to emphasize something that Norbert has said in terms of, one of the challenges we had when reviewing Appendix D, is that oftentimes, Appendix D is taking things out of the full context of partial quotations.

So, to take a look at the entire definition of safety analysis in 9607 and the entire definition of design function. Because the presentation kind of leads you down one specific pathway, with a consideration of design functions being the sole subset focus of design functions.

That's where the staff part -- because there's an entire definition of design function and it's not just about design pieces function, similar to the definition of safety analysis.

There's other aspects to safety analysis, not just some of the descriptive material and/or accident analysis. And, taken within that context,

leads us down to some of the reasons why the staff disagrees with the totality of the approach in that, with this process. So, I just wanted to clarify that.

MEMBER RICCARDELLA: Excuse me. While you're up, could I -- why has this issue on 3.6 come up solely in the aspect of digital INC and Appendix D?

I mean, it seems to me this question of whether a component gets considered at the component level versus at the systems safety analysis level, is broader than -- so, has this come up in considerations of the regulation in general?

MR. MORTON: You nailed it. And, that's one of the concerns the staff had is that this is the Appendix, specific to digital INC. And addressed the challenge of digital INC as with regard to implementing digital INC models under 5059.

Much of what's in the guidance and criterion for the Criterion 6, under 436, is not specific to digital INC. They are generic interpretations of the basic rule language. So, that it's beyond the scope of digital we're talking now. This entire meeting is really about interpreting 5059, not digital INC in terms of the exceptions we took.

Take generic interpretations within an appendix of the larger body of 5059 guidance. So, you

kind of hit the nail on the head, in terms of where.

MEMBER BLEY: It seems to me that you folks would serve yourselves well if you wrote some type of white paper, really taking this apart and looking at it. And, kind of the same -- I mean, you presented slides here, but I don't know if you have a white paper on this from NEI as well.

And, they pointed out that the two Reg Guides, 186 and 187, 1186 and 1187 -- I don't recall seeing those called out in your document, but I could be wrong about that.

But I think that if either of you wanted to prevail on this for whatever reasons you want to prevail, getting some clarity on what's the same or what's different across this discussion would be very helpful, to us and to the commission one day. Yeah. You've got to do your name.

MR. BEAULIEU: Yeah. I'm Dave Beaulieu. I'm the Agency's 5069 person.

MEMBER BLEY: We need it for the transcript. That's all.

MR. BEAULIEU: There's a couple of things that they leave out. You raised one point about that the 5059 rule says what it says. It says, any previously evaluated in the FSAR.

It doesn't say in the act of an analysis. It doesn't say -- it doesn't limit it. It just says in the FSAR, okay? That's for one. So, if they want to narrow it, that would require a rule change, for one.

And, not only in 5059, but 10 C.F.R. 5034 is for the regulation for the FSAR. And that -- the regulation for the FSAR gives a definition here of final safety analysis report. And, it says that each applicant for an operating license shall include a final safety analysis report.

It says, the final safety analysis report shall include information that describes the facility, presents the design basis and limits on its operation, and prevent -- and presents the safety analysis of structure systems and components and of the facility as a whole.

They say -- it's two pieces, which is consistent with any NEI 9607, the definition 312. It says, also within the meaning of this definition, for the purposes of 5059, is supporting FSAR analysis that demonstrate SSE design functions will be accomplished as credited in the accident analysis.

So, they make a distinction between the accident analysis and the safety analysis are the

supporting FSAR analysis. That's exactly what the 5034, C.F.R. 5034 would say. And so, they would need -- to take their approach, they would need role-making because what they're saying is contrary to that as well.

MEMBER BLEY: I'd come back to, there's a lot of disagreement about what words in the rule mean and how to interpret them. It seems the two sides here could come together on what's important to safety and then figure out what needs to be done with respect to the rule. Otherwise, somebody's going to be really mad when this is over.

MR. BEAULIEU: You're correct. So, we're saying -- our approach was saying, if you have a -- if the chapter says, malfunctions are evaluated, generally evaluated, as potential single failures. That's true.

So, you go to the system. You go to the system description and it says single failure. If you have a common cause failure of software, that's a loss of the entire safety system. That's a non-functional safety system.

And that requires -- that's a different result. That's a safety issue. That requires prior NRC approval. That's a common cause failure of a

safety system. It's not functional.

MEMBER BLEY: But the arguments we've been hearing don't seem to deal so much with common cause failure as with how you parse out the results on a particular SSC.

MR. BEAULIEU: Right. Because the result -- Criterion 6 is really not -- why is this a digital issue? It's because of software common cause failure. And other mechanical systems are not faced with common cause failure as directly or as commonly.

MEMBER BLEY: But we have a record of them on common cause failure. We have data. We understand those common cause failures better than we do the digital ones.

MEMBER BLEY: Yeah. Right.

MEMBER RICCARDELLA: Excuse me. Wouldn't the concern that you just talked about come out of this cascading up concept that NEI talked about? I mean, if what you said happened, and you have common cause failure that affects multiple systems, I mean, I would think that if their evaluation right, as they cascade up, they'd say, yeah. And, it would affect the safety evaluation.

MR. BEAULIEU: Well, a malfunction is a failure to perform design function, previously

evaluated. The guide says, malfunctions are previously evaluated, generally single failure.

You go to the chapter and it says, oh, a single failure? It has the failure modes. It typically has failure modes and affects analysis. It says, hey, single failure? What if you lose one train? The results of that are -- it says, you can withstand that because you have a redundant train at the 100 percent capacity.

So, that's what's described in the NSAR. And now, you have a different result, a loss of a safety system. And, it is printed in the accident analysis. And, it might not be described in the safety analysis.

NEI 9607 doesn't -- also mentions that. It might not be specifically described in the safety analysis, but it is discussed as like, single failure of a system, as a system description.

And, that's the safety issue is a loss of an entire safety system without NRC approval. It's the same as -- that's not -- a loss of an entire safety system is not a different result as it just -- it doesn't pass the straight base test.

MEMBER RICCARDELLA: But that's what I assumed they meant when they said they were going to

consider that failure as it cascades up and has an effect on the -- that's what I thought.

MEMBER BALLINGER: Another metallurgical comment. Are we getting into a situation where it's my PhD against your PhD? I mean, should you guys all go to Starbucks and argue this out?

I mean, I just don't think that there's much of a difference other than this is the way it is, and we think it should be different. The end result is exactly the same. And so, it seems that there should be a way to --

CHAIRMAN BROWN: No. It's not, exactly. If you listen to -- you all guys are so far ahead of me that I couldn't write a letter on this if I had to, if I can't get it down to what the hell the darn problem is to start out with, okay?

It's all results from evaluating common cause failures as applied to digital instrumentation that's installed in various systems in the plant, regardless of the characteristic, whether it's a protection system, which we've kind of shoved off to the side, or whether it's a control system, a chiller system, radiation detectors, individual little pressure sensors and whatever else.

That's what we've gotten down to. The

5059 reads very clearly. It talks about malfunctions of an SSC, with a different result, whatever that means. But my meaning is, I have SSCs that operate a certain way.

I put in digital stuff, it doesn't operate that way anymore. It fails in a manner that we have not considered. Is that -- that's kind of where -- did I get that right? That's where --

MR. ARCHAMBO: And, that's part of the problem.

CHAIRMAN BROWN: Oh, don't give me part of it. Bob, forget process. I don't care about process right now.

MR. LEBLOND Well, you have it wrong.

CHAIRMAN BROWN: Well, I don't have it wrong. You fail something. It fails and with a different result. It doesn't say who's result. It doesn't say whether it's a result on the FSAR.

It doesn't say whether it's a result on the SSC. It doesn't say. It just says, fails with a different result. Me, in my simple, I would think the SSC has failed with a different result, in terms of its performance.

MR. ARCHAMBO: And, that's where we were 22 years ago.

MR. LEBLOND: That's where you were 22 years ago.

CHAIRMAN BROWN: Okay. Now, the conflict here comes about in that, if you get something that's got a couple of trains and you have a common cause failure, and it now has -- it's failed in a different manner than what's been considered throughout the entire set of whatever FSAR we have, they're looking at this as, okay, hold it.

That's a different result. Therefore, bang, you fail. You've got to come in. NRC ought to look at it. You're saying, King's X, that's not -- we're going to elevate to the next level up, look at the FSAR or the safety or whatever analysis -- I get confused between safety analysis and FSARs.

They are different things. Chapter 15 vice the overall FSAR. You all are elevating that in my mind to the next level up and say, NRC, you don't need to talk to us or we don't need to talk to you, as long as the next level up analysis, whatever it is, safety, FSAR, says, it doesn't matter. It's okay. We're bounded by something, but we've completed our analysis. That's my concept of what's going on here.

MR. GEIER: You still take the failure.

CHAIRMAN BROWN: Huh?

MR. GEIER: You still evaluate the failure. You've elevated up at this decision.

CHAIRMAN BROWN: No. That part of your evaluation is you recognize that as a failure, but you finish your evaluation and say, hold it, I move up one. And you escalate everything, everything, to the FSAR level. And, if that's okay, then fine.

We go ahead and do our job and NRC is back over here doing whatever they normally do. And, they'll get -- they'll find out you've changed the system, whatever it is. Did I actually put this in a framework that's --

MR. LEBLOND: And they would say, make the --

CHAIRMAN BROWN: Hopefully, I will get a transcript that I can remember this.

MR. LEBLOND: They would say, make the decision at the component level, at the descriptive words.

CHAIRMAN BROWN: Yeah. They want to say, because you've now failed at a different mode, now forget the FSAR. You have to come in and tell us what you're doing, and we'll get you -- that means an LAR.

MR. LEBLOND: And, what we tried to say is, that issue propagates everything. It propagates

to everything, not just digital stuff. It propagates to everything.

CHAIRMAN BROWN: I'm not so sure. No. The natures of common cause failure is, I mean --

MR. ARCHAMBO: No. If I have a valve today, mechanical, nothing digital about it and it fails open and I want to replace that with a new valve, a mechanical valve, nothing digital, and that new valve fails closed. It might not have any impact on the plant, nothing.

CHAIRMAN BROWN: That's a different --

MR. ARCHAMBO: They would say, that's a malfunction with a different result. We're saying it's not. You look at -- it might be, but you've got to propagate it up. Now, it may be in a non-safety system that I don't care how it fails. I don't care. But that would have to come in for NRC approval.

That's what was hashed out 22 years ago because that's a different type, a different type of malfunction. That was a different type. That's what we're trying -- again, 22 years ago, there was a group of people that hashed all this out.

Pete was in there. And, we're going back to 22 years and we're throwing everything out the window that was discussed 22 years ago and resolved.

CHAIRMAN BROWN: You're going back to the slide where it talked about the words in 5059 were changed for the type?

MR. ARCHAMBO: Yeah. Well, the actual -- yes.

CHAIRMAN BROWN: Well, there's still a type in there on one of these.

