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# NUCLEAR REGULATORY COMMISSION

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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MODERNIZATION PLAN #3 WORKING GROUP

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PUBLIC MEETING ON MODERNIZATION PLAN #3: COMMERCIAL GRADE DEDICATION OF DIGITAL EQUIPMENT

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THURSDAY,

NOVEMBER 3, 2016

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ROCKVILLE, MARYLAND

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The Working Group met at the Nuclear Regulatory Commission, Two White Flint North, Room T-6A1, 11545 Rockville Pike, at 1:35 p.m., Carolyn Lauron, Project Manager, presiding.

WORKING GROUP MEMBERS:

CAROLYN LAURON, NRO/DEIA/NRGB, Project Manager

JONATHAN ORTEGA-LUCIANO, NRO/DCIP/QVIB3, on behalf of Paul Prescott

DINESH TANEJA, NRO/DEIA/EICB

DANIEL WARNER, NRR/DE/EICB

YAGUANG YANG, RES/DE/ICEEB

ALSO PRESENT:

AARON ARMSTRONG, NRC

DAVID CURTIS, NRC

ASHLEY FERGUSON, NRC

WESLEY FREWIN, NextEra Energy*

ISMAEL GARCIA, NRC

STEPHEN GEIER, NEI

MATT GIBSON, EPRI*

DAVE HOOTEN, Altran*

DEAN MUNDY, NEI

MARC NICHOL, NEI*

WARREN ODESS-GILLETT, Westinghouse*

DAVID RAHN, NRC

JASON REMER, NEI*

MARK BURZYNSKI, RadICS*

ED RENAUD, Westinghouse*

* Present via telephone

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P R O C E E D I N G S

(1:35 p.m.)

MS. LAURON: I'd like to welcome everybody to this public meeting to discuss the purpose and scope of Modernization Plan #3 on commercial grade dedication of digital equipment. I'm Carolyn Lauron. I'm the project manager for this activity.

Before we have opening remarks, we ask that all present fill out the sign-in sheet and also silence your cell phones.

This is a Category 2 public meeting and the public will have an opportunity to ask questions and provide comments at the end of the business portion of the meeting.

The bridge line operator, Angela, will be able to assist us in opening the lines individually.

All presentation materials are found on the NRC public meeting website under the notice for this meeting. There's a section --

MR. REMER: Jason here.

MR. MUNDY: That's Jason. Thanks, Jason.

MR. REMER: Sorry.

MS. LAURON: That's all right. There's a section in the meeting notice called related documents and the second item listed has the web link to the staff's presentation. There is also a third item listed in that section with the industry presentation. Please note that industry will be focusing on Attachment 2, Appendix C entitled "Digital Device Procurement."

We have several presenters calling into the meeting. Once we've completed introductions in the room, we will ask those on the bridge line to introduce themselves and identify their affiliation.

The meeting is being transcribed and a transcript, along with a summary, will be posted on the NRC public meeting website under the notice for this meeting.

For those in the room in the event of emergency, please calmly follow the NRC staff to the nearest exit and remain with us at the assembly area.

And now I'd like to open it up to David Curtis for opening remarks.

MR. CURTIS: Good afternoon. So my name

is David Curtis. I'm the chief of the Instrumentation, Controls, and Electronics Engineering Branch in the Office of New Reactors here at NRC.

Just a couple of things I wanted to start off with. So we're excited to be starting launching our third Modernization Plan Strategy with industry. So I had the good fortune to actually be the primary author on this commercial grade dedication item in the original Modernization Plan. I don't think it's something that we've ever really discussed with industry.

We received some input prior to the last draft that went forward and we understood that input very well. We made a conscious decision that looked like a narrowing of scope, but that was not actually the long-term intent. At the time, we had some open questions which we'll be discussing a little bit today and I'm sure more as we move forward as to why we made the decision to narrow it within the actual plan itself because we had some questions ourselves about sort of what we can and can't do. We don't really know the complete answer to yet. So I just wanted to sort of address that up front that we're open to wherever you want to go to it, we want to understand all of your sort of input and sort of move on from there. So thank you

very much.

MR. MUNDY: Well, thank you for that background in the introduction. That's very helpful.

MS. LAURON: If anybody would like to open it?

MR. MUNDY: Yes, this Dean Mundy, I'll just do a very quick introduction. The previous introduction was absolutely correct. We haven't had much opportunity to discuss this topic by virtue of its number, the number being 3. It's behind 1 and 2 which are consuming mass quantities of other talent. So we're happy to be starting this one as well.

It would be interesting to see how this goes and we consciously chose to not provide additional input given that we haven't had a real chance to discuss the prior input and thought that that made the most sense, rather than complicate things with more or potentially different input. Frankly, we don't have any, our cards are on the table. We did intend to discuss what was added before and we're glad to see MP #3 as it was written, narrowing a side if that's a perception at all.

With that, I will ask Jason Remer of NEI if he's got any other opening remarks and then I'll just mention who may be talking from industry's perspective.

Jason?

MR. REMER: Yes. Dean, thank you very much. Yes, we're excited about working with NRC on this very important area and even as we had our meeting yesterday on Appendix D for 50.59, it became obvious that this area of commercial grade dedication is actually getting more and more critical as the day goes by. So we look forward to working with the NRC on this and improving efficiency and making sure we operate these plants safely and efficiently. So thanks very much. I'll be listening on the line here.

MR. MUNDY: Thanks, Jason. I guess one more comment and I'll probably go more silent than anything else. The other folks on the phone, I mean in addition to Steve and I here from NEI, there's some other industry folks that were part of our April 22nd submittal and hence on the phone to help explain it in detail include Dave Hooten, Matt Gibson, Marc Nichol from NEI and Warren Odess-Gillett. And Ron Jarrett from TVA was intending to dial in, but he got called away and is unfortunately in the air at the moment, so he's got a pretty good excuse I suppose. Wes Frewin from NextEra may be dialing in. I'm not sure, he may be on the phone already.

And if you are, Wes, and you can hear this, I did send you the leader, our speaker codes so you could use that to dial in and participate before the public section.

MR. FREWIN: Yes, I'm on the call, Dean.

MR. MUNDY: Oh, thank you, Wes. I appreciate it. So that's who we can expect to contribute from NEI when we get to our section. And Dave Hooten will be helping to walk us through what was referred to as Appendix Charlie.

Back to you, Dinesh.

MR. TANEJA: Well, you know, I'm glad that we were able to at least hold on the schedule. We've been trying to get together for the last couple of months and Dean, you're right. The MP #1 and MP #2 have been consuming most of our time and efforts here so you know.

So you know, I'm Dinesh Taneja. I'm in the Office of New Reactors and I'm one of the senior I&C engineers and have considerable amount of industry experience. I've been in the nuclear industry since 1980 and so I've worked in Operating Reactors, New Reactors, and so hopefully, I think I'll be able to contribute somewhat to this project. And I have a good number of good people that are working with me in the

NRC Working Group and we'll get a good participation from them.

MR. ORTEGA-LUCIANO: Hello, my name is Jonathan Ortega. I'm also from the Office of New Reactors. I work for the Quality Assurance and Vendor Inspection Branch. I'm here on behalf of Paul Prescott, well, he's sick today, so I was called in. And also, I'm the person in charge of the review of DG-1292.

MR. YANG: My name is Yaguang Yang. I'm with Research here. I've been here for about ten years. Before I came to NRC I was a control systems engineer for aerospace systems.

MR. ARMSTRONG: My name is Aaron Armstrong. I'm also in NRO. I'm in the Quality Assurance Vendor Inspection Branch as well.

MR. CURTIS: To repeat, my name is David Curtis. I'm the Chief of Instrumentation Controls in Office of New Reactors.

MR. WARNER: My name is Dan Warner. I'm in NRR in the I&C Branch.

MR. RAHN: And this David Rahn. I'm also in NRR in the I&C Branch.

MS. BERGMAN: Oh, sorry. Jana Bergman,

Curtiss-Wright.

MR. MUNDY: Dean Mundy, NEI.

MR. GEIER: Steve Geier with NEI.

MS. LAURON: Angela, could we open up the lines for the other speakers? Thank you.

MR. REMER: Jason Remer, NEI.

MR. FREWIN: Wes Frewin, NextEra Energy.

MR. HOOTEN: Dave Hooten, Altran.

MR. GIBSON: Matt Gibson.

MS. LAURON: Yes, Matt Gibson from EPRI.

MR. MUNDY: I think there were two more. Mark Nichol from NEI, also on as a speaker. And I believe Warren Odess-Gillett from Westinghouse.

MS. LAURON: Warren, are you on the line?

MR. ODESS-GILLETT: Yes, I am.

MS. LAURON: Okay, great. Thank you.

MR. MUNDY: I think that's it.

MR. TANEJA: All right, we'll have the next slide to see what we have, if there's something to guide us through the meeting.

It's a quick two-hour meeting and the basic agenda, what we want to do is stick to what we had in our -- in the MP #3 commercial grade dedication of diesel equipment action, our integrated action plan. So we'll

just kind of follow what, you know, the plan was and see where we are.

