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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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SHINE SUBCOMMITTEE

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TUESDAY

JUNE 21, 2022

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The Subcommittee met via Video Teleconference, at 1:00 p.m. EDT, Ronald Ballinger, Chairman, presiding.

COMMITTEE MEMBERS:

RONALD G. BALLINGER, Chairman

VICKI M. BIER, Member

CHARLES H. BROWN, JR. Member

VESNA B. DIMITRIJEVIC, Member

GREGORY H. HALNON, Member

WALTER L. KIRCHNER, Member

JOSE MARCH-LEUBA, Member

DAVID A. PETTI, Member

JOY L. REMPE, Member

MATTHEW W. SUNSERI, Member

ACRS CONSULTANT:

DENNIS BLEY

KEN CZERWINSKI

STEVE SCHULTZ

DESIGNATED FEDERAL OFFICIAL:

CHRISTOPHER BROWN

ALSO PRESENT:

MARC ANDERSON, Sargent & Lundy

MICHAEL BALAZIK, NRR

JEFFREY BARTELME, SHINE

JOSH BORROMEO, UNPL Branch Chief, NRR

CATHERINE KOLB, SHINE

ANDREW PRINARIS, NRR

TRACY RADEL, SHINE

ROGER THOMAS, SHINE

GLENN TUTTLE, NMSS

AGENDA

P R O C E E D I N G S

(1:00 p.m.

CHAIR BALLINGER: The meeting will now come to order. This is a meeting of the SHINE Subcommittee of the Advisory Committee on Reactor Safeguards.

I am Ron Ballinger, Chairman of today's subcommittee meeting. ACRS members in attendance are Charlie Brown -- let's see. I'll go right from here. Matt Sunseri, Jose March-Leuba, Walt Kirchner. Who else did I -- Vesna Dimitrijevic. Who did I miss? Well, if I missed somebody, please say something. Oh, Vicki Bier. Excuse me. She was sitting right here for crying out loud. We have our consultants, Steve Schultz and --

MEMBER REMPE: Member Ballinger, you forgot the left side of the table.

CHAIR BALLINGER: Oh, Dave Petti, Joy Rempe. I was taken over by the aura. We now have consultant Ken Czerwinski here for the first time.

During today's meeting, the subcommittee will have discussion with the NRC staff and SHINE Medical Isotopes addressing technical issues identified in our memorandums for Chapters 3, 4, 8, 9, 11, 12.7, 12.13, and 13.

Part of the presentations for the Applicant and the NRC staff may be closed in order to discuss information that is proprietary to the licensee and his contractors pursuant to 5 USC 552b(c)(4). Attendance at the meeting that deals with such information will be limited to the NRC staff and its consultants, SHINE, and those individuals and organizations who have entered into an appropriate confidentiality agreement with them.

Consequently, we need to confirm when we get, when we do the closed meeting, if we have one, that we have only eligible observers and participants at those meetings.

The rules for participation at all ACRS meetings, including today's, were announced in the Federal Register on June 13, 2019. The ACRS section of the U.S. NRC public website provides our charter, bylaws, agendas, letter reports, and full transcripts of all full and subcommittee meetings, including slides presented there. The meeting notice and agenda for this meeting were proposed there. We have received no written statements or requests to make an oral statement from the public.

The subcommittee will gather information, analyze relevant issues and facts, and formulate

proposed positions and actions as appropriate for deliberation by the full committee. The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register.

Today's meeting is a hybrid meeting held in person or over Teams. The telephone bridge line allowing participation of the public over their computer using Teams or by phone was made available. Additionally, we have made a Teams link available on the published agenda. This will be the same length for the, for other meetings.

Okay. A transcript of the meeting is being kept. Therefore, we request that meeting participants and Teams, on Teams and on the Teams call-in line identify themselves when they speak and to speak with sufficient clarity and volume so that they can be readily heard. Likewise, we request that meeting participants keep their computer and/or telephone lines mute when not speaking to minimize disruptions. The chat feature on the Teams should not be used for any technical exchanges.