MR. ARCHAMBO: Yeah. That's an accident of a different type. That's a different --

CHAIRMAN BROWN: It's an accident of a different type. Yeah. Hold it. I'm just trying to -- this conversation has been so far, you know, that we went through. I just had to get it down to the simplistic, what are the pieces we're talking about?

What's the mode of failure, you know, or the different result that we're talking about? And now, you're considering it, elevating it. They're considering stop right here. Do not pass go. Don't collect $200. Send us a letter.

MEMBER BALLINGER: Let me pull the string a little bit further then. Let's say you get a different result. You have to come in for a license amendment.

CHAIRMAN BROWN: Yeah.

MEMBER BALLINGER: As part of the

evaluation for the license amendment, is that more like to end up the next level up, satisfying a criterion, just like they're saying?

CHAIRMAN BROWN: They could come in with a license amendment and NRC says fine, go ahead and do it. That's exactly what the process would be. Or the NRC could come back and say, King's X.

Naughty, naughty, mustn't do. That's another foul on you and you can't do it. I'm sorry. I had to have a little humor in here. I was just -- my brain's frying right now.

MEMBER BLEY: You missed some of it.

CHAIRMAN BROWN: Well, I wasn't going to do that to you because, you know, you've got to help me. I just wanted to make sure I had it characterized right because I got lost in all of the elevated discourse with all of these other rules. I had to take it down to some simple, very simple-minded concept, that an old guy like me can comprehend.

MR. LEBLOND: You could summarize it by saying, if I changed the words of the FSAR, then I have to ask for amendment.

CHAIRMAN BROWN: You've lost me on that. What do you mean if I --

MR. LEBLOND: If I change the description

of a failed component in the FSAR, then I need an amendment.

CHAIRMAN BROWN: Unless the description is not in the FSAR.

MR. LEBLOND: Unless -- well, that's -- you don't need an application then. But now you can see, with that uncertainty, what you --

CHAIRMAN BROWN: I understand your conundrum.

MEMBER BLEY: Can I ask you folks something completely different?

CHAIRMAN BROWN: Hold it. Before you ask that, are we stopped on this subject?

MEMBER BLEY: I think they're done with it. I don't know if we are.

MEMBER REMPE: I think there -- I get the point that there's a financial concern, is why you're up here talking about this. But do you -- I think I'm hearing from the staff, and it's just a legal thing, that if what you're proposing is inconsistent with the existing words in the regulation and you understand their conundrum that it's hard to regulate in something that's not quite consistent with the regulation.

Is that also part of this puzzle that

we're gather today? I mean, they cited 10 C.F.R. 5034 and other places, not just 5069. And, it sounds like that they're struggling with how we'd implement this if we go with what NEI says.

MR. LEBLOND: A regulatory guide is an approved way to meet a regulation. So, if we throw out previous Reg Guides, well then, it's anarchy. Then, you're back to reading the rule regulation. And the rule regulations, in general -- that's why you have guidance.

That's why you've got consensus standards. And so, that's -- so on the bottom of every regulatory guide, it says, this is an approved way to meet a regulation. And we're following that. We've taken that seriously.

MEMBER REMPE: But you don't think they have a valid point at all?

MR. LEBLOND: What?

MEMBER REMPE: I think you're saying they don't have a valid point at all.

MR. LEBLOND: No. They don't. I don't think so at all and I think that we are unwinding the clock.

MEMBER BLEY: And they've anchored back to Reg Guides 1187 and 1186.

MEMBER REMPE: And 1186 just basically endorses this NEI document.

MEMBER BLEY: And staff is referencing other things so they're kind of at loggerheads, at this point.

MEMBER REMPE: They definitely are at loggerheads, but I just -- I'm trying to understand if there's any way for compromise.

MEMBER SKILLMAN: Let me make a comment, Charlie. Hey, Charlie, let me make a comment. When you say they're winding back the clock, where were you 22 years ago.

MEMBER BLEY: I was working on this.

MEMBER SKILLMAN: Twenty-two years ago, I was Director at TMI. And, my colleagues and I were required, under oath and affidavit to sign a 5054F letter to confirm that TMI 1 was in conformance with its FSAR.

That meant, under 50.9, go to jail if you're lying. That's what that meant. And the reason the NRC required that is because, prior to that time, well-meaning people, like us, were doing 5059s and, many times, doing them incorrectly.

And like, 1,000 paper cuts can kill you, little by little, the design and licensing basis of

the plants, all of the plants, were departing from one another. And the NRC said, time out. If you don't want to go to jail, conform your FSAR.

You've come the 22 years ago so many times, the one stunning event that was in that time period was the requirement for injury to sign the 5054 F letters, for a good reason.

When you say, they're winding back the clock, I would say, they're saying, keep your licensing and design bases certified. And, when we say -- and I'm speaking for the staff, but I'm speaking for Dick Skillman over 50-something years.

When they're saying SSCs, they're saying, be certain that your knowledge of the detail is sufficient so that when you do make that change, that change is consistent with the overall safety envelope of the plant. I think that that's all that they're saying.

MR. LEBLOND: We agree with that. We don't disagree with that.

MR. ARCHAMBO: No disagreement.

MEMBER SKILLMAN: So, I'm kind of with Ron. What's the fuss? Why can't this be aligned in a way that you are successful, and the staff is successful? Because you want the same thing. And

when you say, if there's a pushback on the wording, industry's going to back away, I would say, I don't think so because there are smart people in industry who will say, as long as we understand, they are requiring that the configuration management program clearly identifies the change.

Then, I would think the NRC staff would be satisfied. So, it seems to me that the two teams are so close together, that there should not be a whole lot more effort to heal this. But as you speak, it sounds like it's a colossal wall.

MR. LEBLOND: Well, I think it is.

MEMBER SKILLMAN: It doesn't need to be.

CHAIRMAN BROWN: Quite frankly -- and this is my opinion now, Dennis, based on -- I really hate, at this stage, to sit here and try to put -- to have us frame this discussion down one side and the other.

And then, say here -- put them together and say, whatever. I would rather have NRC and industry put together the one, two, three, and why they can't come together. In other words, what is the logjam? What is the thing that we lose? And so, they both -- and so, we understand that.

MEMBER BLEY: I would too, unless there's a forcing function here that's going to toss it up for

a commission decision soon that we could have some impact on. And I don't know what the schedule is for this going forward.

CHAIRMAN BROWN: Well, my point is -- my reason is to try to -- I mean, literally, the one hour between everybody else circling around here, I lost the bubble, literally. I have lost what I have --

MEMBER BLEY: You would have lost it if was two hours. So --

CHAIRMAN BROWN: You're right. I'm just -- my point being is, unless we can frame it in a very simple, straightforward way -- if we have to branch here and then, branch there, and then branch here and refer to 22-years ago.

And, you know, it's going to get lost. The point that should be made will get lost, if you can't have a nice, clear transition from the specific problem. They want to stop at the different failure mode, end-result failure mode of the SSC. And that requires an LAR. Industry wants to stop at the safety analysis if there's no impact in the plant.

What is the compromise? It's either you agree with one or the other. The commission would have to do that. But why isn't the compromise, in my own mind, ensuring that the details of that are

embodied, somehow, in the licensing basis, the new licensing basis, so it's very clear and it doesn't get lost.

So, it's part of -- even though they don't submit an LAR, there ought to be a formal attachment or something that goes into the licensing basis that says, this was this. It is now this. We've evaluated it. It's okay, based on these analyses. That, to me --

MR. LEBLOND: Well, the issues going to be updated. That does -- I mean, all of these needs to go back.

CHAIRMAN BROWN: But if you back years ago -- like you say, if you rewind for -- is it 22 years? That was luck. People had to go back and find that and dig it out then because it was not consolidated.

MEMBER BLEY: Because 40 years ago, nobody kept these up to date.

CHAIRMAN BROWN: Oh, absolutely.

MEMBER REMPE: Charlie, there's an individual from the staff who's been standing back there.

CHAIRMAN BROWN: I know. I just --

MEMBER REMPE: Okay.

CHAIRMAN BROWN: I've got eyes in the back

of my head. You've already told me twice. I'm not going to lose Wendell. He'll be okay. I get -- all I'm trying to do is to get the point across that there can't be five pages-worth of convoluted discussion, trying to get to the end-point game.

MEMBER BLEY: You're trying to write the letter before we even talk about it.

CHAIRMAN BROWN: If I've got to write the letter, it better be easy for me to write, because otherwise, it's not going to get written. I couldn't go through all of that dog and pony show that you guys do.

MEMBER SUNSERI: Can I make a point?

CHAIRMAN BROWN: No. Let Wendell --

MEMBER SUNSERI: This will be about whether we have a letter or not.

CHAIRMAN BROWN: Oh, okay. I'm sorry, Wendell. You'll get a shot here.

MEMBER SUNSERI: Essentially, what I hear the discussion is about is setting the threshold for when a change goes to NRC for notification and proving, before it gets implemented, right?

CHAIRMAN BROWN: LAR -- yeah.

MEMBER SUNSERI: That's what we're talking about. I think I've heard it pretty clearly expressed

in here, that ultimately, safety is going to be preserved because either the licensees will have a process that is acceptable, or it will come over to the NRC to determine whether it's acceptable. And, in no case, will an unacceptable change be made.

CHAIRMAN BROWN: That's the theory.

MEMBER SUNSERI: So, my question then is, from a nuclear safety perspective, is this an issue that the ACRS should be weighing in on, because all we're talking about is the threshold on when it comes over to the regulator?

CHAIRMAN BROWN: We've got to talk about that ourselves.

MEMBER SUNSERI: Okay.

CHAIRMAN BROWN: Okay, Wendell, sorry.

MR. MORTON: Not a problem. Wendell Morton, NRC. I just wanted to get some additional context because we're getting very deep into the weeds here, but we need to really remember what was Appendix D submitted to us for, and it was to address challenges in 5059 for both screening and the evaluations.

CHAIRMAN BROWN: For?

MR. MORTON: For digital modifications to plants. And the screening section of Appendix D, it's

actually very specific on various aspects of digital and how they affect the screening. It talks about combining of design functions and how you do screen criterion for that.

It talks about introduction of software and saying, "Well, just because you introduce software doesn't mean it's adverse, but here are some additional considerations." It talks about a number of other things, HSI, for example, so it's actually very specific to things that are challenging about digital and design and how you address them for 5059.

When you get to the evaluation -- and it does a good job of doing that, and there's exceptions or clarifications there in that section of Appendix D. It's when you get to the evaluation criteria that we're kind of getting beyond what is this doing here for digital I&C? What specific challenges with digital I&C are you addressing and how are you connecting them?

And that's when we get into the conversations about what Pete was talking about, safety analysis, design basis, function. These are not things specific to digital I&C, but they're being discussed within a digital I&C appendix.

Really that's more appropriate for

discerning whether you should be addressing NEI 96-07 itself if you think these interpretations need clarifications there, not in an appendix to the Reg Guide on that particular --

MEMBER BLEY: I don't think you guys said that anywhere that we've had the opportunity to --

(Simultaneous speaking.)