One of the items on the plan was to work on the reg guide on commercial grade dedication which is issued as a Draft Guide-1292. So go over the status of that and then we'll discuss what is really the intent and purpose and get a common understanding between the industry and the NRC as to what we want to do under this Modernization Plan #3.

And then we'll hear what the industry's perspectives were on that one and then go ahead and kind of come up with a prioritization and a schedule of activities, how we want to proceed further on this test.

Next slide, please.

Okay, the NRC team, I'm going to be leading the working group on this Modernization Plan from the NRC side and I have Dan Warner from NRR, Operating Reactors. He's part of the team. He's from the I&C Branch. And Paul Prescott is from our Quality and Vendor Inspection Branch. Paul could not be here today, so we have Jonathan, you know, representing him and Yaguang Yang, he's from our Office of Research and he's also part of our team. And Carolyn is going to be helping us with project management activities.

Next slide, please.

I'm going to have Jonathan cover where we are on the Draft Guide-1292. It's all yours.

MR. ORTEGA-LUCIANO: We submitted the reg guide for public comments back in -- last summer. And the comment period ended in September 2016. We received nine letters submitting public comments. Most of them can be grouped together because it was a big effort from NEI to put a table together for comments and there were several licensees and stakeholders that basically agree and concur with that table of comments. So most of them are basically asking for corrections and clarification and the vast majority of the comments are in regard with the regulatory position, number one, which has to do with the digital I&C EPRI documents that we endorsed two of them. And most of the comments people are asking basically the status of the other four documents and what are we going to do about it?

So I'm going through the comments right now. I'm consolidating all of the comments and I don't see any problems dispositioning any of the comments that we submitted. There's no show stoppers. Once we compile the comments and disposition of them accordingly, I will submit a proposed final draft guide

to Research which it will go into the regulatory guide process.

And we are anticipating that we can issue the final draft reg guide sometime in April 2017 and the reason being is because once Research completes the final draft, it will go through concurrence, public comments, EPRI comments and then ACRS will have a shot if they want to comment on that one, so usually they provide almost a month and month and a half to each of those steps for comment period. So that will drive us basically to April 2017.

MR. TANEJA: Jonathan, I heard from one of the persons that they were wondering if they get to get the resolution of the comments? They get published, right, the resolution of the comments?

MR. ORTEGA-LUCIANO: Yes. They -- Research will compile in order of the comments and correspondence that were generated as part of the whole process and then that will be put in a packet in ADAMS which will be publicly available along with the incoming letters on all these positions.

MR. GEIER: If I could just ask a question, just the schedule-wise for that schedule includes taking the package to ACRS in the review, so

in April 2017 when they issue the draft reg guide, it will have gone through that process.

MR. ORTEGA-LUCIANO: Yes, the 2017, it went through the whole process, nothing is holding the document. I mean it will be final on the website.

MR. GEIER: Okay. And when do you think you'll have the package with the comment resolution ready for -- available?

MR. ORTEGA-LUCIANO: I'm working on them right now and I just received one more letter yesterday, even though the comment period closed on September 6th. So I'm going to consolidate all of them because they are very similar and I want to make sure once they consolidate those I will talk to this group to make sure that we are on the same page because most of the comments cover some of the efforts being done in this group for the I&C. So we don't want to say something that will go against the group effort what they're doing right now.

I will try to have these comments in a table format and this position in the next three weeks and then I will submit it to Research.

MR. GEIER: Okay.

MR. ORTEGA-LUCIANO: For the process.

MR. GEIER: Yes, I think the consolidated approach will work. Mark Nichol can chime in on this, but we both worked with his team which are the Supply Chain Branch, but then we also provided input from the Digital Group so that when it got submitted it basically came from both efforts within NEI.

MR. ORTEGA-LUCIANO: I think what is happening because it was a nice table that was put together by NEI. These are public letters. I think some licensee stakeholders are reading them and they just send me a letter "we concur with that and this needs an additional sentence." So that's basically what I got addressed to me. I got another letter from a licensee saying "I agree with NEI completely, plus this sentence we would like you to take under consideration."

Since last week, we mentioned the status of DG-1292, so it doesn't surprise me that somebody went and looked for the comments and then evaluated and said oh, I also agree with this comment. But we don't anticipate to get any comment comments. So hopefully, the next three weeks we can finalize the disposition of all of them and submit them to Research.

MR. MUNDY: And when would industry see those consolidated responses? Would that not be until

the draft in April or would there be some feedback before then?

MR. ORTEGA-LUCIANO: I'm not sure at what stage in the process once -- because as I go along doing all of this, Chris was compiling the entire folder and I don't know when Research will release the consolidation of the comments. I can find out better and get back to Dinesh on that because it's like a formal process.

MR. MUNDY: Sure.

MR. ORTEGA-LUCIANO: They have like time slots for all these different stages and I can find out from Research and give an idea of maybe when in the process they may release the disposition of the comments.

MR. TANEJA: The Office of Research is the responsible office that issues the regulatory guides, so they hold the process.

Any other questions or comments on the Draft Guide-1292? Anybody on the phone? Okay.

We are going to see, I guess, what we put into MP #3. The Modernization Plan #3, commercial grade dedication of digital equipment, it was basically a result of our interaction with the industry prior to

issuance of the integrated action plan which was issued May 31st. And prior to that, I believe it was the end of March is when we had issued a draft for public comments or industry comments I would say. And one of the things that came out of that was to kind of put the commercial grade dedication at a higher priority than some of these other activities and that's how this project ended up being on somewhat on top of the list, named project. So that's how it came about.

So we took all the information that was presented to us, including the Appendix C that we got from NEI on the digital device procurement. And at that time I guess we were trying to meet the date of May 31st to get the integrated action plan issued. So there was some legal questions that were raised on one of the concepts that was discussed about third-party certification, whether that is legally allowed within the regulations or not. So not having answered that question, we put together this write up. And David, you know, is a primary author of this.

MR. CURTIS: Well, I will say one other thing, too.

MR. TANEJA: Yes.

MR. CURTIS: We spent probably not that

many minutes total, but it seemed to me like an inordinate amount of time on the word of equipment. That was where we ended up with. It was meant to encompass many things. We struggled around what word to use and that was what we ended up with. So the only thing I would say is don't read too much into that word.

MR. GEIER: Use items or --

MR. CURTIS: I think that was one of the words that was considered.

MR. GEIER: And I guess a little background from our standpoint. When we put together a response team which I think was a March 30th draft and so we decided we needed to kind of give some really detailed input. Put together a team and I think you originally had a list of nine different areas kind of prioritized. We took those nine and we tried to say okay, it's kind of hard to say nine priorities. Let's try to take the top three or four and kind of focus and you can combine some things we thought that made sense. So one of the things we were kind of fresh off some public meetings and discussion related to embedded digital devices. And we knew there was a strong theme within that. A lot of these embedded digital devices and a RIS they got issued around issued around this same time.

MR. CURTIS: Right.

MR. GEIER: A lot of those come in through commercial products, equipment items, devices. So we thought that reading that RIS and some of the public discussion was that commercial grade dedication, that's where you're going to catch that. That's where you're going to help address that. So we thought it made sense to combine those.

MR. RAHN: We agree.

MR. GEIER: And then this idea of using some of the certification processes that are out there, obviously that would be a strong desire, because it really streamlines things and takes credit for activities that are already being performed to provide a higher confidence. When we bring it to Bison, it was manufactured in a commercial program and then used as a safety-related application, that it will then -- you know, we've got high confidence on its reliability and ability to perform the safety functions. So that's kind of some background of why we arrived at this and kind of put this together in terms of the top three.

MR. TANEJA: So we really basically ended up with two primary activities that deal with commercial grade dedication and digital equipment. One was -- we

have, I guess, endorsed EPRI standards on commercial grade dedication of PLCs and computer-based systems, but those were done or issued back in early 1990s?

MR. GEIER: Early to mid.

MR. TANEJA: Early to mid, that time frame. And the way I guess we endorsed them, we did an SER on them and really did not do any kind of reg guide, but that's the going-in practice right now and actually it was practiced on a number of different -- Triconex was one of the products that followed that process. Common Queue was the other product that followed that process. I'm talking about early on. And even at that time I think there was some single-loop controllers and some smart transmitters. There were some examples back then that the industry and the NRC worked on exercising that commercial grade dedication methodology, right?

Now the regulation that it falls under is Part 21 which basically says that a basic item can either be produced under Appendix B process or it can be by dedication, as long as the dedicating entity is an Appendix B entity, whether it is the licensee themselves or their suppliers. And then they have these specific things that they do to dedicate, identifying the critical characteristics and then verifying those

characteristics using some software means, whether it's by evaluation, examination, supplemental testing, you know, and that type of methods.

So these EPRI standards actually were developed very specific to the technology at the time. So when they laid out all the critical characteristics, they laid out the critical -- for the PLCs. I don't know if we are sticking with PLCs any more. We are way beyond. When we are talking about these embedded devices, and we are talking about these other digital or programmable devices, whatever I want to call them, are the single use devices. One of the examples that we've been using is chillers, for example. The chiller controls is probably a very standard off-the-shelf item that a chiller manufacturer buys from a third party or a fourth party, wherever their suppliers are. And then they -- the chiller as a whole is dedicated, but then the identification of critical characteristics and how they're verified, I don't know if you have any known guidance that's out there right now. I think it may be ad hoc right now how these things are being done or we're using these EPRI guidelines that are out there and trying to horse whip them into doing the work that we need to do today.