Before we get going and introduce Josh for an introductory statement, for my purpose, the purpose of this meeting is to get closure on those chapters.

So, during our review of those chapters that I mentioned earlier, in our memos we identified potential areas that needed maybe a little bit further discussion, issues that needed to be clarified, or other issues like that. The staff and the Applicant has these memos.

And so hopefully the result of this meeting will be what I would call closure on those chapters. Closure either, to me, means either actual closure or maybe we identify something that just we can't get closure on. But that's where I'm going from this meeting.

Now, are there other members that have comments that they'd like to make related to this? Hearing none, thank you. So I'll now turn it over to Josh. And I think SHINE's going to start first, right?

MR. BORROMEO: Yeah, yeah, SHINE's going to start first. But, you know, my name is Josh Borromeo. I'm Chief of the Non-Power Production and Utilization Facility, Licensing Branch. And I appreciate ACRS's continued timely review of the SHINE operating license.

And as Professor Ballinger said, you know, we hope the combination of the discussions today and

some of the documents that we have uploaded are going to, you know, get us to closure, at least clarity, on the dozen or so questions and concerns from the previous engagements that we've had.

To us, the two I'll call more significant items are the seismic margin discussion, as well as the system actuation timing table. So those we'll probably go into a little bit more depth when we get to those areas. And we'll be leading with the seismic discussion today.

And again, I want to thank ACRS for their time and the staff and SHINE for their continued efforts on this project. So with that, I'll turn it over to SHINE.

CHAIR BALLINGER: Is SHINE on?

MR. BARTELME: Thanks, Josh. So we've got sort of the summary concerns issue document that was put together coming from the individual chapter memos. We just kind of wanted to go through each chapter and make sure each open items are identified if it was a SHINE issue or staff issue and see if we can't reach closure on each of these. Because of availability of --

MEMBER REMPE: Excuse me for just a second.

CHAIR BALLINGER: Yeah, we're very garbled here.

MEMBER REMPE: Yeah, we need more volume or you need to get closer to the mic. I'm Joy Rempe, and I'm in the room. And we're having trouble hearing you.

MR. BARTELME: All right. Thanks. Is that any better?

MEMBER REMPE: Not enough. Maybe we're trying to do some stuff here in the room, too, hold on, and maybe that will solve it. Sorry to interrupt you. But we need to do it now rather than later. Okay. Try again, please.

MR. BARTELME: Can you guys hear me all right now? Is it less garbled?

MEMBER REMPE: That's much better. Thank you.

MR. BARTELME: Okay. So we've got the summary documents kind of with the concerns or issues from each memo. We just wanted to work through chapter by chapter. Because of, you know, availability of the folks supporting SHINE on these requests that we start with Chapter 3 first and then move to a discussion on the Chapter 8 items if we could.

CHAIR BALLINGER: This is Ron Ballinger. Can the court reporter hear us okay? Oh, good, because we have no slides for this meeting. And so that's, the transcript is going to be the record. And so it's important that while we might not be able to hear people well enough, you do. Thanks. Okay. Let's go.

MR. BARTELME: Okay. So, if we could start with some of the actual items under the Chapter 3, coming from the Chapter 3 memo related to a basis for the 25 percent margin in the seismic gap, we've got Marc Anderson from Sargent & Lundy here to support SHINE. And he can provide additional discussion on the basis for the seismic gap and the structural evaluations SHINE has performed. So, Marc, if you could, please.

MR. ANDERSON: Sure. Thanks, Jeff. My name is Marc Anderson from Sargent & Lundy.

So, just to follow on this item from our previous discussion, you know, as we stated there as a safety related portion of the facility and a non-safety related portion of the facility, the safety related portion of the facility has been designed for the SSE earthquake event. We did a very detailed analysis, soil structure interaction analysis using

NUREG 0800 Section 371 and Reg Guide 161 input directly from the NRC. And we generated an in-structure response spectra.