CHAIRMAN BROWN: In the NEI --

MR. MORTON: Correct.

CHAIRMAN BROWN: -- document, not the Reg Guide.

MR. MORTON: Correct, because mainly these are just generic 50.59 issues. These are not specific to some challenge in digital I&C. So when you're talking about the definition of safety analysis, well, that's not necessarily digital. That's a general issue no matter what design discipline you're talking about.

That's better handled within 96-07, not in an appendix to the Reg Guide for it, and that's where we come to part ways with NEI on a number of these different topics, and that's the beginning of where we start when you're getting into debating whether you're including design basis function of a subset of design functions or if you're including all design functions.

That's not a digital I&C specific discussion, yet it's in Appendix D now, and we've been challenged to deal with it in a generic context in something that was specifically targeted toward digital I&C mods.

I just want to make sure the ACRS has that context for Appendix D that in one regard, the screening section does a very good job of connecting specific digital I&C challenges and how you address 50.59. The evaluation goes into a much broader context beyond just digital. I just wanted to clarify.

CHAIRMAN BROWN: While you're up there -- I don't know if you're the right one to be up there. I think I heard Stephen say that they expect 16-16 to have a draft out this summer?

MR. GEIER: Right, the replacement for 16-16 later this summer.

CHAIRMAN BROWN: And that would be a final report?

MR. GEIER: And that would be the technical information primarily on how to address CCF using additional design attributes.

MEMBER BLEY: What's the schedule going forward for this process? Does it go to the

Commission? Where does it go and when does it go?

MR. MORTON: You mean with regards to the technical document they're referring to?

MEMBER BLEY: The whole thing.

CHAIRMAN BROWN: You mean Appendix D?

MEMBER REMPE: Appendix D.

MEMBER BLEY: Appendix D. Start with Appendix D.

MR. MORTON: Well, that, right, we don't have a technical basis document right now for us to really include in the schedule, so the review --

(Simultaneous speaking.)

MEMBER BLEY: Well, you have your own RIS that you're counting on, but you have a draft Reg Guide that says, "We endorse this, but we're worried about the following 10 things," or whatever it is in there, and one of those 10 is the one we were just talking about for the last two hours. Is that about ready to -- does it go to the Commission when you're done with that Reg Guide?

MR. CARTE: So the current schedule is for it to go out for public comment, a draft for public comment at the end of April.

MEMBER BLEY: And that's the Reg Guide?

MR. CARTE: And that's the Reg Guide, and

so then there's 60 days for a comment period, and then I don't know after that.

CHAIRMAN BROWN: Is the Reg Guide in Appendix D?

MR. CARTE: The Reg Guide qualification in Appendix D, the qualifying endorsement of Appendix D, and then it has 60 days for a public comment period, and then it's a little bit up in the air in terms of depending on what the comments are, but if there are --

(Simultaneous speaking.)

MEMBER REMPE: Well, what's going on between the lawyers? We heard from them that the lawyers and OGC lawyers were interacting. Is that going to affect the release?

MR. WATERS: So this is Mike Waters. First, Appendix D is not going to the Commission for any type of approval. We're following our normal regulatory guide update process.

CHAIRMAN BROWN: But the Reg Guide --

MR. WATERS: We're endorsing a proposed guidance and taking exception. We're following that process right now, so there's no plans to go to the Commission on that.

We have noted in the past that we're

bordering on policy issues, much broader policy issues than the ones we're trying to get at. This is a broader policy type of interpretation, so it's not a program for just digital I&C. It's something bigger. We want to avoid that to facilitate the near-term digital modifications that we need.

With respect to legal counsel, I'm not aware of any discussions among our legal counsel and their legal counsel.

MEMBER REMPE: Coming to any resolution, so that's a surprise to you.

MR. WATERS: Yes.

MEMBER BLEY: But if you sent the Reg Guide to the Commission without a SECY that laid out these broader issues that they might weigh on first --

CHAIRMAN BROWN: No, they weren't going to the Commission with the Reg Guide.

MEMBER BLEY: The Reg Guide doesn't get approved by the Commission?

CHAIRMAN BROWN: No, they were just going to issue it after they --

MEMBER BLEY: That's what I was asking.

CHAIRMAN BROWN: Yeah, the public comment --

MEMBER BLEY: They just issue it?

CHAIRMAN BROWN: Yeah, they would --

MEMBER BLEY: Okay.

CHAIRMAN BROWN: That's their normal process for a Reg Guide. They're endorsing it as to how to take action and that's it. It was not going to the Commission.

MEMBER BLEY: Okay.

CHAIRMAN BROWN: So, but, I mean --

MEMBER BLEY: That's what I was trying to get at.

CHAIRMAN BROWN: The broader issue, the policy issue that you're talking about, the example was he's got to put in a valve that's normally open and then you take it out. You put in one that feels normally closed. That's the broader policy issue in terms of it got a different result. Now that's into the mechanical world as well as -- it's not just CCF is the point.

MEMBER BLEY: Where I'm hanging up, Charlie, and why I suggested we might want to write something is right now, this Reg Guide has the exception we've been talking about for two hours.

CHAIRMAN BROWN: Yeah.

MEMBER BLEY: And at the same time it goes out for public comment, there's going to be pressure

on multiple sides coming on the staff and the Commission, I assume, because we've heard NEI's side of this being that you're not going to get any submittals for -- nobody's going to go in for mods, digital I&C mods with it written this way. That's probably an overstatement, but for the trickier ones, that might be true. I'm just --

CHAIRMAN BROWN: Well, it's all wrapped up in the integrated actions, the action plan that's all about this --

MEMBER BLEY: Yeah, but that's --

CHAIRMAN BROWN: -- modernization and --

MEMBER BLEY: That's going slower than this is going.

CHAIRMAN BROWN: I know. I'm well aware of that. If you want, we can talk -- do you want to talk about -- do you want to decide in full Committee whether we're going to write a letter or do you want to try to do it now?

MEMBER BLEY: I want to talk about it during full Committee week sometime.

MEMBER RICCARDELLA: We can talk about it, but, I mean, the subcommittee has to make a recommendation.

CHAIRMAN BROWN: I'm just saying the

letter is not going to be prepared for May 1.

MEMBER RICCARDELLA: No, no.

MEMBER BLEY: There are things I don't want to talk about here that I would talk about there.

CHAIRMAN BROWN: That's fine. I have no problem with that.

MEMBER RICCARDELLA: I guess I have a question. Under the current 50.59, the way, and forget about digital I&C, and the associated NEI 96-07, would the example that was cited about a valve that fails open versus fails closed, would that require a license amendment request?

CHAIRMAN BROWN: This is I&C. This is not common cause failure. This is a different result.

MEMBER RICCARDELLA: Yeah, would that automatically require a license --

(Simultaneous speaking.)

MR. BEAULIEU: The guidance is very clear. A new failure mode is not a different result. It's explicit.

MEMBER RICCARDELLA: Okay.

CHAIRMAN BROWN: So that was a red herring that you just threw out there?

MR. BEAULIEU: Yes, that's right.

CHAIRMAN BROWN: Okay, I just wanted to

make sure.

PARTICIPANT: Well, no, no, no.

CHAIRMAN BROWN: Well, that's what he's saying.

MR. BEAULIEU: Just so it's clear, it's a different failure mode. The valve fails open and now it can fail open or closed. That's a different failure mode. Under the old 50.59 prior to 1999, that used to be a license amendment, but now no longer. It only matters whether the result of that new failure mode is bounded --

CHAIRMAN BROWN: Failure mode.

MR. BEAULIEU: -- is bounded, is a different result.

MEMBER RICCARDELLA: Bounded by what?

MR. BEAULIEU: By any previously evaluated in the FSAR.

MEMBER RICCARDELLA: Okay.

MR. BEAULIEU: Anywhere in the FSAR.

MEMBER RICCARDELLA: So then why is that any different than what they're proposing?

PARTICIPANT: It's not any different.

PARTICIPANT: It's not.

MEMBER RICCARDELLA: Why is that different than what they're proposing?

MR. BEAULIEU: Well, they want to say, "Oh, it's only accident analysis evaluation."

CHAIRMAN BROWN: No, no, no, no, step back.

MR. BEAULIEU: Okay.

CHAIRMAN BROWN: Why is a CCF that has a different result, which is a different mode of failure, if all of the trains fail as opposed to just one train, different than having a valve fail closed as opposed to open?

MR. BEAULIEU: Oh, because a different result. Before, it's a failure of one system, and now -- and that's what's analyzed, the failure of one system. Now it's a failure of the entire safety system. That function and that safety system is gone. That is a -- that has not been evaluated --

(Simultaneous speaking.)

CHAIRMAN BROWN: Well, no, I'll take issue with that, okay, because you could have a four train system.

MR. BEAULIEU: Right.

CHAIRMAN BROWN: It might not be a protection system. It could be some other system where you really wanted it, and because of the common cause failure, you could fail two trains as opposed to

four.

MR. BEAULIEU: Yeah --

(Simultaneous speaking.)

CHAIRMAN BROWN: Because the -- well, no, no, they operate asynchronously. Is the data all the same? The specific things that cause -- if you're talking about a computer getting confused, they do get confused, okay, particularly the platforms can depending on the nature and how they're programmed, but the idea that all four of those are going to get confused at the same time, I don't know. If that's the likelihood --

(Simultaneous speaking.)

MR. BEAULIEU: The technical argument. Yeah, that's the --

CHAIRMAN BROWN: It's a likelihood or possibility.

MR. BEAULIEU: Bingo, it's a qualitative assessment.

CHAIRMAN BROWN: It's a qualitative assessment, therefore --

(Simultaneous speaking.)

CHAIRMAN BROWN: My point being is that common cause failure sounds like a similar circumstance to a mode of failure, not necessarily a

fatal failure, but similar to the mode that a valve fails. If you're trying to make the mechanical versus a digital electronics type of comparison, then that's the way I would broach that argument.

I mean, you could make the argument that there's a lot of different ways --

MR. BEAULIEU: Yeah.

CHAIRMAN BROWN: -- to assume whether you should have different software and different piece parts within even a reactor protection system.

MR. BEAULIEU: Yeah, the only mechanical type equivalent would be a cross connect between two mechanical systems where a single failure could disable both trains, so that's this kind of thing. You're right. A different failure mode --

CHAIRMAN BROWN: Well, I don't know. If you had a bunch of relief valves, and you had replaced them all, and now the new failure, there was a common cause failure mode for those, and why couldn't they all fail at the same time if it's another design that hadn't been used before?

MEMBER BLEY: Or if you go back 50 years, scram relays.

CHAIRMAN BROWN: Circuit breakers, scram breakers.

(Simultaneous speaking.)

MEMBER BLEY: -- had a whole set of them at a whole plant in German all melted.

CHAIRMAN BROWN: Oh, is that right?