So we felt that one of the activities probably is to see if we can enhance that guidance that needs to be done. And the draft guide that we issued it excluded the digital items right now. And I think there were -- in Section 14.1 of this EPRI report, identified six or four standards.

MR. RAHN: Six.

MR. TANEJA: Six standards, right? So two of them we have already endorsed, but then they have some supplemental information in there.

I believe one other thing we should do is probably evaluate those and I think the right way to do would be this new reg guide is going to be issued by spring of next year. And we could probably divide that or supplement that reg guide with these additional digital items. Because that reg guide is a -- I would say it applies to everything. It's commercial grade dedication of commercial items. Now whether that's nuts, bolts, valve fittings, right?

MR. ORTEGA-LUCIANO: Basically provides what you have in your program in order to dedicate. You will supplement it with more guidance depending on the complexity of what you're trying to dedicate. So it's basically the how to develop the program, to start the

dedication process. And depending on the complexity, then you supplement with some of this guidance on our EPRI guidelines and across the entire document.

MR. TANEJA: So what I want to bring out is that we know of these EPRI guidelines, but apparently, there's some other work that's being done in the area as well out there and I think -- was Ismael going to join us?

MR. CURTIS: He's on the line I think.

MR. TANEJA: Ismael?

MR. CURTIS: But I don't think he can -- he's not one of the --

MR. TANEJA: Okay. So I guess, so we have our senior level advisor on this whole area. So he comes to us from Naval reactors. And he's got some knowledge of how and what they have done with their suppliers.

MR. ORTEGA-LUCIANO: Ismael Garcia?

MR. TANEJA: Garcia, right. So you know, he's got some information that we should look into which is really outside of the commercial nuclear industry, right, on how the dedication is done.

And also David, does IEC have something on this area?

MR. RAHN: I think we've heard about something being developed. I don't know if it's out.

MR. TANEJA: Right. And you compiled a bunch of information on what's available right now.

MR. YANG: Yes, yes. First, I think that the Appendix C says that once we endorse the new documentation and then we don't need to use the two old ones, the documentation for old ones. But the new documentation for digital I&C just has two pages. The new one we're endorsing just has two pages, Chapter 14 for digital I&C. These two pages, basically is just based on six documentations.

MR. GEIER: So that's the EPRI guidelines?

MR. YANG: These are the EPRI guidelines, the next one we're going to endorse right now.

MR. GEIER: I see.

MR. MUNDY: Knowing that portion of it.

MR. YANG: So it just has two pages about digital I&C. Two of them were endorsed in 1997. One is about PLC, now we mostly use FPGA instead of PLC. Otherwise, for digital equipment, I read this too, for digital equipment I think that mostly addresses software side. It didn't mention anything about hardware.

In operational experience we saw from LER they have quite some instances happen because the equipment was too old. It was in storage for like 20 years, 70 years, and it failed because of aging problems. The other one, I think that we need to add a little bit more when we go ahead with that. That's one thing.

Another is for FPGA, I think IAEA has the documentation, a standard talking about how FPGA should be qualified to use the safety systems. I'm not sure if NRC should look at that documentation. I think I have the --

MR. TANEJA: Yes, so I think the point being that this activity of evaluating additional commercial grade dedication guidance and standards that are out there already so the task and my thinking that the NRC, we want to pursue evaluation of these standards and guidance documents and then look at the way of endorsing them whether it be by reg guide or -- preferably by that means.

MR. MUNDY: Sure.

MR. TANEJA: And so that was one item that we identified in our MP #3 activities. Now what that does is you know, that provides the known guidance that

the industry can use on dedicating digital components or equipment or whatever you want to call them or digital items.

And then the other item that was identified by your comments on that was investigate methods of using a third party that can certify a component and then the component can be used in the plant without going through the dedication process.

Now I am familiar personally with some of the items that are already done in other industries, but I think one of the questions that came up when we were trying to write this plan was that legally, can the NRC allow the entity to issue a certificate, a third-party entity to issue a certificate on a device or a component which can be used in a nuclear power plant?

So we have to answer that question before we start going further down the path of looking into this activity. Yes, I mean one of the examples that I think of when it comes to that is that we've allowed ASME to issue N stamps for using that process and we do allow that, but we don't have any precedent beyond that. So that's something that legally I need to explore that to see. So from the NRC point of view, I think we do need to explore that legal position first.

MR. RAHN: One possibility could be that you could still do a commercial grade dedication process and farm out a piece of that process to a third-party organization as long as it's done under the program of commercial grade dedication.

MR. TANEJA: Well, actually it would still be commercial grade dedication, right?

MR. RAHN: Right.

MR. TANEJA: So it's being done right now already, right? Like -- I don't know, there's a number of these third-party suppliers like -- I don't know what the name of these companies are, but when I worked with them it was Nutherm and there was a --

MR. RAHN: Oh, you mean the dedicators, commercial grade dedicators.

MR. TANEJA: Yes. I mean these people --

MR. RAHN: Nutherm, NTS, AZZ --

MR. TANEJA: Right. They were doing the same thing, right? But like they have to be an Appendix B entity to do this activity. Now whether the licensee does it themselves, are they buying from one of these entities which do the dedication activity for them, right? But it's still a commercial grade dedication activity.

I think that third-party certification is like -- the example that I was looking at was done in the oil and gas industry. Exida is an entity that does certification, right? So I was just going through their database yesterday and I pulled up like a report on certification of a Emerson Process Management safety ovation, safety instrumented system. IT's a small PLC with like a 16 I/O device. But the way it's done by them, you know, I think one of the questions came up that when you do the certification, do you have access to all the design information, right? Here, Emerson is the requesting party that went to Exida and said hey, certify it. And the certification is done to an IEC standard and it's certified to like -- this one is certified to SIL 3. So Exida is a qualified certifier that certifies to IEC standard.

When Exida was asked to do that, they had knowledge of entire product, their software code, their design information and it looks like when they were doing the certification, they do a lot of testing and they do -- TUV does the same thing in Germany. So they even made some design changes before they were able to certify it, right? So this, to me, when I read that I thought it was meant that you have somebody then who

issues a certificate and now you identify your -- this is where it's going to get more work for the nuclear industry.

Now the application has to be identified. What's the level of that application? The design of that logic or of that, you know, implementation has to have some measures or means to know what SIL level for that safety application, SIL 1, SIL 2, SIL 3. So once that determination is made, and if a plant says okay, I need to replace this component, I can just go buy a SIL 3 component with a SIL 3 certificate and I don't have to go through a dedication process. It's been done by that.

Is that what you guys are thinking? At least that's my thoughts were when I looked at this thing.

MR. MUNDY: Well, I'll toss out a partial response to that and basically it is that I would ask maybe to defer until we're able to walk through the Appendix Charlie submittal. I think the answers to that would become clearer as we go through.

MR. TANEJA: Okay.

MR. MUNDY: If you don't mind.

MR. TANEJA: So from MP #3 perspective I

think, like I said, we really primarily have two tasks in there. The second one was looking into this possibility of third-party certification. And that -- before we go much further on that one, the first step that would be is to answer the legal question, is it legally possible to do it? Okay. And then we can go beyond that and see what exactly we are thinking and what is feasible for operating reactors and new reactor space.

Anything, guys? David, do you have anything to add to that? I think that's really what I was thinking, you know.

MR. RAHN: Yes, I just wanted to say at this point in the game that we're open to suggestions and discussion, so we don't want to table anything. My thought on the write up in the MP #3 description is that we want to evaluate what's out there, not necessarily the four items that are here in the reg guide. There are other things out there.

MR. TANEJA: Right.

MR. RAHN: I think we ought to be open to a lot of potential inputs. But the other thing is we need to be cognizant of the structure that we have in place which has some activities like verification of

identified critical characteristics that have been built into the system.

MR. TANEJA: Right.

MR. RAHN: And maybe better guidance for identifying for digital items, specifically, what are the applicable critical characteristics that we need to be cognizant of. Even though some of these standards that are listed in the endorsement have additional criteria and it's been out there for a while, the 107339, for example, and the 1011710, I mean some of these have been out there for a while. Those have good ideas in them, but there's no okay, there's no -- like somebody says this is the list of things you need to identify as your critical characteristic for this type of equipment. So to me, there's some engineering planning involved, as well as surging for guidance documents to endorse.

MR. GEIER: If I can just mention something, just something to keep in mind as we go forward, I appreciate Dave's comments, particularly on keeping an open mind because we did put forth a proposal, but part of it, the whole reason for having these meetings is to engage on these and decide what might be a reasonable path forward that can make use of maybe some

activities that are already going out in the industry to allow the dedication of these.

There's activities such as commercial grade surveys. I don't think the idea would be the certifying the SIL -- certifying would be -- because as you say it's got to be Appendix B, somebody has got to take that Part 21. So I think even in that case it would still be the licensee or, in fact, the supplier that would be accepting the Part 21 responsibility and therefore accepting that as under their Appendix B program.