And essentially, in the analysis of the facility, we did a few different types of seismic analyses to determine what would control the building design. And for deflections, we used an equivalent static model. And we determined deflections at the roof elevation of the facility, which is the highest elevation. And we considered that to be controlling.

Additionally, we calculated deflections for the what I'll call the admin annex or the non-safety related portion of the facility according to the design basis for that facility. And we ensured that the seismic gap between the two facilities was large enough to accommodate the two deflections assuming that they were added together.

Separately, we looked at what would happen if there happened to be some interaction, if say the non-safety related building were to experience the larger earthquake that the safety related facility is required to be designed for. We looked at what would happen if the non-safety related building were to come into contact with the safety related building.

And we determined that the safety related

building is designed for the aircraft impact analysis and the energy associated with that. And the energy associated with that is significantly larger than the energy that it would see if the non-safety related building were to collapse or fall into or bump into the safety related facility in this earthquake event.

CHAIR BALLINGER: So this is Ron Ballinger. So what you're saying is that the aircraft impact deflection, if you will, dominates.

MR. ANDERSON: No, I'm sorry. Let me clarify a little bit further.

So the seismic gap that we had described in the previous meeting is sized based on the various earthquake events that the two buildings are licensed to be designed for. All right. So the safety related facility is designed for this SSE event. And we've determined deflections as a result of that SSE event and the seismic gap appropriately.

Separately from sizing this seismic gap in a way that we felt had enough margin to avoid any interaction between the two facilities, we said, well, what if the non-safety related building did come into contact with the safety related building during this SSE earthquake event. And we did evaluate that scenario.

And we determined that the energy that the safety related building is designed for as a result of the aircraft impact event is higher than the energy that the safety related building would need to be designed for if the non-safety related building were to fall into the safety related building or to come in contact with it.

So it's not that the deflections for the earthquake, or excuse me, for the aircraft impact controlled. It's that the design of the safety related facility is such that there would be no negative effects if the non-safety related building were to come in contact with it. Its design is bounded by the aircraft impact.

CHAIR BALLINGER: Okay. So where do we get to the 25 percent?

MR. ANDERSON: So the 25 percent margin is, or approximately 25 percent margin is what remains of the distance between the two facilities when you add the deflection of the safety related building to the deflection of the non-safety related building.

MEMBER PETTI: So, in absolute terms, what is that distance?

MR. ANDERSON: I want to make sure I have the right numbers in front of me.

MEMBER PETTI: Sure.

MR. ANDERSON: One second. The seismic gap is sized at one inch. The largest deflections of the safety related facility are, at the highest elevation are .35 inches. And that's as a result of the SSE earthquake event.

MEMBER PETTI: And that's at the top.

MR. ANDERSON: And that's at the top of the building. And then we determined deflections at a few different areas of the non-safety related building, because there's a couple different elevations.

And those deflections are, at one elevation, at the highest roof of the non-safety related building, which is approximately five feet lower than the highest roof of the safety related building, the maximum deflection is .34 inches. And that deflection is actually a result of wind loading. We conservatively considered the wind loading in conjunction with the SSE earthquake just because, you know, we wanted to make sure there was a conservative design.

There is a lower roof elevation on a different side of the building that we checked for deflections. The maximum deflections as a result of

the earthquake event at that roof are .45 inches, so that ends up controlling.

So, when you add the .45 to the, .45 for the non-safety related building to the .35 for the safety related building, you actually get about .8 inches. So the margin is -- and I'm rounding up the numbers here. So the margin is a little more than 20 percent between those two buildings.

CHAIR BALLINGER: Okay. So I guess Dennis Bley, who is a consultant, that asked the question during one of the previous meetings is not here, is not with us today. So I'm trying to be very clear in the transcript so that when he reads it he'll see it. But where does the 25 percent come from? Who decided that it needed to be 25 percent, or what decided that it needed to be 25 percent?