MEMBER BLEY: Yeah.

MR. LEBLOND: Just the facts that Neil gave started with the premise that says, "I had a valve that used to fail open. Now it fails shut." The words changed. It's a different result.

So the question now begs do you make the decision based upon that description or some other functional level? That's the issue. So you want a simple one sentence statement, that's it.

So if the result of a description of a component failure changes, does that mean a different result or do you drive that impact up to some higher level like you do the other criteria?

MR. ARCHAMBO: That's correct. That's it. No red herring.

CHAIRMAN BROWN: No, I understand that, but I was just trying to compare the valve circumstance relative to what we perceive a CCF is because all you hear about is common cause failure of software.

MR. ARCHAMBO: Right, and let's say this

--

CHAIRMAN BROWN: I'm talking about in the digital common cause failure world. I mean, that's the software. That's the one we're working on right now. Of course there's common cause failures in other worlds.

MR. LEBLOND: Now you can see why we were so worried because that logic applies to everything, not just common cause.

MR. ARCHAMBO: Yeah, but say that valve has a design function that's spelled out in the FSAR. It has a design function. It doesn't have to be safety related. It doesn't have to be train related, non-safety, it has a design function, and the description in the FSAR said this valve fails open.

Just because I put a description in there, that's just the way it failed. Somebody decided to write that description in there and now I want to put one in because that one --

CHAIRMAN BROWN: We're trying to help you, by the way.

MR. ARCHAMBO: I understand. I'm just trying to drive this home.

CHAIRMAN BROWN: We're trying to come up with the right result and trying to help in at least

making a decision. That's all.

MR. ARCHAMBO: But if I put one in there that fails closed, that's a malfunction, failure to perform a design function perhaps, could be, with a different result.

MEMBER BLEY: You know, I think this issue of level playing field, although that's not the way I would have put it, that a plant that goes to the effort to give more description has to do more when it comes to making a change is --

CHAIRMAN BROWN: Gets penalized.

MEMBER BLEY: -- is counter-safety. It's not helpful. Somehow dealing with that is important.

CHAIRMAN BROWN: It's not counter-safety. It's just harder to make changes.

MEMBER BLEY: Well, it is for the plant that doesn't have all of that detail, you know, they don't even have to consider whether --

CHAIRMAN BROWN: From that standpoint, it's a counter-safety.

MEMBER BLEY: Yeah.

CHAIRMAN BROWN: Potentially a counter-safety.

MEMBER BLEY: Potentially.

CHAIRMAN BROWN: I believe this dead horse

doesn't have any legs, skin, or --

(Simultaneous speaking.)

PARTICIPANT: It's still alive. It's still alive.

MEMBER BLEY: I did want to ask these gentlemen --

CHAIRMAN BROWN: Are you going to shift subjects? Are we done with this now for right now and we'll discuss this at the open meeting?

MEMBER BLEY: That's what I would recommend.

CHAIRMAN BROWN: I'm just glad I've got a transcript because I know have at least a half an hour bubble when I may even understand what I said.

MEMBER BLEY: Given the extreme discussion for the last couple of hours, clearly you've read the Reg Guide, the draft.

PARTICIPANT: No, we haven't.

MEMBER BLEY: Oh, you haven't seen it? It's not out?

CHAIRMAN BROWN: No, it's not up here.

MEMBER BLEY: We're the only ones who have seen it? Well, now it's public, right? No, it's still not public?

MR. LEBLOND: No, we haven't seen it.

CHAIRMAN BROWN: It's with OGC, right? Is it with OGC?

MEMBER BLEY: Well, then the question I was going to ask you is irrelevant, so.

MR. LEBLOND: We can give an irrelevant answer.

CHAIRMAN BROWN: I have not asked any questions on one point. I had a couple of questions myself on one point, but it's really -- this has been sucked up in this black hole.

MEMBER RICCARDELLA: Will it be public soon, by the time of the full meeting?

CHAIRMAN BROWN: Yeah, they're going out for public comments at the end of April, and our full committee meeting is the first week, so we'll have -- just let us know if it doesn't go out so we don't -- but you're going to be at the meeting. You're going to give us --

MEMBER RICCARDELLA: Well, we have it. The question is will they have it?

MEMBER REMPE: Well, what we have though is going to be different than what it currently exists at.

CHAIRMAN BROWN: Information meeting still for the full committee meeting?

MEMBER BLEY: Everybody who cares is probably here, well, not quite.

CHAIRMAN BROWN: Yeah, but we still have other people that have to vote on something by the time we --

MEMBER BLEY: I would think the only reason we would have the full committee brief is if there's any possibility we would want to write something.

MS. WEAVER: This FRN has already gone out.

MEMBER RICCARDELLA: I'm sorry?

CHAIRMAN BROWN: The FRN has already gone out she says.

MEMBER BLEY: That's the reason why we'd do it.

MS. WEAVER: You could cancel.

MEMBER RICCARDELLA: No, I think we should. I'd like to hear it. I'd like to get --

CHAIRMAN BROWN: Well, we've got, what --

MEMBER REMPE: But again, they're going to be revising what we've seen for the Reg Guide, so there will be a new one come out the week before, and so it would behoove us all to take a look at that document so some of our questions can be focused.

MEMBER BLEY: Yeah, that would be nice if we got it a week ahead. Even if we don't though, it's a small enough document. If the staff could walk us through the changes, that would be helpful.

MR. WATERS: We'll be happy to give you the document as soon as it's publicly released, and to the extent practical, we'll step you through any substantive changes between that version and the version you have right now.

CHAIRMAN BROWN: Okay, how do we get NEI's position in the full committee? Do we have them --

MEMBER BLEY: They could come and make comments after they hear it for the first time, right?

CHAIRMAN BROWN: You mean -- well, they have already heard it for the first time with us. They've heard it once.

MEMBER BLEY: Well, they haven't read the whole Reg Guide.

CHAIRMAN BROWN: Oh, oh, from a Reg Guide, but, I mean, the issue is not -- you all haven't actually seen the words in the Reg Guide yet.

MR. GEIER: It's not a new issue. This has been discussed, you know, for several months.

CHAIRMAN BROWN: Well, the issue is in a separate letter of comments.

MR. GEIER: But we haven't seen the actual write up then, yes.

CHAIRMAN BROWN: Was that letter with the comments, was that public?

MS. WEAVER: Yes, it was, and I sent it to everyone.

CHAIRMAN BROWN: But not the Reg Guide? I know, I've got it.

MS. WEAVER: Yes.

CHAIRMAN BROWN: It's in my little brain thing here.

MS. WEAVER: Yes.

MR. GEIER: Yes, there's a letter that was written in December, mid-December that we have where they described their position.

CHAIRMAN BROWN: Mine doesn't have a date on it, so I have no idea when it was written.

MR. GEIER: It was December 15, 14, 15, something like that.

CHAIRMAN BROWN: Okay, where you all discussed this different --

PARTICIPANT: Summarized.

CHAIRMAN BROWN: Summarized comments and the major disagreement, right, that was public?

PARTICIPANT: That's correct, yes.

CHAIRMAN BROWN: So they have that?

PARTICIPANT: Yes.

MR. GEIER: Yes, we have that.

MEMBER RICCARDELLA: This isn't going to the Commission, so if we were to write a letter, it wouldn't be to the Chairman. It would be to the EDO, right?

MEMBER BLEY: Let's talk about that.

CHAIRMAN BROWN: The full committee, right? We'll make a decision on that later. You don't have to decide that now.

MEMBER RICCARDELLA: No, I just --

CHAIRMAN BROWN: It sounds like --

MEMBER RICCARDELLA: For my edification --

(Simultaneous speaking.)

CHAIRMAN BROWN: -- for a letter. It's just a matter of when we --

MEMBER BLEY: I think it would -- most likely, we would write a letter after public comments if we wrote one at all.

MEMBER RICCARDELLA: Well, earlier you said --

(Simultaneous speaking.)

PARTICIPANT: It would really behoove you guys to get together and talk about it.

MEMBER RICCARDELLA: -- you said you wanted us to chime in before though.

CHAIRMAN BROWN: After our brief with the full committee --

MEMBER BLEY: I said there are reasons why we might want to.

(Simultaneous speaking.)

CHAIRMAN BROWN: We don't have to fight about it.

MEMBER BLEY: And I think we have to talk about them in closed session.

CHAIRMAN BROWN: No, but they haven't gone after this particular --

MEMBER BLEY: That's just me.

CHAIRMAN BROWN: -- tooth and nail, I mean, you know, a couple of bottles of wine or whatever it is.

MR. GEIER: We'd be happy to get together and keep discussing this, and hopefully reach a resolution.

MR. WATERS: So part -- well, I don't want to get into the meeting to be honest, but part of the challenge is we have to talk in generalities. We talk about valve changes. We talk about diesel generator water levels. These are electronic engineers. We're

not mechanical engineers.

We have asked to have specific examples where it's not feasible to demonstrate common cause failures sufficiently low. That's the first way you demonstrate it. What are the systems talking about? What does the FSAR say? And walk us through why and how you address this with a different result.

We have not had that conversation to my knowledge, so part of our challenge is this talking in generalities and making broad decisions that may have different precedent setting for all systems, talking about specific systems. So we're on schedule to issue, kind of doing facility implementation, but it's challenging.

And this is Mike Waters' personal view, not of the NRC, that it's hard to talk in generalities without talking about specific upgrades and needs or criteria that becomes important in the decision.

Again, we focused the last year and a half on the pathway to demonstrate the common cause failure is sufficiently low for these digital systems and you don't get to this criterion six conundrum. That's what we had focused on.

MR. ARCHAMBO: Yeah, one thing that would be helpful too is if the staff could come up with an

example where, using our six-step method, something would fall through the cracks. That would be very useful because we don't see it.

In fact, we think that six step method is very robust and that things won't fall through the cracks, so we would be interested in that feedback as well.

We do provide some examples in Appendix D that show things that go through that six-step process that screen in and some that, or, I mean, need a license amendment request and some that don't, but it would be very helpful to see something of the converse.

MEMBER RICCARDELLA: You're using the word screen, but --

MR. ARCHAMBO: I'm sorry, evaluate.

MEMBER RICCARDELLA: Evaluate.

MR. ARCHAMBO: It's been a long day.

CHAIRMAN BROWN: Still got fuzzy logic from that standpoint.

MEMBER REMPE: We still have people on the line.

CHAIRMAN BROWN: Yeah, I know. We're not finished yet.

MEMBER REMPE: Okay.

CHAIRMAN BROWN: Okay, any other diversions at this particular point? Have we finished the process we've gone through? If so, the -- where is Kathy? Where did she go?

PARTICIPANT: Are you ready to open the line?

CHAIRMAN BROWN: Yeah, open the line and we'll go to the phone first here. We have smoke signals. In the age of technology, we have smoke signals and Morse code on the glass window.

PARTICIPANT: While you're doing that, you could ask for comments from the public in the room.