So I would say I appreciate and at some point it is probably reasonable to take it back to legal and say okay, does this fit in with what Part 21 says and allows as a commercial grade item. But I think we should wait a little bit and go further down the road and kind of agree on kind of what we're -- what may be a reasonable approach, particularly given that commercial grade dedication process from the EPRI days back in the late '80s, early '90s, it is a pretty well defined process. And the process itself is going to be the same no matter what type of item or equipment it is.

There's some uniqueness about digital just because of the software, but the process of identifying

critical planning, identifying critical characteristics, and coming up with acceptable methods to verify those critical characteristics to be allowed that safety-related application, that process is the same. It's just how you apply those for the specific equipment that's the question.

I think that's what -- and EPRI certainly would chime in on this, but that's what the EPRI guidelines with respect to digital tried to do. And I think it's certainly reasonable to say hey, is there some things here, particularly given those were also generated back in the '90s that maybe today's equipment and the whole idea here of modernizing our regulatory infrastructure is there may be some open issues that need to be addressed in either revised guidance or new guidance out there. So we're certainly open to talking about that right.

MR. TANEJA: Right, right. And you know, I would say to the NRC position on that we prefer endorsing a consensus standard rather than developing a guidance on our own, you know. So it would really be something that probably would have to work with industry and developing some type of a consensus stand-alone methodology.

MR. GEIER: I think that's the whole idea here of these meetings and kicking off these and it's similar to what we've been doing on the technical side, on the 50.59 side, you know. We'll probably come up with some additional actions after we have some discussion about what might be a reasonable path forward here.

MR. TANEJA: So, you know, I guess discussing -- and this is what we had in MP #3, these two primary items. Now right now we are in the process of revising or updating the integrated action plan and I think we are aiming to get that done by end of November, is that what we're working towards?

MR. CURTIS: One more time?

MR. TANEJA: The revision to the integrated action plan.

MR. CURTIS: I think it's due in December.

MR. TANEJA: December, right. So you know, it's the opportunity for us to really fine tune what we want to do in MP #3, as far as exactly how we proceed moving forward with these activities and kind of retune our -- and recalibrate ourselves where we are.

MR. MUNDY: Good point.

MR. TANEJA: So Dean, with that, I'm going

to let you now go through and see what you guys had in mind when you guys issued that Appendix C, Appendix Charlie.

MR. MUNDY: That's a good segue. I appreciate the patience of the folks on the phone because it would have been very easy to chime in. We've had a lot of conversations, as you can imagine, internally about the topic and people are invested in it and can talk a lot and very astutely on the topic. So at this point I'll hand it over to or I'll ask Dave Hooten to walk us through, if now is the right time, to talk us through Appendix Charlie, at least in overview form.

And I guess in that process, Dave, if you can or with Matt and others, other support and sort of reflect on what the folks have said in the room here and respond to some of the thoughts which again I did want to jump in and go down a dirt road outside of the context of walking through documents. So Dave, if you would?

MR. HOOTEN: Sure, and again, this is Dave Hooten with Altran. And I appreciate the opportunity to participate in the meeting today.

From what I heard discussed so far, my perception is that there are some fairly important

nuances and subtleties to the Appendix C proposal that may not have been communicated and therefore understood as well as I had hoped. And as the primary author of Appendix C I'll take responsibility for that. And I will try to rectify that as I go through this discussion and try to make it more clear exactly what it is that we were proposing here.

It kind of started with a recognition that there are a number of other process industries that -- like the nuclear industry have an interest in safety and safety of the public and of employees at their facilities and what not. And they use digital I&C equipment as well and how do they approach that?

The other thing we noticed is that these other process industries have made a lot more progress than the nuclear industry has in deploying digital I&C equipment in safety applications. And without getting too far down a rabbit trail of why that might be, a couple contributors are that a lot of them had a very mature and broadly used process by which digital I&C equipment is certified or qualified to be used in safety applications and that helps result in a greater relative availability of that type of equipment for those industries.

Contrasting that with the nuclear industry, we have kind of our own private process on the 10 CFR 50 Appendix C and I'm not saying that's a bad thing. I'm just saying it's different. It's not the same process everyone else uses. But when it comes to digital I&C equipment the reality is that almost none of it nowadays is produced from the ground up using a Part 50 Appendix C process. Almost all of it is commercially dedicated in some manner or other.

And as you all have mentioned earlier in the meeting, there's a couple of EPRI reports that are used heavily to do that for digital equipment, namely TR-106439 and TR-107330, the latter of which is primarily focused on PLC-based platforms and then the first one is kind of more general and then is geared more towards the individual digital component or device level.

But anyway, the result of that is that when a licensee wants to go get a piece of digital equipment, they use it in their plant in a safety-related application, they have to enter this dedication process which is almost always a first-of-a-kind effort and there's a lot of uncertainties involved with that with respect to the duration of that effort to cost and

whether or not you're ultimately going to be successful or not. And this is exacerbated by the fact that because the nuclear market is a relatively small one compared to other markets, a lot of the OEMs that produced digital I&C equipment aren't real excited about participating in and cooperating in commercial grade dedication effort. I'm not saying all of them, but this happens in a number of cases.

Those problems don't exist in the other process industries and that's primarily because they leverage and utilize this safety integrity level that's rooted in IEC 61508 and related standards. And that they also utilize this concept that you talked about of third-party certification, independent third-party certification to particular safety integrity levels.

So the process is for getting certified for safety integrity levels for both hardware and software which is important and the criteria for doing that was developed with if you were keeping in mind the fact that technology changes rapidly. And this kind of relates back to one of the initial goals of the NRC's Digital I&C Action Plan which was to try to move the regulatory framework towards a performance base and have it be less tied to the particular technology of the day. So the

process used in the SIL certification is very much consistent with that objective.

Anyway, there are primarily three safety integrity levels. What we were throwing out here is an initial proposal for our folks who deal with safety integrity level 3, because that's the highest one. And the safety integrity level 3 certification deals with a lot of quantitative criteria for hardware, but it recognizes that because software failures or malfunctions are systematic and not random and that you have to use qualitative methods which is very similar with NRC staff's philosophy. And the safety integrity levels define the rigor that's needed to be used in the software development process and it's based on that. And there's also that graded approach depending on whether safety integrity level 1, 2, or 3. The safety integrity level 3 would be the one that would require the most rigorous approach to the software development process.

As I said, there's a wide range of manufacturers and system suppliers and what not that are involved in this whole safety integrity level and independent third-party certification. And what we're really interested in is not necessarily replacing what

we got with that, but rather leveraging it or utilizing it within the commercial grade dedication process. And what I mean by that is in commercial grade dedication of digital equipment, you've got to break the digital equipment down into two parts. There's the base equipment that you get or what I would call out-of-the-box equipment, software that every user gets when they buy that equipment. That's separate from you do with that equipment once you've purchased it and you're ready to apply it in your facility.

The software needs to be configured and that could be very simple. It could be selecting user configurable parameters that are kind of pre-designed into the product. Or it may involve the development of complicated applications software for more complex applications. But regardless, there's a distinct separation between the hardware and software that you get out of the box and the software that's developed and configured by the user or for the user's representative before it's applied in the facility.

So to be clear, what we want to leverage here is the third-party certification to SIL level 3 or whatever level is appropriate in order to demonstrate a basic fundamental quality of the hardware and software

that you get from the manufacturer or the supplier. So when you relate this to a commercial grade dedication process, right, we talked about critical characteristics, and these critical characteristics are going to be a mix of things that related to the basic quality of the item that you're dedicating and others that are critical characteristics that are related to how you are applying that particular digital equipment.

So again, the SIL certification doesn't so much relate to the application part of this as it does to the basic fundamental quality of the out of the box hardware and software. So the vision that we had when we prepared this Appendix Charlie that if a particular visual component or platform was certified to a SIL 3 level by an independent third party, then we could say all right, the basic quality of that hardware and software is accessible. We don't need to spend a lot of time and effort evaluating that and trying to make that determination. Instead, the commercial grade dedication effort can then focus on how that particular visual equipment is being applied in the plant. And we believe that that's a much more beneficial and appropriate use of both licensee and regulatory resources in support of the ultimate goal of safety.

So again, we're not trying to obliterate the existing commercial grade dedication process for digital equipment, but rather trying to leverage this third-party certification process to establish basic quality of the equipment and then go from there and focus on how the equipment is being applied. And we believe that this is a totally out of left field, if you will, type of idea because of the example that we listed in Appendix C from the 2001 SCR that was issued on one of the PLC based platforms where it was pointed out that the third-party review by TUV-Rheinland was significant in the NRC staff's acceptance of that particular PLC-based platform. I have a couple of quotes in the appendix that supports that notion.

So again, the concept of leveraging third-party certification is not new and it's been used before. So again, in summary, what we're proposing is using third-party SIL certification of digital equipment within a commercial grade dedication context with sub to basic quality and then move on to focus on the application of that particular equipment or platform to whatever it may be, whether it's a protection system replacement or whether it's a replacement of an individual digital component like a

transmitter, a valve position or a recorder, a single loop control or whatever it might be.