MR. ANDERSON: There was no --

CHAIR BALLINGER: Oh, oh, okay. Dennis just came on. So he can ask the question more directly.

MR. ANDERSON: Sure.

CHAIR BALLINGER: Dennis, are you there?

DR. BLEY: Yeah. Sorry. I just arrived. And I take it you're talking about what we asked about. Was there any answer? I don't see any slides

or anything up here.

CHAIR BALLINGER: Yeah, there are no slides for this meeting. And we just went through -- and I'm not sure that we, that some of these numbers might not be proprietary, but apparently they're not, the numbers for the actual deflections. But my question was still, where did the 25 percent come from? How did you decide it was 25 percent?

DR. BLEY: Yeah, there were two related things. One was where did it come from and how confident are we that that covers all you need to cover.

And the second thing was if you didn't really look beyond the design-basis event, do we have any confidence that we're not sitting on the edge of a cliff. And even if everything was calculated perfectly, the methods you used to calculate this leaves about a 15, 20 percent chance that we'll get an earthquake greater than the DBE at least in some of the parameters.

So the question was, are we sitting on a cliff? If we get a little bit bigger earthquake than we planned on, do we have a serious problem or not? And part of that, that all has to do with the uncertainties in the calculation. So --

MR. ANDERSON: Sure. So there's two things. So the first thing is sort of the acceptance criteria question. Who decided that the 25 percent was sufficient? And the acceptance criteria is that the seismic gap is simply larger than the calculated maximum deflections, which we believe to be conservatively calculated. That just happens to be the margin, approximately, you know, 20 to 25 percent in the gap.

The second question is do we have any concerns. You know, if the margin is 20 to 25 percent, then is there a concern that if we see an earthquake event that happens to go slightly above the DBE, are we, you know, will we run into issues? And I was trying to address that earlier. It seems like my explanation may not be entirely clear. So let me try to explain it again.

The safety related facility is designed for this aircraft impact event. And I keep bringing it up. I know it's separate from the SSE earthquake. But it's related in this way. It has to do with a pretty large mass traveling at a high velocity creating a large impact energy. And similarly, you know, if this non-safety related building were to start shaking an earthquake event and were to impact

the safety related facility in some way, it would have a similar type of dynamic energy effect.

And so what we've done is we've looked at what happens if the non-safety related facility does eat into that seismic gap margin and potentially either bump into the safety related facility or even collapse into it, does that cause a problem.

And what we concluded is that the earthquake, or excuse me, the aircraft impact energy that the building was designed for is significantly larger than the energy it would see if the non-safety related building were to collapse into it. And that's how we justified it.

DR. BLEY: I have to think about that. I mean, you're looking at -- generally when you do the aircraft impact analysis, you're looking at some very dense part of the aircraft penetrating into particular areas of the facility. And here we're looking at kind of the general effect over the building being moved.

And your argument might stick together pretty well. But I have to think about that some. And I don't think we have any details to look at to let us understand this better. I don't know.

I'm not even sure who I'm talking to. I apologize, because I was late. I had a medical

appointment this morning. And I just got back. So you're with SHINE?

MR. ANDERSON: My name is Marc Anderson. I'm the structural engineering manager with Sargent & Lundy. And SHINE has contracted us to design the facility and perform these analyses. So Jeff asked me to be on the call today to discuss these issues.

DR. BLEY: Okay. And you are fairly convinced that an earthquake a little bigger than the SSE if it either can't lead to an impact on that building or if it does it's not going to be, cause significant damage. I think that's what I heard you say. And it's based on an analogy to the aircraft impact analysis.

MR. ANDERSON: That's correct. Yeah. Now, for the aircraft impact, you know, as you know, we analyzed the building for two sort of separate failure modes. One is a local impact where we consider a fairly dense portion of the aircraft to see whether or not it penetrates any aspect of the building.