CHAIRMAN BROWN: Well, I guess I could. Is there anybody in the room that would like to make a comment, please? I think the answer to that is no, correct? Okay, now we will wait for the phone. Is there anyone on the phone line? Could you just say something so we know the phone line is actually open?

PARTICIPANT: Yes, the phone line is open.

CHAIRMAN BROWN: All right, would anybody that's on the line like to make a comment? Okay, hearing none, Kathy, go close the phone line. One more -- what have I missed? I don't think I've missed anything. We'll just go around one more time, Ron, we'll start with you.

MEMBER BALLINGER: Yeah, I think there are some larger issues that we need to discuss. I think I'm probably reading Dennis's mind a little bit. So, but I thought the discussion was very enlightening and really solidified the main issues, which I think was a good thing. I think that we -- I think there's resolution.

CHAIRMAN BROWN: Okay, Dick?

MEMBER SKILLMAN: Thank you, Charlie. I want to commend the NRC staff, NEI, and Pete there for your work. Thank you very much. As contested as this might seem, this is how the ACRS completes its work, so thank you.

CHAIRMAN BROWN: Matt?

MEMBER SUNSERI: I'd like to also extend appreciation for both the staff and the industry for the unvarnished discussion that we had today. Thank you.

CHAIRMAN BROWN: Pete?

MEMBER RICCARDELLA: You know, I guess I'm trying to see both sides of the picture, you know, and when you say well, we're going to restrict the evaluation on item six, question six, to things that are considered in the safety evaluation, which I interpret as Chapter 15, that, to me, is a very

prescriptive set of events and accidents that may or may not be relevant.

But I wonder why question five doesn't then come into play where it says, "Create the possibility of an accident of a different type than previously evaluated," and so it seems to me you've got both bases covered if you consider the question five along with question six.

CHAIRMAN BROWN: Well, it's FSAR. Is there a difference between the FSAR and a safety analysis?

(Simultaneous speaking.)

MEMBER BLEY: FSAR is final safety analysis report.

CHAIRMAN BROWN: And that's safety analysis Chapter 15, right?

MEMBER BLEY: Well, that's part of the FSAR, but --

CHAIRMAN BROWN: I know it's part of the FSAR, but it's a part within the FSAR that's the Chapter 15 accident analysis, the design basis analysis.

MEMBER BLEY: Yes.

CHAIRMAN BROWN: Okay. Okay, so I'm not sure what you meant by restricted. I thought it was

within the FSAR based on the way the words read in item six, in all of the items.

MEMBER RICCARDELLA: Yeah, but industry is telling us, well, no, they want to interpret that as the safety evaluation within the FSAR and not the entire FSAR.

CHAIRMAN BROWN: So I missed the point.

MEMBER RICCARDELLA: Oh, yeah.

CHAIRMAN BROWN: That's another fine point that I missed.

MEMBER RICCARDELLA: It's not very fine.

CHAIRMAN BROWN: You mean just on the safety analysis, the Chapter 15 analysis?

MEMBER RICCARDELLA: That's the big issue, yeah, but I guess I'm less concerned about that when I consider questions five and six together.

MEMBER MARCH-LEUBA: Can we follow this discussion because I think you want to expand it? I mean, what you're saying is their language says if it's in the FSAR, if it is written down in the FSAR, you should consider.

What you're saying is if it was considered during the analysis to generate the FSAR, then we'll consider that analysis, which is always larger than what was documented in the FSAR. That's where we go

into more detail or less detail.

MR. LEBLOND: Well, our position is that the decision is made that the safety analysis was Chapters 15, 6, and sometimes 3.

MEMBER MARCH-LEUBA: But I thought you said --

MR. LEBLOND: So that's our position is in the safety analysis contained in the FSAR.

MEMBER MARCH-LEUBA: But I thought you said that some plants don't document all of their safety analysis and that some have more detail than others, and therefore by saying the safety analysis, you are doing more than was documented.

MR. LEBLOND: Some plants have much more detail beyond that. Everybody is pretty consistent on the safety analysis in 6, 15, and 3. Everybody is pretty consistent with that. That's why you level the playing field by using that subset.

Where the big variation comes in is this plant will have a description of maybe a failed component. This one has five tables of it.

MEMBER MARCH-LEUBA: Right, but you want to restrict it into just Chapter 15?

MR. LEBLOND: And 6 and 3, right.

MEMBER MARCH-LEUBA: Then I'm with Pete.

I don't like it.

MEMBER RICCARDELLA: But again, what I said was consider that in conjunction with item five, question five.

MR. ARCHAMBO: Now, just to be clear, we're not saying that we want to restrict it to this point. We want to follow the rule, the guidance as it was applied 22 years ago. We're not changing that, so this is nothing new. You know, we're not trying to restrict it. This is nothing new for us in Appendix D.

CHAIRMAN BROWN: Well, but the rule says FSAR. It doesn't say safety analysis. The safety analysis is part of the FSAR. So I don't know what was 22 years ago, but it was the FSAR then. All you did was change different type to different result.

MR. ARCHAMBO: That's why this argument was --

CHAIRMAN BROWN: You keep saying 22 years ago, but it says FSAR, not, and based on the discussion, safety analysis. It was a subset.

MEMBER BLEY: Charlie, the first stuff they did was laid out, the reasoning language that went with the rule change, at least the part of it they wanted us to see, that kind of defined what those

words meant, and those definitions were analysis.

MR. LEBLOND: And we used a Reg Guide which implements the rule, so that's what a Reg Guide is for is to implement a rule.

CHAIRMAN BROWN: No, I know sort of what we do with Reg Guides. I just don't have the 40 years of background in the commercial world. Joy?

MEMBER REMPE: So I want to also express my appreciation to the staff and NEI for the presentations and explanations today. I'm glad I was here for the entire meeting, but as I think about what's going to happen at the full committee meeting, I'm guessing you'll have a couple of hours at most for this discussion and it would be good for us to think about how to best focus that presentation.

I'm guessing since the staff is going to be having a new Reg Guide, but they said earlier they may focus on the remaining exemptions or exceptions to the guidance in your document, but I think you might want to ask members, especially I think Dennis may have some suggestions on what should be focused on in those couple of hours.

CHAIRMAN BROWN: Yeah, obviously we can't do the whole 46 pages of their presentation. It needs to be reduced in terms of what gets presented. I

really want them to focus on this particular issue in one way and frame both sides of the argument, not just their own.

MEMBER BALLINGER: Might we consider delaying the full committee meeting by a month or so because the Reg Guide is going to be coming out almost coincidentally with the full committee meeting?

MEMBER REMPE: I think that would be good.

MEMBER BALLINGER: And somebody -- you know, maybe there's a little bit of time to read things and --

MEMBER RICCARDELLA: That's a good suggestion, Ron. So you're suggesting we postpone it until June then?

MEMBER BALLINGER: Yeah, I mean, I don't know what the time is that we have allocated during the June full committee meeting.

CHAIRMAN BROWN: But to me, we could do that. I mean, this is a Reg Guide that wasn't going to the Commission. They're going forward. They're going to go get public comments. It's going to be a 60-day public comment, so that's May through June.

So we would at least have the documents and give them time to tailor your presentation, and you're not dependent upon the Commission to validate

this unless we write a letter which says something to the contrary.

MEMBER BALLINGER: But it also gives us a chance to have our discussion, separate discussion.

MEMBER BLEY: I hope we have a discussion the first week of May.

MEMBER BALLINGER: But it could be a separate discussion, not a presentation.

CHAIRMAN BROWN: You mean the staff discussion as well? We ought to have an internal discussion. No, no, I think we can do that. It's a matter of -- we've got time to do it. There's only one letter right now. We'll put the letter off for this. It would be after the June meeting if we were going to do anything.

MEMBER RICCARDELLA: For those of you in the ACRS in the room, that transformation topic has been postponed until October, so we won't be spending a lot of time on that.

MEMBER BLEY: Then I guess what I did with my airplane will work just fine.

MEMBER BALLINGER: October of which year?

CHAIRMAN BROWN: Okay, let's finish. Dennis, do you have anything to add at the end here?

MEMBER BLEY: Nothing more to add. Thanks

for the whole day. I think it was very useful.

CHAIRMAN BROWN: Jose?

MEMBER MARCH-LEUBA: Yeah, I had not been able to prepare for this meeting the way I would like to, but I have a couple of concerns. Number one is what Peter was talking about. If a failure of the new control system produces a different type of transient, it should really trigger without having to elevate it to analysis.

And the second concern I have is that maybe the criteria, the screening criteria, we're setting it so high that we would only ask for LARs for things that we know we're not going to get because they do affect the safety of the reactor. So if it triggers the criteria, you're not even bothered to do it because you're not going to get it, so we are not going to get anything.

Maybe we're setting the criteria -- that's what I'm thinking right here. Maybe we're setting the criteria so high that it will only trigger when you shouldn't be doing it anyway, and think about it.

CHAIRMAN BROWN: Well, a new protection system or safeguard system to go all digital would obviously be an LAR and it would come in for full review, so.

MEMBER MARCH-LEUBA: And it would probably not be approved.

CHAIRMAN BROWN: I wouldn't say -- I disagree with that. We've approved -- they've approved several in the new plants, so there's no reason why it couldn't be, and Diablo Canyon was approved.

MEMBER MARCH-LEUBA: Yeah, but it would have to have --

(Simultaneous speaking.)

CHAIRMAN BROWN: Oconee has a new system, so.

MEMBER RICCARDELLA: It's just that it couldn't be done on the 50.59.

CHAIRMAN BROWN: It won't be a 50.59. It will be done as a --

MEMBER MARCH-LEUBA: I'm not sure that if you have a completely new digital protection system that is properly diverse, redundant, and with all of the bells and whistles that it would trigger the criteria.

MEMBER RICCARDELLA: There's a --

CHAIRMAN BROWN: An assessment.

MEMBER RICCARDELLA: Something that's done very early in the game that if it's a plant protection

system or any one of two or three categories --

CHAIRMAN BROWN: It's got to come in. That's already --

MEMBER RICCARDELLA: -- that automatically doesn't get a 50.59.

CHAIRMAN BROWN: They don't even have to go through the historic bands. They might try, but --

MR. LEBLOND: It would be L06 criteria.

MR. ARCHAMBO: Yeah, what happens with a protection system, for a digital protection system is the new ones have cross channel communications, and once you do cross channel communications, you've reduced independence, and once you've reduced independence --

(Simultaneous speaking.)

CHAIRMAN BROWN: Not supposed to be anywhere but in the voting units, so.

MR. GEIER: And it's acknowledged that it's going to require an LAR, and that's why ISG 6 was written and approved so that it streamlined the LAR process.

It actually helps the utilities have more certainty and predictability before they make the major investment and purchase the system. So that's, quite honestly, for fleets that want to go that way,

stations that want to go that way, they've got a path.

CHAIRMAN BROWN: We started that nine years ago.