So hopefully that clears up some of the nuances of what we're trying to propose here and I think the legal issue that you've raised that you've expressed a concern about might not be as big an obstacle with the clarifications in mind. I don't think we're necessarily asking for the third-party certification to completely take the place of the existing commercial grade dedication process, but rather to allow the third-party dedicator whether it be a separate vendor or utility to perform that dedication with a lot less I'll say first of a kind effort because of the ability to utilize that third-party SIL certification.

I'll stop now and let you ask some questions there to make sure we've got a clearer understanding on the proposal. That's my best effort right now in trying to clarify exactly what we're looking for in this topic.

MR. TANEJA: Dave, this is Dinesh. So I think what I'm hearing is that we are still performing commercial grade dedication activity under Part 21. but we are taking credit for this effort that's been done by the certifier on certifying it to a SIL level and taking credit for that effort and not duplicating that

when we do the dedication activity. Is that how we want to try to frame this activity?

MR. HOOTEN: That's what I had in mind when I wrote this because if you go back and look at especially some of these larger platforms that have been certified or -- I don't have the right word, but it's been reviewed by the NRC and had SCRs issued, there was a tremendous amount of time and effort spent I'll say looking under the hood of those platforms and trying to make a determination that those platforms had adequate quality in their fundamental hardware and software. And we think that that effort is fairly redundant and a duplication of effort to what goes on with the SIL third-party independent certification. And if we were able to take credit for that and use that as a starting point, then we can go straight to focusing on how that platform or how that equipment is being applied in the plant and that's really I think where we get a lot more bang for the buck in terms of the utilization of regulatory resources and expertise. So yes, that's really I think what we're asking.

MR. TANEJA: Yes, you know, you are referring to some of these SERs that we wrote. I think we recognize that TUV did certification of I think it

was Triconex had the SIL certification, but I don't know if it gave any credit to it. We kind of said it's a good thing, but what you are asking for is a process that actually gives credit to that certification effort that's already taken place and then not have to do the duplicate work of identifying the critical characteristics, looking at the software, reviewing the code and doing all that activity during the dedication.

MR. HOOTEN: Well, not exactly. You still have to look at the critical characteristics that are specific to how the digital equipment is being applied.

MR. TANEJA: Right.

MR. HOOTEN: It's the critical characteristics that we're saying don't need to be looked at are the ones that are related to the basic fundamental quality of the digital hardware and software being used that comes from the manufacturer out of the box. Now the software that's developed by or on behalf of the end user, what we call the application software, that still needs to be looked at just the same as before because that's new and unique to each application. Do you see the distinction I'm trying to draw there?

MR. TANEJA: I've got it. You know,

typically what I would say is that a TUV certification or SIL certification may not do seismic testing for example. Okay, that would be a requirement that we would have based on our applications. So you probably would have to supplement of these type of things or I don't know doing the EMC qualification as part of the SIL certification.

MR. RAHN: I think they expedite.

MR. HOOTEN: And I mentioned that in Appendix Charlie. I said that if the scope of the SIL certification doesn't cover certain things and I think I actually listed seismic as an example, that wouldn't be Part 2 should ignore that. That would still have to be addressed on a plant-specific basis. But again, you were only talking, only asking to leverage the SIL certification to the extent of what it covers.

MR. TANEJA: Okay. I think I've got the picture.

MR. HOOTEN: I would also like to clarify regarding the precedent of the TUV certification on the Triconex. I think if you look at the exact quotes from the SER, the reliance on that was a little stronger than I think maybe we're remembering here. I'll just read a portion real quick of two quotes. One was, it says

"It should be noted, however, that acceptance of the PLC systems is based to a large degree on the TUV-Rheinland independent review."

And then a second quote, it says "A significant portion of its acceptance is predicated upon the independent review by TUV-Rheinland." So again, I don't think that what we're asking for here is radically beyond what was done in this previous case. We're just asking if it can be applied to a wider range of equipment, if you will.

MR. GEIER: A key point is saying it's not a standalone. You have to still sit there. You look at equipment. You do your critical characteristics review based on the application of the safety function of where you're going to put it, what it's going to perform and then you go through those and some of those you're going to do by independently verifying and there may be a couple that you take credit for the SIL certification if it's applicable. By itself, it's not a standalone, full range of acceptance.

MR. TANEJA: I think the way we have it captured in the MP #3 write up is that we considered that, you know, the activity to have like a third party just giving you a certification and then you're using

the product without, you know. So that is significantly different than what I think you have in mind here. So that's some clarification that we definitely want to capture in our revision to the MP #3.

Given that's the route we want to go, so like I talked about reviewing the existing guidance and standards on doing commercial dedication of digital components and enhancing those items. Here, we are almost looking at a maybe the same sort of guidance can address this issue, but then we probably -- correct me if I'm wrong, it's probably looking for industry to come up with --

MR. RAHN: Maybe a proposal for fitting it together.

MR. TANEJA: Fitting it together like a consensus standard or a guidance on this process, right? That's what I would think is probably the right way to go. Yes, the IEC standard is out there. ISA 84 is out there. And maybe we need to understand exactly the effort that goes into a certification activity and thereby we can say that if that's already done, therefore you don't need to repeat some of these other activities. So it's almost like we need to develop some type of a consensus standard in that area.

MR. RAHN: When you say consensus standard, you've got to be careful because --

MR. TANEJA: Well, you know IEC standard and ISA standard are consensus standards, right?

MR. RAHN: I agree, right. But EPRI guidance --

MR. TANEJA: Those are not.

MR. RAHN: Is not a consensus standard.

MR. TANEJA: I understand.

MR. RAHN: Right.

MR. TANEJA: But you know, preference would be is I should go back to ISA and say ISA 67, take 84, and come up with ISA 67 standard.

MR. RAHN: Didn't we suggest that?

MR. TANEJA: We were trying to suggest that, but nobody wants to try that.

MR. RAHN: That would be ideal for us if a standards organization picked up the ball and ran with it.

MR. HOOTEN: This is Dave again, I just want to be clear, too, that the Appendix C proposal was not asking the NRC staff to blanketly and in its entirety endorse IEC 61508 because there's a lot of stuff in there beyond SIL 3 certification, that the reference to the

61508 standard was merely because it provides context to what SIL certification means, but we weren't asking for an overall endorsement of that 61508 standard, just the use of the SIL certification aspect of it.

MR. RAHN: The concept has merits. The question is how do we pull it off?

MR. GEIER: How do you clarify how it can be used and maybe the limitations of using it?

MR. TANEJA: The structure of the dedication activity, right, I mean you know like if I go back and if I look at the EPRI guidelines 106439, it's a pretty descriptive methodology that's laid out on doing dedication, so we need to probably fit in this certification within the context of that whole active area as to where it fits in and how do we actually have a common position on how you take credit for it, right?

So it's not left up to an individual reviewer and I guess when we are quoting this thing from the SER for I think it's from Triconex SER if I'm not mistaken, right?

MR. HOOTEN: Yes, it is.

MR. TANEJA: Right. So it really is left up to the reviewer and the NRC to say okay, yeah, I feel good about this one. And I'm saying rather than getting

away from I feel good about this to we develop a common understanding on how much credit is due based on the activity that's already been done.

MR. RAHN: In any evaluation, even on this one for Triconex, it's limited to how would it apply, would those particular sentences apply. It didn't apply to the entire evaluation of the 9.6 platform. It was more focused on the software processes and not -- even though there's some intermingling, but -- and there may be other cases where we have good information about the software development process. I think we ended up having good information on the Siemen's platform, for example, but again, that process was like a thread audit.

MR. TANEJA: I believe Siemens also had a TUV certification.

MR. RAHN: They did, but I don't remember a similar statement in Siemen's SE.

MR. TANEJA: That's what I mean, you know? It's an individual choice. Whoever did the review, maybe the person doing the Triconex felt that that was a good effort and whereas the person was looking at the Siemens' platform maybe didn't think it was that credible. I don't know. I'm just saying it was the

reviewer's choice, you know?

MR. RAHN: Actually, I was just at their offices a couple of months ago and TUV has an office like half a block down the road from their Erlangen office. I'm sure they have a very good relationship with TUV.

MR. GEIER: Kind of what we look at and I know you're looking at it from guidance to your reviewers or your inspectors. We look at it as guidance to our dedicators, the people who actually perform the task so that we have consistencies and there's an understanding. Because we want them to do it right. We don't want to have inaccurate or inappropriate verifications going on. We don't want violations or things like that, so it's very important that the guidelines we put out there are something that we both concur with and can live with. So whether it's somebody reviewing it from the outside or there are people actually performing it, really, it's all -- there's a collaboration under way, clear guidance so they can do it right the first time.

MR. HOOTEN: This is Dave again. The other thing real briefly I'd like to mention is that completely understand all the strengths and weaknesses,

pros and cons, limitations, et cetera of the SIL certification process, I know that EPRI had some research plans for next year to dig into that to a much greater extent and I don't know if you were going to discuss that at all, but Matt Gibson is on the line and he could describe a little what they have in mind to do next year on that.

MR. MUNDY: Good point, Dave. We were just -- Steve and I were just in the background trying to find out a good segue to that and that would be the next part of the agenda beyond the break which is -- we're past 2:45 now, I'm talking about the activities, prioritization, and schedule would be a good time to talk about that research because it's one of the topics or one of the -- on the activities. But I'll look to Dinesh to either take a break or defer the break or how you want to --

MR. TANEJA: It's a good time.