And then second is the global effects. So we check what happens to the entire building or, you know, the portion of the building that the aircraft strikes, what happens as the load distributes through

the building.

And, you know, we derive an energy based on the mass and velocity of the aircraft. And we can similarly derive an energy from the non-safety related building based on these peak spectral velocities associated with the SSE and the mass of the building and conclude that the aircraft impact energy is significantly larger.

DR. BLEY: And the step beyond that is it doesn't cause any significant damage.

MR. ANDERSON: That's correct.

DR. BLEY: I'm assuming that like most aircraft impact analyses I've seen this is in some manner restricted information. I'm not -- I'm pretty sure, well, I know I haven't seen any of it. Is it available for the ACRS to look at, or has the staff looked and inspected it and examined it?

MR. BARTELME: This is Jeff Bartelme from SHINE. I'd have to look, but I do believe it has been made available to the staff via our NRC Reading Room. But we've not placed it on Box for the ACRS members to view.

DR. BLEY: Okay. Is --

CHAIR BALLINGER: This is Ron. So should we request that it be put on the Box?

DR. BLEY: Well, I would like to hear from the staff, if the staff has heard this argument, if they've heard it before or just now for the first time and their opinion of it, because I would hope they've looked at the analysis that's being discussed here.

CHAIR BALLINGER: Should we save that for the staff, or has the staff got an answer now?

MR. BALAZIK: This is Mike Balazik, NRC staff. Andrew, is this something we can respond to now, or is this something we need to address a little bit later?

MR. PRINARIS: Mike, we can address it right now. It is my understanding, it is my clear understanding that the aircraft impact since the PSAR has not been really modified by much and probably not at all, and certainly a letter can confirm this.

So, and we did look, as Mr. Anderson said, that there is a local and a global impact. And there is an RAI to this effect. But the analysis, the aircraft, the earthquake analysis and the aircraft impact analysis are related. So I'm not so sure if ACRS had the opportunity to look at these RAIs.

But the numbers that Mr. Anderson provided at least for the safety related building I do recall that number reading in the analysis. And what you

have is obviously a non-safety related, probably a monitoring building, to the best of my recollection, and a shear wall building. And the shear wall building is the one that is going to absorb the aircraft impact. And that's what Mr. Anderson I believe is relating. Is that adequate to ACRS?

DR. BLEY: I can't tell you right now. I guess, Ron, if we can get a look at the global analysis and have a chance to think about it, it would be helpful, because --

MR. PRINARIS: I think if you go to, to the best of my recollection, again, to the PSAR ADAMS accession numbers, I believe, to the best of my understanding again, that PSAR aircraft analysis hasn't changed by much.

CHAIR BALLINGER: So I guess, this is Ron again, in order to get closure on this, can we work through Chris and get whatever we need to get this done?

MR. BALAZIK: This is Mike Balazik, NRC staff. Yeah, we can work with SHINE to get up the analysis into Box for Dr. Bley to look at.

CHAIR BALLINGER: Okay.

MEMBER REMPE: It sounds like --

MR. BARTELME: Yeah, this is Jeff Bartelme

from SHINE. We'll get a copy of the aircraft impact evaluation on Box for your reading.

MEMBER REMPE: It sounds like there is an RAI and a response from SHINE, too, that would be helpful. Is that true? And if so, could we have access to that, which doesn't require the Box?

MR. BALAZIK: This is Mike Balazik, NRC staff. Yes, I will find that RAI. And I can send that over to Chris.

CHAIR BALLINGER: Okay. So the way I look at we have two possible paths. One is look at the RAI, and the other is put stuff in the Box to be, for Dennis to look at. And it's probably not a bad idea to take both paths.

DR. BLEY: I think that's right. And then I think the committee needs to have a little discussion about it. This is, I mean, it's kind of a back door way to address the issue. But maybe it's pretty reasonable. I'm not positive yet.