MR. GEIER: And we know two to three fleets right now are considering initiating projects for that.

CHAIRMAN BROWN: Good, that's a good plan if it was through everybody else. Yeah, I just want to echo this was a very robust and animated discussion. I think it brought out a lot of good points. I may even have a halfway decent understanding if people expect me to write a letter on this at some point as long as the transcript is clear.

I would still encourage, once this thing is issued at you're out for public comment, you'd really save yourself a world of hurt if you could somehow get NRC on your side via some, you know, just absolutely irrefutable, as you would phrase it, thought processes in terms of how this should get applied.

I tried a little bit of thought process of why is CCF in this particular circumstance? Forget the bigger policy, but is there a bigger policy issue, and if there's examples where you can show where the bigger policy issue would be impacted by this decision

to not accept your words because they may have a more generic application.

Because that's the point is they have been dealing, the staff has been. They're focused on the digital I&C and not necessarily the whole 96.07 itself, and if this would impact that, then some examples of where that would happen based on this decision for Appendix D certainly ought to be brought out. You could help your case if you had some solid examples.

So, other than that, do you all have any other comments at this thing? I think I've done that before.

MS. WEAVER: I need to ask you.

CHAIRMAN BROWN: Yes?

MS. WEAVER: Just so I understand what the subcommittee wants to do, you want to defer the May meeting and have me set it up in June. Is that correct?

MEMBER RICCARDELLA: Yes.

CHAIRMAN BROWN: I'll look at the chairman here.

MEMBER RICCARDELLA: Yes, but then we do want to have some discussion among ourselves probably in closed session maybe.

MS. WEAVER: We can add it to the PMP if you would like.

MEMBER RICCARDELLA: PMP, yeah, add it to PMP.

CHAIRMAN BROWN: Or even -- yeah, it could be any time.

MS. WEAVER: Okay, and we have time to repost the May agenda. That's why I'm asking right now.

CHAIRMAN BROWN: Okay, yes, so we ought to delete that.

MEMBER BLEY: Kathy, that ought to be closed. It shouldn't be part of the public PMP.

MS. WEAVER: Okay.

MEMBER RICCARDELLA: And we can maybe close the PMP.

MEMBER MARCH-LEUBA: Also the agendas from June and July are getting very full with NuScale. You checked it?

MEMBER REMPE: But there is one letter in June. We checked.

MEMBER MARCH-LEUBA: Okay.

MEMBER REMPE: The rest of it's review info.

MEMBER MARCH-LEUBA: July is the one.

CHAIRMAN BROWN: Okay, and there --

MS. WEAVER: Okay, I'll put it in June and out of May.

CHAIRMAN BROWN: And a potential letter in June depending on how we decide. At least put it on the list so we can plan on it, and then we can make a decision.

MS. WEAVER: Okay, I will do that.

CHAIRMAN BROWN: Is that agreeable to the committee, subcommittee? Okay, with that in mind, has that answered your questions, Kathy?

MS. WEAVER: Yes, the staff knows.

CHAIRMAN BROWN: Okay, with that in mind, the meeting is adjourned. Thank you very much.

(Whereupon, the above-entitled matter went off the record at 3:43 p.m.)

NEI 96-07 Appendix D and RG 1.187 Revision 2

Chris Miller, NRR/DIRS Director
Michael Waters, NRR/DE/EICB
Tara Inverso, NRR/DIRS/IRGB
Philip McKenna, NRR/DIRS/IRGB
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Norbert Carte, NRR/DE/EICB
David Rahn, NRR/DE/EICB
David Beaulieu, NRR/DIRS/IRGB
Eric Martinez, RES/DE/ICEEB

Advisory Committee on Reactor Safeguards
DI&C Subcommittee Briefing
April 16, 2019

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Purpose

- Brief ACRS on NEI 96-07 Appendix D and Draft RG 1.187 Revision 2
- Brief ACRS on the process for evaluating and documenting digital instrumentation and controls (I&C) modifications using the 10 CFR 50.59 rule
  - Progress on Digital I&C Integrated Action Plan
  - Overview of 10 CFR 50.59
  - NEI 96-07, “Guidelines for 10 CFR 50.59 Implementation”: What it is and what it does
  - NEI 96-07 Appendix D, “Supplemental Guidance for Application of 10 CFR 50.59 to Digital Modifications:” Digital and Most Important Criteria
  - Draft RG 1.187 Revision 2, “Guidance for Implementation of 10 CFR 50.59, “Changes, Tests and Experiments:” Content and Exceptions
  - Started and planned modifications by industry using RIS 2002-22, Supplement One guidance

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Commission Direction on Digital I&C
(SRM-SECY-15-0106 & SRM-SECY-16-0070)

- Develop an integrated strategy to modernize the DI&C regulatory infrastructure
- Engage stakeholders to identify common priorities, problems, and potential solutions to address them
- Focus on acceptable approaches to comply with requirements
- Technology neutral focus; guidance can be tailored if necessary
- Evaluate potential policy issues

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IAP – Modernization Plans

- Modernization Plan (MP) #1 – Protection against Common Cause Failure
  - MP #1A – Regulatory Issue Summary (RIS) 2002-22, Supplement 1, "Clarification on Endorsement of NEI Guidance in Designing Digital Upgrades in Instrumentation and Control Systems"
  - MP #1B – Review of NEI 16-16 "Guidance for Addressing Digital Common Cause Failure"
  - MP #1C – Implementing Commission Policy on Protection against CCF in DI&C Systems
  - MP#1D – Update to BTP 7-19 for Diversity and Defense in Depth Against CCF
- MP #2 – Considering Digital Instrumentation & Controls in Accordance with 10 CFR 50.59
- MP #3 – Acceptance of Digital Equipment (Commercial Grade Dedication)
- MP #4 – Assessment for Modernization of the Instrumentation & Controls Regulatory Infrastructure
  - MP #4A – ISG-06 Revision
  - MP #4B – Broader Modernization Activities

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IAP Modernization Plan #2

- The Integrated Action Plan (IAP) established the following objectives:
  - Ensure there is adequate guidance within NEI 96-07 for 10 CFR 50.59 evaluations of digital I&C upgrades to:
    - Reduce licensee uncertainty
    - Clarify the regulatory process
  - Ensure common understanding for the use, interpretation, and application of guidance.
  - The following has been accomplished so far:
    - RIS 2002-22, Supplement 1 issued on 5/31/18
    - Public meetings to comment on NEI 96-07, Appendix D
    - Development of RG 1.187, Revision 2
    - Regional inspector training for Regions 1 and 4 in December 2018. Regions 2 and 3 will have training in June 2019

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NEI 96-07 Appendix D and RG 1.187 Revision 2

Overview of 10 CFR 50.59

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50.59 Rule History

- First promulgated in 1962 and modified in 1968.
- Allows licenses to make changes to the facility without prior NRC staff approval
  - Must maintain acceptable levels of safety as documented in the FSAR
- Rule was reviewed for revision in 1995; issued in 1999 which increased flexibility for licensees:
  - Now allows changes that only minimally increase the probability or consequences of accidents
  - Nov 2000: NRC issues RG 1.187
    - Endorses NEI 96-07, Rev.1, “Guidelines for 10 CFR 50.59 Implementation”

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NEI 96-07 and RG 1.187

- NEI 96-07 was originally as NSAC-125, but not endorsed by NRC
- NEI 96-07, Revision 1
  - Applicability
  - Screening
  - Evaluation Process
- Reg Guide 1.187
  - Endorses NEI 96-07, Revision 1 – “Provides methods that are acceptable to the NRC staff for complying with the provisions of 10 CFR 50.59”
  - Revision 1 to RG 1.187 will be issued based on San Onofre Generating Station (SONGS) lessons-learned. Clarifies 50.59 guidance on:
    - Departures from a method of evaluation
    - Accidents of a different type

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10 CFR 50.59 Relationship to Other Licensing Processes

- Amendments to the operating license (including technical specifications) are obtained under 10 CFR 50.90
- More specific regulations apply over 10 CFR 50.59 (e.g. quality assurance, security, emergency planning (EP) program changes under 10 CFR 50.54(a))
- Exemptions are processed IAW 10 CFR 50.12
- Maintenance activities are assessed and managed under 10 CFR 50.65
- License conditions (e.g. fire protection under GL 86-10) are controlled under the license condition and not 10 CFR 50.59

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50.59 Process Chart

NEI 96-07, Revision 1
November 2000

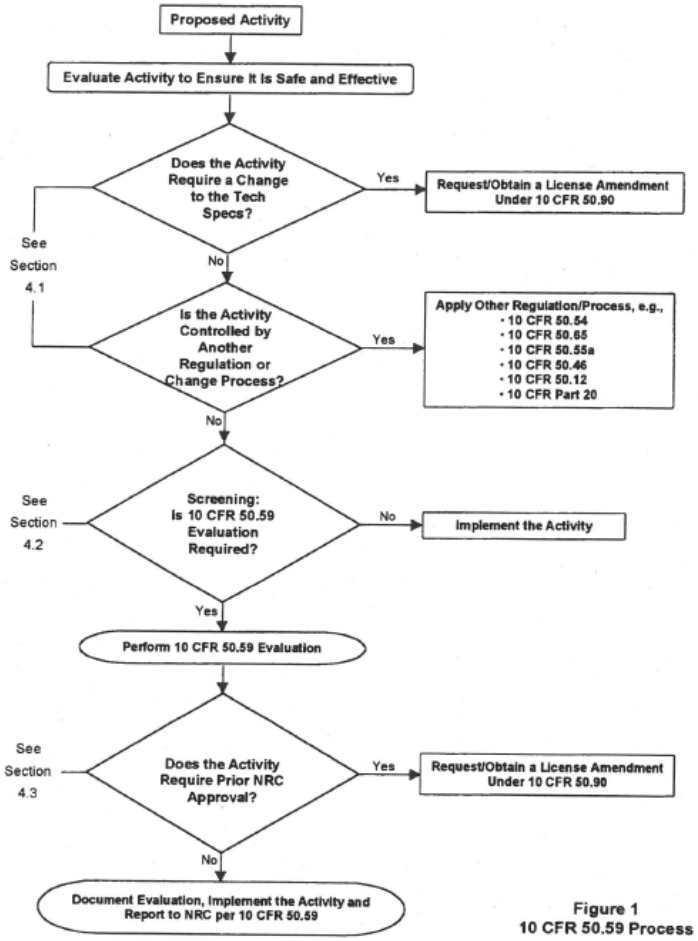

Figure 1
10 CFR 50.59 Process

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50.59 Evaluation Criteria

- A license may make changes in the facility as described in the FSAR (as updated), make changes in the procedures as described in the FSAR (as updated), and conduct tests and experiments in the FSAR (as updated) w/o obtaining a license amendment only if:
  - A change to Technical Specifications is not required
  - The change, test, or experiment does not meet any of the following criteria:
    - Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the FSAR (50.59(c)(2)(i))
    - Result in more than a minimal increase the likelihood of occurrence of malfunction of a structure, system, and component (SSC) important to safety previously evaluated in the FSAR (50.59(c)(2)(ii))