MR. MUNDY: I'm okay if we want to or don't or want to shorten it because we're -- we're at 2:50.

MR. TANEJA: I mean if you guys are okay, we can continue. If you want to take a break, you know, I think we can continue.

MR. MUNDY: Continue? Two hours is about

right. Two plus hours that's all we've got. If you are okay with continuing, I think we are.

MR. TANEJA: Everybody else is okay? All right, let's continue then. Good.

MR. MUNDY: Yes, Dave, I think that was a good segue and Matt, if you're prepared or want to say a few words about the activities that we proposed, the tentative schedule and how that involved EPRI and the approach that we discussed and how that could or might happen.

Matt, are you still there?

MR. GIBSON: This is Matt Gibson at EPRI. I apologize. I'm having a hard time hearing a lot of what you're saying. Here's what I think you just asked me to do is to describe the research we had planned for next year to support third-party certification. Is that true?

MR. MUNDY: That's correct, Matt.

MR. GIBSON: Okay, so what we're planning for research next year is to investigate the efficacy of the SIL certification to determine well, just how good are they? You know how accurate are they? What measurable impact do they have in the reliability of the equipment that's certified. Basically, does the data

on reliability for equipment that has been through a SIL certification or received a SIL certification, does it bear out that that equipment is indeed highly reliable? And we plan to do that by doing a good bit of data mining with equipment vendors. These would be outside of the nuclear industry. So the nuclear industry really doesn't have enough equipment installed that's SIL certified to bring a significant data set.

But outside of the nuclear industry is a lot of equipment installed that's SIL certified that has reportability requirements. We will interface with both vendors and the certification authorities because there's the rough equivalent of a Part 21 requirement to report things to happen to support your continued certification.

We're going to mine all that information and see if we can gather enough information to demonstrate both correlation and causality for the certification. Those things we want to achieve with that research is to find out the limitations scope-wise of a certification.

Dave mentioned earlier that there's a few things that may or may not be included in that, but we should draw out that a typical SIL certification does

include a vibration and some seismic tests independent on what the additional IEC requirements are for that certification because not all requirements -- there's a process that's contained in 65508 that some of the additional, like EMC requirements and seismic are included in other IEC documents and it's very typical to have a SIL certified device potentially at or exceeding U.S. EMC requirements for nuclear power. So what we want to do is understand the nuances of all that about what derivative standards may or may not be invoked and just characterize that. And that's the niche of our research next year, really to understand the value and potential of these SIL certifications to simplify the technical review of these systems for safety and critical applications.

MR. TANEJA: So Matt, is that project approved?

MR. GIBSON: Oh yes, we're doing that.

MR. TANEJA: Okay, so what's the schedule on that?

MR. GIBSON: I expect to finish it before the end of the year, next year. Now the uncertainties about schedule really involve the level of engagement we can achieve and how fast we can get engagement with

the data holders. You know if you think about it, some of this data, it may take a certain element of courtship, if I can use that word, with the data holders if they ever get access to it. We have to also validate that that data is accurate. In other words, we have to give some access to that, data holders' internal QA requirements on the data so that we can characterize it like any good scientific thing you do. You understand your quality data sources. So we have to do all that, so to actually do the analysis of the data and some of the other things really doesn't take that long, but it's going to be the data mining that might. I'm not sure how fast that will go. But I think we can finish next year. We probably publish late in 2017 or early in 2018.

MR. TANEJA: So this report that will come out basically is just evaluation of the SIL process? that --

MR. MUNDY: And the effectiveness.

MR. GIBSON: It's an evaluation of the outcomes of that process. In other words, the process is pretty well defined. The certification authorities go through that process and know what that is. What we want to validate is does that actually make a

difference? Is there a measurable and documented reliability improvement that can be demonstrated for things that have a SIL certification. And the reason we want to do that is to prove empirically that if you accept the SIL certification at the scope at which it is done, which would vary from one SIL certification potentially to the next, but if you look at the scope of that certification and say yes, they cover these things, then the idea is you can accept that certification, a third-party certification without further analysis other than a scope and adequacy analysis.

You look at it to see well, did they cover these topics? Yes, okay. That's a pretty minor quality review and then you just say all right, if they did that and once you know the scope of the SIL certification, then you know the balance of the scope and then it will have to be further evaluated in design and regulatory space.

MR. MUNDY: Design and application notwithstanding.

MR. TANEJA: Right, right.

MR. MUNDY: You can just use anything.

MR. TANEJA: So Matt, is your research, are

you going to also look at the capability and qualification of the certifier?

MR. GIBSON: Yes. We need to understand what measures are applied to certifiers. We think we understand that some because they are, they go -- they are audited and stuff by third-party auditors and that kind of thing. But beyond that, I don't know -- we don't know a lot about the efficacy of those audits and how that works. So we're going to look at that, too. The sort of the entire echo system, if you will, of SIL certification.

MR. TANEJA: Okay. I'm looking at you because is there something that you would look at if you were looking at a vendor?

MR. ORTEGA-LUCIANO: Oh, yes. The question that I have the whole time is who will be certifying this? Who will be responsible for the certification? Who will be responsible for the oversight of that entity during the certification? How are the certifications going to be controlled and maintained, uniform over the years? Improvements, who is going to gather improvements? Is this certification party an Appendix B supplier? How is quality being verified and validated because we -- not to bring -- we

did something similar with calibration of equipment with ISA 17 or 25. And it took more than ten years for all the parties to get together and reach consensus of how quality was going to be estimated on the whole process.

Finally, we did not -- we do not endorse ISA 17 or 25, but we find that the technical requirements and the methodology used to do uncertainty and calibration of equipment makes the intent to cover some of this difficult critical characteristics which is going to be -- it would not be efficient to recreate this every single time through the calibration. But it took a big effort to find out who was going to be held responsible for this.

And finally, the licensee seeking forward and they say we're going to, as a licensee, we're going to commit to do 1, 2, 3, 4. Are we going to be assistant to meetings with the ISA international committees? Are we going to look at oversight of all the regulatory bodies across Europe and Asia and then we're going to integrate all that into this consensus and maintain the standards every year?

So it was huge effort and that's all the questions I'm asking myself. The SIL certification

that was going to be responsible, if this is going to be addressed in an appendix then you can take reasonable assurance that the certification is being controlled and all those questions. Because again, as you try to envelop the basic information that will be common to every single practice, I can see that as an efficient process. But again, who will be responsible to envelope that and make sure that it's consistently applied over and over and then these entities that get certified, are they going to be certified on behalf of a commercial program or they are certified, they have an Appendix B program, all those questions I ask you myself how it's going to be controlled. Who is going to be responsible for that?

MR. TANEJA: See, it's almost like a supply chain question, right? Now let's say Appendix B dedicator, right, he buys a SIL-certified product as opposed to buying a commercial product, right? So on a commercial product he does his survey. He goes and looks at the QA program of the manufacturer, right? It's part of the activity or whatever. So here, we have to probably answer this question that how do you accept that the SIL certification has some merits to it, right? The certifiers. And I think that's really where the

supply chain portion falls into it?

MR. MUNDY: I'll ask Matt --

MR. GIBSON: If I could inject here. SIL certification uses a supply chain activity. I mean it's done. Manufacturers do it for the equipment that they provide. So it is, in fact, a supply-chain activity. So when that particular component or device which can be quite a complicated thing, depends on the scope of the certification, we'll call it an engineered product, just so we don't overuse different terms that have special meaning.

Any time you have an engineered product that's been certified, then you know it's a supply chain thing. And so when you buy it, you get the certification and so that certification has an echo system behind it that does many of the things you're talking about.

Now our research is simply going to be discover how it actually works and what the efficacy and reliability of those things are. Now how that flanges up to the regulatory process will really be up to some of the other folks in the industry and even you guys at the NRC that decide how you want to treat that. So we're not going to be analyzing it against current NRC

regulations or anything like that. We're going to do the analysis how it actually works, how good it actually is technically, and what its reliability of that process is, guarantee, that the equipment is, in fact, reliable. In other words, can you believe the SIL certification within the scope of what the certification says? Can you believe that the certifier actually did their job, that kind of thing. That's the effort we're going to go after.

MR. MUNDY: In fact, the technical basis for third-party certification.

MR. GIBSON: Right. And you'll answer a lot of your questions, but it won't seek to go beyond that. You want to know what actually happens.

You can read our report I think at the end of the day, but -- and it will hopefully be able to give you some qualitative and quantitative analysis that supports the relative goodness, if you will, of this process or we could potentially find flaws and decide well, you know, it is a good idea.

I don't know how it will turn out actually, but I do know that a lot of people use this process in the industries where the machines can kill people in milliseconds if they don't work right and so some good

is going on in that area. And it's something that I think we can leverage.

MR. MUNDY: And Matt, I guess I'll ask you and maybe if you can or want to now address some of Jonathan's other questions about -- and the ones we would have anticipated about I'll say certifying the certifiers, right? And what our intent or lack of intent is in that respect.