MR. PRINARIS: This is Andrew Prinaris from the staff. So I'm trying to understand what ACRS is looking for. You're looking for a seismic acceleration exceeding the design requirements.

DR. BLEY: Well, we're not looking for it. We're worried there could be one. And actually by the

way you design these things, the chance that you have something somewhat above the design is not negligible. It's a pretty substantial chance. And the question was are we confident that we don't have any significant problems if we go a little beyond that. And --

MR. PRINARIS: So what they're looking is for a seismic event beyond the design-basis event.

DR. BLEY: Well, that's what we're thinking about. And to look at your global analysis, and usually I've only seen the other ones where you're looking into the penetrating aspects of the aircraft crash, this sounds kind of reasonable to me. But since I haven't seen anybody do it this way before, I probably want to take a look.

MR. PRINARIS: Sure. I was just trying to understand, you know, what is the driving force to go beyond design-basis events.

DR. BLEY: Well, the driving force is -- well, the easiest place to point you to is when the Mineral earthquake occurred, it turned out that some of the parameters were above the design basis. And everybody got a little excited about that.

And then the utility and the designers met with the Commission and explained that, yeah, the way

this analysis is done there's about a 15 percent chance that an earthquake bigger than the design basis will occur. And to me that's not a negligible chance.

And the related question is usually, and people looked at this a lot 30, 40 years ago, the worry was, gee, if we, is there a cliff at the design basis earthquake. If we go a little beyond that, does the plant fall apart? Do we get in serious trouble?

And for almost all aspects of the design, the answer has always been no, it's kind of a gentle degradation as you go beyond there, with the exception of a few design issues associated with buildings.

And one of those that came up and led to a change was the case where two buildings could bump into each other. And that looked like it could lead to substantial damage. And it ended up leading to a change in the design, a modification to absorb that energy without causing problems.

So, you know, if we had done a seismic PRA, we would know for sure whether there was a cliff edge here and we were getting into trouble. We haven't done that.

So, to make sure we don't have a real problem if we go a little beyond where we're designed, we saw these buildings were close together, wondered

how close they were and what the margin was and how that was decided and if that was enough to make sure we wouldn't have any impact.

The way SHINE described it today, maybe, maybe not, but that you would get some impact in the global aircraft crash, and that looked like it would be more severe than an earthquake a little beyond the design basis. It might be a very reasonable argument. But we haven't seen any details of it. And that's all I'm asking for.

DR. SCHULTZ: Marc, this is Steve Schultz. I've got a question that goes back to the portion of the presentation you made before Dennis joined. And that is when you were describing the evaluation and analysis of the gap and its margin, you said that for the non-seismic related building you had assumed a wind loading, a high wind loading along with the seismic event. How much margin would there be if you took out that high wind loading?

MR. ANDERSON: For that portion of the facility, the wind loading is -- let's see. So the seismic deflection at that portion of the facility is .18 inches instead of the .34 inches associated with the wind loading. So the margin would increase to about 50 percent probably, something like that.

DR. BLEY: Oh, I missed that. Thanks, Steve, for pointing that out. That sounds --

DR. SCHULTZ: They assumed it was coincident, the wind loading and the seismic event.

DR. BLEY: And that's pretty, very unlikely. So --

DR. SCHULTZ: That's why I brought it up.

DR. BLEY: Yeah. Okay. Thank you.

DR. SCHULTZ: I didn't expect it to be that large. So, anyway, I agree with you, Dennis. It would be nice to have these things lined up and have the ability to see what would happen if one assumed a slightly higher seismic loading would occur and what likelihood that was.

CHAIR BALLINGER: But, in effect, taking away the wind loading --

DR. SCHULTZ: It seems like it.

CHAIR BALLINGER: Yeah, that's what it does.

DR. SCHULTZ: It provides some substantial margin.

CHAIR BALLINGER: Yeah.