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50.59 Evaluation Criteria

- Result in more than a minimal increase in the consequences of an accident previously evaluated in the FSAR (50.59(c)(2)(iii))
- Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety accident previously evaluated in the FSAR (50.59(c)(2)(iv))
- Create the possibility of an accident of a different type than any previously evaluated in the FSAR (50.59(c)(2)(v))
- Create the possibility for a malfunction of an SSC with a different result than any previously evaluated in the FSAR (50.59(c)(2)(vi))
- Result in a design basis limit for a fission product barrier as described in the FSAR being exceeded or altered (50.59(c)(2)(vii))
- Result in a departure from a method of evaluation described in the FSAR used in evaluating the design basis or in the safety analysis (50.59(c)(2)(viii))

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NEI 96-07 Appendix D and RG 1.187 Revision 2

NEI 96-07, “Guidelines for 10 CFR 50.59 Implementation”

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NEI 96-07, Rev. 1

- Provides guidance for implementing the revised (as of 1999) 10 CFR 50.59 rule.
  - Definitions and applicability of terms for 10 CFR 50.59
  - Implementation guidance
    - Applicability
    - Screening (Adverse or Non-Adverse)
    - Evaluation Process
    - Applying 10 CFR 50.59 to Compensatory Actions to Address Nonconforming or Degraded Conditions
    - Disposition of 10 CFR 50.59 Evaluations
  - Documentation and Reporting

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Digital I&C 10 CFR 50.59 Guidance

- EPRI TR-102348
  - Issued in 1993 to establish guidelines for digital upgrades in the context of 10 CFR 50.59
  - Endorsed by NRC GL 95-02
    - "Use of NUMARC/EPRI Report TR-102348, 'Guideline on Licensing Digital Upgrades,' in Determining the Acceptability of Performing Analog-to-Digital Replacements under 10 CFR 50.59
- EPRI TR-102348, Rev. 1 issued to address revised 10 CFR 50.59 rule in 1999
  - Issued as NEI 01-01
  - Endorsed by NRC RIS 2002-22

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NEI 01-01

- Issued in March 2002 “to help nuclear plant operators implement and license digital upgrades in a consistent, comprehensive, and predictable manner”
  - Guidance for important steps in the design and implementation process to ensure digital upgrade issues are adequately addressed.
  - Guidance for performing the 10 CFR 50.59 evaluation for a digital modification
  - Guidance for a license amendment request

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NEI 01-01

- Industry inconsistently applying guidance in NEI 01-01 in digital upgrades
  - Lack of industry guidance on the technical evaluation of common cause failures
  - NRC Info Note 2010-10: "Implementation of a Digital Control System Under 10 CFR 50.59" (La Salle Rod Control Management System (RCMS) Modification)
  - Harris 2013 violation: SSPS control circuit boards replaced with digital complex programmable logic device (CPLD)-based boards
  - NRC Letter to NEI: "Summary of Concerns with NEI 01-01" dated 11/05/13 (ML13298A787)

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Concerns with NEI 01-01

- Definitions have changed
- Guidance documents have changed (e.g., ISGs)
- Operating experience (e.g., LaSalle, Harris)
- Statements in SE of NEI 01-01 not addressed
- Description of diversity and CCF
- Need to address Embedded Device RIS in examples
- NEI 01-01 not consistent with BTP 7-19 regarding eliminating consideration of CCF
- NEI 01-01 contains two types of guidance
  1. Guidance for digital modifications
  2. Guidance for implementing 50.59
- SECY 93-087 states that CCF should always be considered while NEI 01-01 does not
- Digital modifications to non-safety systems
- Characterization unanticipated behaviors of digital systems

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Digital I&C Mods

- What makes these different?
  - Common Cause Failure (CCF) (Due to combined functions, shared communications, shared resources, and software error in redundant channels)
- Safety model of nuclear plant
  - Defense in depth and redundant equipment
  - Hardware: Likelihood of CCF acceptably low
    - High quality standards in development and manufacture
    - Physical separation of redundant equipment
    - Degradation methods slow to develop (i.e. corrosion)
  - Software: Special cause of single failure vulnerability
    - Software resides in redundant channels of the system
    - Single undetected design error in software could lead to CCF in all redundant channels

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RIS 2002-22, Supplement 1

- NRC issues RIS 2002-22, Supplement 1 in May 2018 to clarify RIS 2002-22
- NRC continues to endorse NEI 01-01
- RIS 2002-22, Supplement 1, clarifies guidance for preparing and documenting "Qualitative Assessments"
- Not for Replacement of:
  - Reactor Protection System (wholesale)
  - Engineered Safety Features Actuation System (wholesale)
  - Modification/Replacement of the Internal Logic Portions of These Systems

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NEI 96-07 Appendix D and RG 1.187 Revision 2

NEI 96-07 Appendix D, "Supplemental Guidance for Application of 10 CFR 50.59 to Digital Modifications"

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NEI 96-07, Appendix D

- RIS 2002-22, Supplement One gives guidance on the technical aspect of digital I&C modifications, not the 50.59 process
- Appendix D gives digital I&C modification screening and evaluation guidance
- The format of Appendix D is aligned with NEI 96-07, Rev. 1 text for ease of use
- NEI 96-07, Appendix D does incorporate some RIS 2002-22, Supplement One guidance on qualitative assessments

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NEI 96-07, Appendix D

- From April 2016 through 2017, the NRC staff and industry participated in monthly public meetings to resolve NRC comments on draft NEI 96-07, Appendix D
- In December 2017, NEI and the NRC staff mutually agreed to place the review of NEI 96-07, Appendix D on hold to dedicate resources to the issuance of RIS 2002-22, Supplement 1
- RIS 2002-22 Supplement 1 was issued on 05/31/18
- In July 2018, NEI provided an update to NEI 96-07, Appendix D
- In August 2018, the NRC staff provided a set of comprehensive comments (85 total) to NEI, and began a disciplined process for cataloging and tracking comments for resolution
- Public meetings were held with industry on 8/30/18, 9/11/18, 10/11/18, and 11/14/18 to resolve these comments. Over 90% of the comments were resolved using this process
- NEI submitted its final revision of NEI 96-07, Appendix D to the NRC on 11/30/18 and the letter requesting endorsement on 1/08/19

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NEI 96-07, Appendix D Screening Section

- Scope of digital modifications:
  - Software-related activities
  - Hardware-related activities
  - Human-System Interface-related activities
- To reach screen conclusion of non-adverse:
  - Physical characteristics of the digital modification
    - Change has limited scope
    - Relatively simple digital architecture
    - Limited functionality
    - Can be comprehensively tested
  - Engineering Evaluation Assessments
    - Quality of the design process
    - Single failures encompassed by existing failures of the analog device
    - Has extensive operating history

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NEI 96-07, Appendix D Screening Section

- Combination of Components/Systems and/or Functions
  - Mere act of combining does not make the screen adverse
  - If it causes an adverse act on the design function, then adverse
  - Reductions in the redundancy, diversity, separation, or independence of a UFSAR design function screen adverse

- Human Factors Engineering Evaluation
  - NEI worked closely with NRC human factors personnel on this section
  - Two steps:
    - Identify generic primary tasks involved
    - For all primary tasks, assess if the mod negatively impacts the primary task

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NEI 96-07, Appendix D Evaluation Section

- Guidance in sections 4.3 aligns with main body of NEI 96-07 and there is a caution that Appendix D is intended to supplement guidance in main body of NEI 96-07
- Sections 4.3.1, 4.3.2, 4.3.5, and 4.3.6 (which align with the Criterion in the evaluation paragraph of 10 CFR 50.59) (50.59(c)(2)) discuss the use of the qualitative assessment outcome (sufficiently low or not sufficiently low) to answer the evaluation questions
- Sections 4.3.3 and 4.3.4 state that they provide no new guidance for digital modifications
  - More than a minimal increase in the consequences of an accident
  - More than a minimal increase in the consequences of a malfunction

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NEI 96-07, Appendix D Evaluation Section

- Guidance in section 4.3.6 (Does the Activity Create a Possibility for a Malfunction of an SSC Important to Safety with a Different Result):
  - Discussion on design basis functions
  - Connection between design basis functions and safety analysis result
- Overall perspective in section 4.3.6:
  - "Unless the equipment would fail in a way ***not already evaluated in the safety analysis***, there can be no malfunction of an SSC important to safety with a different results (***emphasis*** added)"

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NEI 96-07, Appendix D Evaluation Section

- Six Step Process in Section 4.3.6
  1. Identify the functions directly or indirectly related to the proposed modification
  2. Identify which of the functions from Step 1 are Design Functions and/or Design Basis Functions
  3. Determine if a new Failure Modes and Analysis (FMEA) needs to be generated
  4. Determine if each design bases function continues to be performed/satisfied
  5. **Identify all safety analyses involved**
  6. **For each safety analyses involved, compare the projected/postulated results with the previously evaluated results**

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NEI 96-07, Appendix D Evaluation Section

From step 5:

- "If there are no safety analyses involved, then there cannot be a change in the result of a safety analysis. Therefore, in this case, the proposed activity does NOT create the possibility for a malfunction of an SSC important to safety with a different result"

- NRC Staff disagrees in that 4.3.6 should determine the impact of the "SSC malfunction" instead of the impact on the results of the "safety analysis" on the facility as a whole

- Section 4.3.6 is inconsistent with NEI 96-07, Section 4.3.2 which states: "The safety analysis assumes certain design functions of SSCs in demonstrating the adequacy of design. Thus, certain design functions, while not specifically identified in the safety analysis, are credited in an indirect sense"

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NEI 96-07 Appendix D and RG 1.187 Revision 2

Draft RG 1.187 Revision 2, "Guidance for Implementation of 10 CFR 50.59, "changes, Test and Experiments"

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RG 1.187 Rev. 2

- Endorses NEI 96-07 Appendix D with exceptions
- Will be issued for public comment in same FRN that issues RG 1.187 Rev. 1 (Clarifications based on SONGS Lesson Learned)
- Exceptions:
  - States that NRC staff considers NEI 96-07, Appendix D, to be applicable to digital modifications only and not generically applicable to the 10 CFR 50.59 process
    - Basis: NEI 96-07, Rev. 1 base document provides guidance to the 10 CFR 50.59 process. This is a clarification

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RG 1.187 Rev. 2

- Exceptions (Con't):
  - Acknowledgement that Human System Interface (HSI) is now discussed in Appendix D whereas NEI 96-07 base document does not discuss HSI. The staff agrees that HSI may be screened
    - This is a clarification

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RG 1.187 Rev. 2

- Exceptions (Con't):
  - That examples in Appendix D are meant to illustrate guidance provided and should not be used to derive guidance
    - This is a clarification