MR. GIBSON: Say that one more time, please?

MR. MUNDY: Well, just the question he had about how do they approve or not approve the certifier. I believe our thinking or intent was that we wouldn't anticipate or expect the NRC to have to dig into that level of -- or be in the weeds of certifying the certifiers, but rather --

MR. GIBSON: Right, right.

MR. MUNDY: -- I'll say endorse the process by which they are certified.

MR. GIBSON: You know how that happens in regulatory space, I'm not sure how it will turn out, but our objective in the research is to find out how the certifiers are certified, right? And just expose the effectiveness of that process. And then I think then

those in the regulatory community can analyze the efficacy of that and decide how they would want to approach it, you know? Maybe it's good enough that you say well, it's pretty good. And we don't really need to look at it too much. Maybe there's a whole thing going on out here that we can take advantage of.

If there's gaps or something, then maybe there's some delta things that need to be done to ensure all the i's are dotted and t's are crossed. But I don't know how that will turn out quite yet as far as what we'll discover. But we will discover how that's done so you can understand that fully.

MR. RAHN: Matt, this is Dave Rahn. One of the things that we understand about the process is that when Exida or TUV issues a certification for something, they usually do it in conjunction with a safety manual that describes the conditions and the assumptions and the characteristics of the configuration that were being certified. And it's possible that there may be the same manufacturer and model number component that may have been certified with different levels and then they have a different safety manual that goes along with it.

So one thing-- it would be interesting to

find out if you haven't already built it in, is whether or not you see a difference in the resultant reliability of the certification process if something were to be certified to SIL 2 and to SIL 3, if they're the same component.

MR. GIBSON: Yes, well, I mean we want to understand that fully because at the end of the day, the SIL certifications are a measure of reliability. That's what they're designed to do. The premise is if something is highly reliable, then it can be further used for safety applications which then would put it together into a whole system. And of course, that system itself as a whole system would have to be looked at for its fundamental application level and system level reliability.

So yes, we'll look at that, the different levels. Maybe there's opportunities to utilize SIL 2 for some less critical -- you know, there's been the concept I think thrown out by some of the utilities that maybe there's a -- I think the chillers are a popular example right now. Maybe a chiller could be a SIL 2 thing versus a SIL 3 thing. I don't know that, but I'm trying to answer your question as a possibility once we understand how this works and what the level of

assurance that's achieved would be. We can document how that is and then folks can use it as appropriate I believe.

MR. YANG: Matt, this is Yaguang. I have a question about your research. When you looked at different certifiers reaching the same conclusion for the same product --

MR. GIBSON: Hold on a second. Could you come a little closer to the microphone? I'm having a hard time.

MR. YANG: When you looked at the possibility that different certifiers, when they certify for the same product, but reach different conclusions, for example, when certifiers believe the product is SIL level 1, the other one they think that the same product can actually be SIL level 3. Say if you have same product, you reach two different certifiers. Are you going to look at different certifiers will reach different conclusions?

MR. GIBSON: Again, I have to apologize. I am really not hearing --

MR. RAHN: Matt, this is Dave. I think what he's asking is are you going to be looking at the possibility that two different or three different

certifying organizations may have provided different levels of certification to the same manufacturer or model number components?

MR. GIBSON: Well, you know, that's a good suggestion. I think we'll include that as we look. I mean what you're really describing is what the repeatability is of the certification. That's the way I would describe it.

MR. YANG: If we are processing good enough, everybody uses the same process, reaches the same conclusion. That will make our field more comparable. But say if they cannot reach the same conclusion but the conclusion is very close, which may be okay with us, but if the conclusion is totally different, then it will have a big trouble for us. Say one certifier say the product is level 1. The other one believes it's a level 3.

MR. GIBSON: Wait. I mean that's a good suggestion. We'll put that on the pile as far as something to look at.

I will say though that I suspect that the amount of data we'll have for that will be -- we'll analyze it for sure.

MR. YANG: Okay.

MR. GIBSON: I don't think that we're going to find a whole massive amount of components that have been multiple certified by different certifiers so we can compare the two. But we might can say take one generation like a version -- you know like when a company does this, sometimes the first version they put out, version 5 will be done by TUV and version 6 will be done by Exida or somebody else.

So it's possible we could look at two very similar different, you know, version levels that are essentially identical. You know what I'm saying, with some minor changes that are germane to the certification and see how close they match. Hopefully, there will be a few of those in the database, data set that we can look at.

MR. YANG: Okay, thank you.

MR. TANEJA: Time check?

MS. LAURON: It's about 3:15. So it's around this time that would open up the lines and ask for public comment or to provide questions. Unless there are some closing remarks anybody wants to make.

MR. TANEJA: Why don't you go to the next slide. Let's talk about the next steps, I guess.

MR. GEIER: We need to get into that. The

next steps, the kind of actions that we take, take out of here.

MR. TANEJA: So basically this is the schedule that we have in the MP #3 activity right now. So where we are is the item 4 which is this meeting that is taking place right now. So I don't know whether these subsequent items that we have there are still adequately defined. I know we're going to issue the reg guide. We know that for sure. So that's activity 6 is still valid.

Activity 5 assesses the meeting and then comes up with endorsing the EPRI guidance, and later the commercial grade dedication.

I think what I'm hearing is that the two tasks that I identified in the MP #3 that we have, they're not really two discrete tasks, but they are intertwined tasks. It appears almost to that way. So what I would say that maybe since we do need to update the integrated action plan by the end of the year, that if you guys can provide me comments on this MP #3 scope activities based on the discussion that we had today and then we can probably see how that activity should take form and shape.

MR. CURTIS: Dinesh, just a clarification

on the question I answered earlier. So we owe this update to the Commission in December. Our due date was actually last week. It doesn't mean we can't get some flexibility in there, but we're going to need something really fast.

MR. GEIER: Based on this discussion, I think those activities are still accurate and acceptable. My understanding is I think the plan would be updated every six months, so given the fact that this is really our first interaction, there's more work to be done and more discussion to be had. I think this is really kind of just clarifying what's in there.

To tell you the truth, I wouldn't recommend changing those activities right now. And I think as we kind of move forward in early 2017, it will come together on maybe what those are and in the middle of the year, middle of 2017, maybe we'll have a better read on what those actions will be. But there's nothing I think on there or everything that's on there for the first half of 2017 --

MR. MUNDY: If we were to combine them, there's a little bit more detail in our Appendix Charlie than was pulled into MP #3. I think you're certainly at liberty to incorporate more of that where can just

continue to work through those details as we continue this effort.

MR. GEIER: I think we can look at the write up there and probably get back to you next week some time, whether we think there's any substantial comments that we want to provide, at least give you kind of a thumbs up or -- I'd feel remiss if I didn't walk away with at least one action item which we'd get back to you with that. I think if we can circle the wagons with our folks sometime next week, we'd get back to you with whatever input we think makes sense. So through your next draft, not that it isn't a living, breathing document, we'll do that.

MR. MUNDY: The way I look at it is there any failed flaws or any kind of significant changes we would make really based on where we are today. I think that's pretty reasonable.

MS. LAURON: I think I may have lost the webinar link, but I think all of you called in through the NRC bridge line so you all should also still be able to hear me.

Angela, can you confirm with the participants if they can still hear us? Angela?

MR. GIBSON: I can hear you.

MR. HOOTEN: I can't hear you very well.

MS. LAURON: Sorry. Can you hear me now?

MR. HOOTEN: Yes, that's better.

MS. LAURON: Angela, could you confirm with the other participants on the phone call if they can still hear us?

OPERATOR: Yes, they can.

MS. LAURON: Okay, great. Thank you.

OPERATOR: You're welcome.

MR. TANEJA: We're done with all that. So you know, I guess the way I'm looking at it is the next step that we need to clarify the objective of this task and clarification that I'm thinking is that this integrated approach of how we can take credit for SIL-certified work into the commercial grade dedication activity.

MR. MUNDY: Certainly one key part, yes.

MR. TANEJA: Right, and should we then independently still pursue evaluating the guidance and standards that are there on digital devices for commercial grade dedication?

MR. CURTIS: The potential of endorsing the new reg guide.

MR. TANEJA: Right.

MR. CURTIS: I guess really the key question is is that an effort, if there's ten things that we can do is that something that industry would value for us spending our time on now or is it something we should be doing other than that and do that later. That's, I think, the key question.

MR. MUNDY: Unless Matt or Dave or Wes or somebody wants to jump in, I'll defer an answer to get back to you next week on that one once I can get everybody --

MR. HOOTEN: Yes, this is Dave. I would view that as a relatively low priority.

MR. GEIER: Dave, we'll wait for your complete answer.

MR. MUNDY: We'll get back to you on that.

MR. GARCIA: And there's an action item on talking to legal requirement?

MR. TANEJA: I don't know if that's relevant anymore because I think what I'm hearing not really -- we probably did not -- we took it too far, I think that using a third-party certification idea.

MR. CURTIS: Yes, I think the questions that are being asked earlier are the key questions about who's going to take responsibility for certain aspects.

I think that you're correct. My understanding was certainly enhanced. There's some language specifically in Appendix C about NRC entrusting certification. That's where I think perhaps there may have been some hang up. So I think it goes to the same key issue of who is going to be responsible for what aspect.