DR. BLEY: That helps a lot. But I think I'd still like to take a look at that global analysis.

DR. SCHULTZ: I would, too.

DR. BLEY: Yeah.

CHAIR BALLINGER: Okay. So are we clear on the path for this, the RAIs and the Box? Does that satisfy everybody?

MR. BALAZIK: Yeah, this is Mike Balazik. Yes, we're clear on the path and the RAIs and the global response on the Box.

CHAIR BALLINGER: Great. Okay. So are we okay with this discussion on this topic?

MEMBER BROWN: Where are we going?

DR. BLEY: Yeah. Thanks, Ron.

CHAIR BALLINGER: Answer yes.

MEMBER BROWN: I just wanted to make sure we understood that it was not, the path is undetermined --

CHAIR BALLINGER: No, I think --

MEMBER BROWN: -- because that's what I took away from this, the discussion. They made their points. But what's going to be done in response to those --

CHAIR BALLINGER: They're going to provide RAIs related to the analysis, as well as --

MEMBER BROWN: They're going to add, they're going to provide additional --

CHAIR BALLINGER: Yeah.

MEMBER BROWN: -- documentation.

CHAIR BALLINGER: Yeah.

MEMBER BROWN: That works.

CHAIR BALLINGER: And then --

MEMBER BROWN: I didn't -- that kind of spun right past me. Sorry about that.

CHAIR BALLINGER: Okay, okay. Okay. That actually was a pretty good discussion come to think of it. Okay. I'm not -- what's next?

MR. BALAZIK: This is Mike Balazik, NRC staff. The next item we'd like to talk about is Chapter 8. There was a concern related to the 180-second time delay, that the target solution stays in the TSV after a loop. And there were also some additional input from Member Brown.

Jeff, do you want to start with talking about the 180-second time delay?

MR. BARTELME: Sure. And Catherine's going to lead the response on that particular concern or issue.

MS. KOLB: Yeah, this is Catherine Kolb, Senior Director of Plant Operations. The concern from before was does the 180-second delay matter, you know, was there anything that the operators could do in the 180 seconds that would make it be a reasonable delay

from an operational sense. And we believe yes, it is. So, if there was a momentary loss of offsite power from the grid, only the two main breakers would open, presumably on under voltage, but they trip on a variety of things --

MEMBER MARCH-LEUBA: This is Jose. Can you speak slower and a little maybe further? You guys have a terrible microphone. I can hardly understand what you're saying. And this is continuously always the same. Please speak more clearly, at least slower. Okay? Okay.

MS. KOLB: Okay. We're switching our microphone. Hold on.

CHAIR BALLINGER: And there's kind of an echo a little.

MS. KOLB: Is this --

MEMBER MARCH-LEUBA: This is consistent. The SHINE microphone is terrible. I mean, pick up the handset --

DR. BLEY: It's much, this is much better.

MS. KOLB: Okay. Good. So I apologize. So the concern from before was did the 180-second delay matter, could an operator do anything in that 180 seconds that would make it worthwhile for including it in the design. And we believe yes.

So, on a loss of offsite power, the two main breakers would open, presumably on under voltage but could open on other things. If the grid was restored, if this was a momentary transient or a couple second transient, the control room operators would have knowledge of the voltage available. And they would be able to reclose those two breakers.

Those two breakers are controlled using our process integrated control system, the PICS, that they can operate from the control room. So they wouldn't need to dispatch anyone to the field or anything in order to take advantage of the 180-second delay and restart the process cooling water, or process closed loop cooling system, the PCLS, in order to recover.

MEMBER MARCH-LEUBA: And this is Jose again. And this is the only action they're supposed to take, to close the breakers for the pumps, or do they have to recognize -- well, obviously, they have to recognize the high voltage. But do they have to recognize any valve alignments or any other things?

MS. KOLB: No, the valves are not expected to change states. In response to this, the -- if it doesn't restart, the worst thing that would happen is the 180 seconds would time out and it would, an IU

cell safety actuation would occur as designed.