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RG 1.187 Rev. 2

- Exceptions (Con't):
  - That NEI 01-01, Section 5, as clarified by RIS 2002-22 Supplement 1, is the only guidance the NRC has reviewed or endorsed as providing an acceptable technical basis to determine that the likelihood of software CCF is sufficiently low for the purpose of 10 CFR 50.59 evaluations
    - This is a clarification

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RG 1.187 Rev. 2

- Exceptions (Con't):
  - NEI has written Appendix D such that the determination of the impact is done against the safety analysis (which they attempt to redefine as only the accident analysis), whereas, the staff's position is that the results of any malfunction previously evaluated in the UFSAR must be compared. By following the guidance as written, the staff believes that licensees can arrive at different conclusions in evaluations against 10 CFR 50.59(c)(2)(vi).
    - NRC interpretation of the rule

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RG 1.187 Rev. 2

- Exceptions (Con't):
  - Examples 4-17 through 4-23 of NEI 96-07, Appendix D, use the evaluation criteria in section 4.3.6 of NEI 96-07, Appendix D, and it is possible to obtain a different result using this criteria
    - From Example 4-19 of NEI 96-07, Appendix D:
      - "Although the software CCF likelihood was determined to be not sufficiently low, there are no safety analyses that directly or indirectly credited the design basis function or contain expected responses of the radiation monitors. Thus there cannot be a different result when comparing to a pre-existing safety analysis since none exists"

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RIS 2002-22 Supplement One

The following discussion will involve qualitative assessment information from RIS 2002-22 Supplement One

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Qualitative Assessment

- Originally discussed in NEI 01-01 (Section 4&5 and Appendices A&B), but limited guidance on how to accomplish
- RIS 2002-22, Supplement 1
  - Evaluate the likelihood of failure of a proposed digital mod to accomplish designated safety function
  - Evaluate the likelihood of common cause failure
- Used to support a conclusion that a proposed digital I&C modification will not result in more than a minimal increase in:
  - The frequency of occurrence of accidents (50.59(c)(2)(i))
  - The likelihood of occurrence of malfunctions (50.59(c)(2)(ii))
  - Create the possibility of an accident of a different type (50.59(c)(2)(v))
  - Create the possibility for a malfunction of an SSC with a different result (50.59(c)(2)(vi))

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Qualitative Assessment Factors

- Design Attributes
  - Can prevent or limit failures from occurring
  - Focus primarily on built-in features:
    - Fault detection
    - Failure management schemes
    - Internal redundancy
    - Diagnostics within the integrated software and hardware architecture
  - Can be external:
    - For example: Mechanical stops or speed limiters

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Qualitative Assessment Factors

- Typical Design Attributes
  - Watchdog timers that function independent of software
  - Self-testing and diagnostics capabilities
  - Use of highly testable devices (i.e. breakers, relays)
  - Elimination of concurrent triggers
  - Segmentation
  - Redundant networks
  - Unidirectional communications
  - Network switches with traffic control
  - Use of redundant controllers, I/O, power sources, etc.
  - Internal or external diversity
  - Use of isolation devices
  - Extensive testing

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Qualitative Assessment Factors

- Quality of the Design Process
  - Software development
  - Hardware and software integration processes
  - System design
  - Validation and testing processes
- For Safety Related:
  - Development process is documented and available for referencing in the qualitative assessment
- Commercial grade:
  - Documentation may not be extensive
  - Qualitative assessment may place greater emphasis on design attributes and OE

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NEI 96-07 Appendix D and RG 1.187 Revision 2

Started and Planned Modifications by Industry using RIS 2002-22, Supplement One

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Digital I&C Mods

- The following Digital I&C Mods are either started or planned based because of RIS 2002-22, Supplement One Issuance:
  - 3 safety-related digital mods started in 2018 and planned to be complete in 2019:
    - Diesel Generator Controls
    - Digital Breakers
    - Chiller Controls
  - 8 safety-related mods planned to start in 2019 and completion in 2020, 2021, and 2022
    - RWCU Instrumentation
    - Chiller Controls
    - EDG Sequencer
    - Digital Inverters
    - Control Room HVAC Controls
    - Low Voltage MCC Breakers
    - Radiation Monitoring System (2 mods)

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Digital I&C Mods

- Planned Digital I&C Modifications (Cont'd)

- 3 safety-related digital mods with a start date TBD
  - HPCI/RCIC Speed Control
  - Single Loop Controllers (AFW, HPCI, RCIC)
  - Incore TS and RVLIS Upgrade

- 6 non-safety related mods started in 2018 and 2019
  - Turbine Controls
  - Plant Computer System
  - Feedwater Control
  - Fuel Handling
  - Rod Control (2 mods)

NEI 96-07
Appendix D

April 16, 2019

NUCLEAR ENERGY INSTITUTE

NEI 96-07 Appendix D – Benefit to Industry

With current guidance, licensees have difficulty…	Appendix D…
Identifying pertinent UFSAR-described design functions and descriptions affected by digital activities	Guides the 50.59 practitioner on identification of UFSAR-described design functions relative to digital activities
Determining if a digital change is adverse to a design function or method of performing or controlling a design function	Provides specific screening guidance for digital activities, including comprehensive Human-System Interface guidance
Deciding how and where to address CCF, including software CCF, in the 50.59 review process	Guides the 50.59 practitioner on how and where to address CCF in the 50.59 review process and how to apply CCF assessments to justify conclusions

Appendix D is "supplemental" guidance to be used with NEI 96-07, Rev. 1

NEI 96-07 Appendix D – Benefit to Industry

With existing guidance, licensees have difficulty…	Appendix D…
Addressing Evaluation Criteria 1, 2, 5, and 6 as they apply to digital activities	Provides specific digital activity-based guidance and examples on application of 50.59 Criteria 1, 2, 5, and 6
Recognizing the plant licensing bases impact when combining previously separate design functions	Provides detailed guidance and examples on the combination of design functions
Identifying malfunction results when addressing Evaluation Criterion 6	Provides detailed guidance on how to identify malfunction results even when challenged with UFSARs of varying levels of detail and descriptive material

For digital activities, Criterion 6 has been the most difficult to address

Criterion 6 – Four Major Points

1. NEI 96-07, Definition 3.9, “malfunction of an SSC important to safety” is used within Section 4.3.6 of Appendix D consistently
2. The rulemaking record is clear – the rule’s intent when looking for “different result” is the **safety analyses**, not the descriptive material
3. Consistent with NEI 96-07, Rev. 1, Section 4.3.6 of Appendix D avoids uneven application of 10 CFR 50.59
4. Section 4.3.6 of Appendix D is consistent with the other 10 CFR 50.59 Evaluation criteria

Point 1 – A "Malfunction" is Defined

A "malfunction" is a failure to perform a Design Function

A Design Function is either:
- A Design Basis Function
- Supports or impacts a Design Basis Function
- Accident/transient initiator

A Design Basis Function is either:
- Required by regulations, license conditions, orders, or TS
- Credited in the safety analysis

App B to NEI 97-04 (endorsed by RG 1.186) states that Design Basis Functions are:
- Derived primarily from the GDCs
- Functionally far above individual SSC functions
- Safety Analyses provide context

All of the information on this slide is found in approved regulatory guidance or the regulation itself.

In every instance, the Evaluation begins at the lower SSC level and assesses the impact at the safety analysis level.
(e.g., D/G jacket water level → D/G)

Point 2 – Rulemaking Record Refers to Safety Analysis Level for "Different Result"

From the Notice of Proposed Rulemaking for the current regulation:

"The final change is being proposed in response to the comments on the staff proposed guidance (NUREG–1606) on the interpretation of malfunction (of equipment important to safety) of a different type…"

"However, the Commission recognizes that in its reviews, equipment malfunctions are generally postulated as potential single failures to evaluate plant performance; thus, the focus of the NRC review was on the result, rather than the cause/type of malfunction. Unless the equipment would fail in a way not already evaluated in the safety analysis, there is no need for NRC review of the change that led to the new type of malfunction. Therefore, as the third change in § 50.59(a)(2)(ii), the Commission is proposing to change the phrase "of a different type" to "with a different result."

"different result" with respect to safety analyses - the focus since 1999

Point 2 – Rulemaking Record Refers to Safety Analysis Level for "Different Result"

Proposed rule discusses earlier GL 95-02 guidance generated for applying the pre-1999 rule language of "type"

"The staff has provided guidance on this issue in Generic Letter (GL) 95–02, concerning replacement of analog systems with digital instrumentation."

"The GL states that in considering whether **new types** of failures are created, this must be done at the level of equipment being replaced—not at the overall system level. Further, it is not sufficient for a licensee to state that since failure of a system or train was postulated in the SAR, any other equipment failure is bounded by this assumption, **unless there is some assurance that the mode of failure can be detected and that there are no consequential effects (electrical interference, materials interactions, etc.), such that it can be reasonably concluded that the SAR analysis was truly bounding and applicable**."

Guidance generated for where to apply "result" in the revised rule

Point 3 – Avoid Uneven Application of 10 CFR 50.59

From SECY 97-035:

"Plant SARs vary in depth and completeness. In general, the level of detail of information contained in an SAR for later facility applications was much greater than that for the earlier licensed plants. Thus, **tying the scope of 10 CFR 50.59 to the SAR results in uneven application of 10 CFR 50.59**."

- The solution in the current rule was to focus on "Design Functions" and not the descriptive material contained in the UFSAR
- Since individual sites have varying degrees of UFSAR descriptive material, this is necessary to avoid having the same change treated differently
- App B to NEI 97-04 (endorsed by RG 1.186) provides guidance that the response to an individual SSC's failure is part of the descriptive material and not part of the safety analysis

Point 4 – Section 4.3.6 Consistent With Other Criteria

- **10 CFR 50.59 c(2) iii states:**

  "…accident previously evaluated in the final safety analysis report (as updated)"

- **10 CFR 50.59 c(2) iv states:**

  "…malfunction of an SSC important to safety previously evaluated in the final safety analysis report (as updated)"

- **10 CFR 50.59 c(2) vii states:**

  "…as described in the FSAR (as updated) being exceeded or altered"

- Criteria 3, 4, and 7 all rely solely on the results of safety analyses

- **The guidance contained in NEI 96-07 is endorsed in Regulatory Guide 1.187 and is an approved way to meet the 10 CFR 50.59 rule**

Summary

- Section 4.3.6 of NEI 96-07, Appendix D, utilizes previously approved definitions from NEI 96-07, Revision 1
- Section 4.3.6 of NEI 96-07, Appendix D relies on the 1999 rulemaking record to understand “different result”
  - The rulemaking record establishes that “[u]nless the equipment would fail in a way not already evaluated in the safety analysis, there is no need for NRC review of the change that led to the new type of malfunction.”
- Reliance on safety analysis results versus descriptive material avoids repeating the problem of “uneven application”
- The logic and treatment of Section 4.3.6 of NEI 96-07, Appendix D, is consistent with the application of other 10 CFR 50.59 Evaluation criteria.