MR. GEIER: I think Jonathan has listed questions he had are very appropriate and those are the types of things that we can --

MR. CURTIS: -- we need to explore.

MR. GEIER: Some of those will be answered by the EPRI research and some of those really are outside the EPRI research to really get to the process of utilizing those and then supply chain and vendor.

MR. CURTIS: I agree with Dinesh. I think it goes to your point earlier that public forgoes the conversation with legal at this time.

MR. MUNDY: I think that makes sense. Maybe it was going to happen anyway, but I think it would be helpful, Jonathan, you've got a number of good questions, comments, if it's appropriate to maybe put those in the notes or minutes or get them to us somehow so we make sure we address them and more clearly

understand, in-person is always good, but if you take the opportunity to jot those down that would be helpful.

MR. TANEJA: Keep them in a parking lot or something.

MR. TANEJA: When will the transcript be available?

MS. LAURON: The transcripts will be available to us to do a peer review to check spelling and some of the words, language in about three business days. But I expect like within a week if you go to the same meeting notice, it should be posted there. There will also be a summary. I can call up specific -- I have like three so far, other than Jonathan's questions. To be specific, one of them is an NRC action to confirm when the comment resolution table for reg guide 1292 will be available. That was a question.

Industry indicated that they would provide feedback and comments of the activities listed for potential inclusion in the next revision to the IAP, I guess some time in the next week or so.

And then Dinesh identified that the NRC should clarify its objective for the specific task and there was some questions about taking credit for the SIL with respect to commercial grade dedication activity.

And if we should still pursue guidance, etcetera.

So are the three things I listed so far. I can wrap those through to confirm that those are the right action items to include in the summary. You'll also have the transcript available on the site.

MR. GEIER: And in previous meetings, particularly with this whole digital I&C initiative is drafts, what works well is if you could provide the draft summary to us and then we can kind of review it and --

MS. LAURON: And confirm that I captured it correctly.

MR. GEIER: Yes, and maybe provide any additional things that we captured in our notes.

MS. LAURON: Sure. Certainly, I can provide that.

MR. GEIER: I'd also just ask because I'm not sure if Jonathan really got a chance to kind of go over all of his points that he's thinking of, but if you can capture some of those in a summary, that would be very helpful to us.

MR. MUNDY: Yes, sure.

MS. LAURON: Sure, sure. I can do that.

MR. GEIER: Great. Thank you.

MS. LAURON: So can we now open up the line

to members of the public or maybe we can start in the room. No, no questions from the member of the public in the room.

Angela, could you a poll of those who have called in if there are any questions for the group?

OPERATOR: If you'd like to ask a question, please press *1. One moment for the first question. The first question comes from Mark Burzynski. Your line is open.

MR. BURZYNSKI: Hello, this is Mark Burzynski. Can you hear me?

MS. LAURON: Yes.

MR. TANEJA: Yes, Mark.

MR. BURZYNSKI: Okay, I wanted to offer some comments on behalf of Company RADI. They have recently submitted a topic report for review and some elements of that topical report may be of interest to your effort.

First is that their platform was certified by Exida to a SIL 3 level using the IEC process. And that work was used in their commercial grade dedication in the same way that others may have used a critical design review of a product in making a decision to proceed with maybe a topical report.

I think the process, the topical report would also give you an opportunity to contrast what was done by Exida in looking at the development process versus what is done typically in the topical report for the NRC efforts so that you can kind of compare and contrast those two.

Another element of the certification process involved the preparation of an FMEDA and you can have a look at that and compare it to things that you may see in other contexts of an FMEDA and a hazards analysis. The FMEDA is a key part of getting the quantification of the SIL certification.

And the third aspect that would be interesting is the product safety manual that Dave Rahn mentioned. You can look at a product safety manual in the context of the application guide information that you typically see when somebody uses EPRI TR 107330 as the basis for preparing a topical report.

So you have an opportunity to compare and contrast some of those key things in your efforts for this project. Thank you.

MR. MUNDY: Thanks, Mark.

MR. RAHN: Thanks, Mark. That RADI report is now being reviewed by Richard Stattel of our office.

He's doing an acceptance review right now.

MR. TANEJA: Okay.

MR. BURZYNSKI: Yes, I just wanted to make you aware that there was some aspects of it that might be of interest to you from a laboratory setting so that you can learn more about what Exida is and now the SIL certification process works.

MR. TANEJA: So is that something that Matt could use in his research activity?

MR. RAHN: There's a proprietary --

MR. TANEJA: They would have to have to make it available to EPRI. I'm not saying that we would give it to EPRI, but if EPRI would get it through NEI or through Mark, then that's a different story.

MR. BURZYNSKI: I don't know. That's probably a discussion that happens outside of this one.

MR. TANEJA: Right.

MR. MUNDY: I think EPRI looks for examples. Maybe that's something that --

MR. TANEJA: All right, anything else?

MR. MUNDY: That was a challenge that Matt pointed out earlier is getting information from the data, the data holders.

MS. LAURON: Angela, is there another

person with a question?

OPERATOR: Yes, and this question comes from Ed. Your line is open.

MR. RENAUD: This is Ed Renaud from Westinghouse. Can you guys hear me?

MR. MUNDY: Yes, Ed.

MR. RENAUD: Okay, so I think I heard you say early in the meeting that there was going to be a transcript. Being on the line it was kind of difficult hearing some points of views and comments that was going on in the conversation. So can you reiterate when and where and how these transcript are going to be available to the NRC site? Could you elaborate, please?

MS. LAURON: Yes, so the meeting was noticed on the NRC public meeting notification website under November 3rd. So you look for my name or the title of this meeting. And in it there are related documents. Currently, there are four listed. After this meeting when the summary is available, after confirmation of information and confirmation of the details in the transcript, both will be posted as two separate links under that related document site.

If you have any issues after that, you can certainly email me and I can provide you the public ADAMS

link to those documents.

MR. RENAUD: Thank you very much.

MS. LAURON: You're welcome. Is there a third question, Angela?

OPERATOR: No further questions.

MS. LAURON: So are there any other final closing comments or remarks for the meeting? No, okay.

MR. GEIER: Thank you, great discussion and I think we've got this kicked off.

MR. TANEJA: On the next step, I think we need to probably get together and see when we want to meet after we go through the identification of the activities and then maybe what's the meaningful meeting that we can have to discuss our next steps.

MR. MUNDY: We may offer some opinion on that when we get back to you on the input on the schedule and clarification of objections, a holistic view of what we think could be nice to start the dialogue.

MR. TANEJA: Right.

MR. CURTIS: And you may have to include when you think you can support another meeting, that would be great, too.

MR. TANEJA: So my question is what's the criticality of this task to the industry compared to

some of these other tasks that are on the table right now?

MR. GEIER: I'll try to answer that. I think obviously moving forward on the CCF issue is really our number one and kind of right on its heels is getting alignment with 50.59. The whole idea here is as we kind of start moving forward with breaking some of these projects loose which is kind of the whole goal here is to get to the point that plants and nuclear plants, licensees are willing and capable to move forward with modifications that involve digital equipment with a better RIS profile, they're going to want to be able to take advantage of some of this information. But I think priority 3 is very appropriate. Still remains number 3.

MR. TANEJA: Still remains numbers 3.

MR. GEIER: Yes, and I think the schedule we've got laid out with activities is still kind of what we're looking for.

MR. CURTIS: So Dinesh, were you looking to making it closer to one or --

(Laughter.)

MR. RAHN: I have an opinion on that. The thing is, once we resolve CCF and 50.59, we're going to

want the answer to this question. So you can't let it go. It has to be worked on all this time while we're --

MR. TANEJA: Yes, that's what we got from the meeting yesterday that 50.59, that this one is very close to the other two.

MR. GEIER: And as we know, a lot of these, they're intertwined. So it's not like you solve those and this isn't -- I mean this is actually part of those discussions is commercial grade, utilization of commercial grade equipment in safety-related applications and how do we go about doing that in those arenas and so this is important.

MR. TANEJA: You know, just like the RIS that we issued on embedded devices, I mean really the digital devices and utilization whether we know it or not it's really becoming quite extensive. Even if you go out and place a circuit breaker, you don't know what you got in that. And maintaining the plant without digital is almost becoming impossible.

MR. MUNDY: It's limiting supply for sure.

MR. TANEJA: Right, right.

MR. GEIER: And what we want to get away from is not -- because of not having clear information,

aligned information on these, we don't want plants making we'll say kind of -- what's the word?

MR. MUNDY: All the digital decisions.

MR. GEIER: Yes, digital decisions or less than optimal decisions on their projects and try to go and either reverse engineer or come up with new analog solutions when clearly a digital solution is the best for the long term for these plants. That's really what we're trying to get to.

MR. TANEJA: Sounds good.

MS. LAURON: Before we adjourn the meeting, I just wanted to remind all the meeting participants that there's a feedback form on the public meeting site. We appreciate your feedback and certainly if it wasn't clear us coming through on the bridge line, we'd certainly appreciate your feedback on that. And with that, I close the meeting. Thank you.

(Whereupon, the above-entitled matter went off the record at 3:33 p.m.)