So, yes, if power was off for a long time, you know, 2 minutes and 59 seconds, then, yeah, there would be nothing they could do. But if it was momentary, we believe 180 seconds would be sufficient to recognize that this had been restored, close the two breakers, restore PCLS. And then they would have sufficient time to restart the neutron drivers in order to resume operation. And they wouldn't be bound by any time limits at that point.

MEMBER MARCH-LEUBA: And the only reason we dump all the TSV solution from the TSV tank, is it because it cannot, the TSV tank cannot reject decay heat without active cooling and it needs to be dumped into the dump tank where it can possibly cool, correct?

MS. RADEL: So, this is Tracy Radel, SHINE's VP of Engineering. The system has been evaluated for the thermal hydraulics of leaving it in there for three minutes.

It is correct what you stated, that the heat transfer through the PCLS and into the pool water from the target solution Bessel would not be sufficient to keep it in there long-term, with the amount of decay heat that's going on.

So, we've determined without heat transfer out, it's fine for the three minutes, and then, we transfer to the dump tank. And within the dump tank there is enough surface area and cooling capability from the light water pool.

MEMBER MARCH-LEUBA: Yeah, let me see if I can express it in the way I think about it, and you tell me if I'm correct or not.

I think that this dumping of the TSB solution is not a reactor protection system function, but an emergency core cooling system function. It's equivalent to turning the ECCS pumps in an operating reactor. So, it's a long-term decay heel removal issue. Is that correct?

MS. RADEL: That is correct.

MEMBER MARCH-LEUBA: Yeah. And on operating reactors, ECCS sometimes doesn't even come on. And all time -- every single occasion -- they come with a significant delay. So, this is not inconsistent with operating reactors. That's the way I see it.

CHAIR BALLINGER: Okay, thank you.

MEMBER DIMITRIJEVIC: Okay, well, this is Vesna Dimitrijevic. I look on this from a slightly different perspective. So, let me ask you again,

which of the two, on the loss of offsite power, which breakers open automatically? The breakers to which buses?

Because -- okay, so I'm going back to the breakers, and I will get back to thermal hydraulic. You said that the loss of offsite power, he only has to close two breakers to de-energize buses. Which are those two breakers?

MR. BARTELME: Those are the main breakers for services A and services B into the building.

MEMBER DIMITRIJEVIC: Okay, so those are the only two breakers, the UP breaker 1 and UP breaker 2, that open on loss of offsite power, right?

MR. BARTELME: Correct, for the building. There's are the UP breaker 3 and 4 out at the chiller farm, for the chillers. Those also would be very similar. Those also would need to be reset.

MEMBER DIMITRIJEVIC: Okay. So they will automatically, just as loss of the power, they will automatically open. Now, let's say that you get power very fast, in the matter of seconds. That will be procedure, right? Telling the operators to close those breakers. Right?

MS. KOLB: Yes.

MEMBER DIMITRIJEVIC: But then, before he

closes these breakers, he has to check the loads also disconnected. Right? He's not going to close breakers on loaded buses, right?

MR. THOMAS: No. The system is designed -- I'm sorry, this is Roger Thomas, Lead Electrical Engineer for SHINE.

MEMBER DIMITRIJEVIC: Right.

MR. THOMAS: So, they would be closing, on a momentary thing like that, into load. Now, a lot of those loads will close themselves off. Major loads like the chillers and stuff have their own restart cycles. So, you have substantially reduced load of the auxiliary systems.

MEMBER DIMITRIJEVIC: Okay, so in your visualization, if he wants to get back the primary cooling, so he will first check the status of the loads, close those two breakers, and then has to go and close the breakers on the primary cooling pumps. Right?

MR. THOMAS: No, those would still be in the original state. They would have --

MEMBER DIMITRIJEVIC: So, you mean the pumps will just automatically load on the buses?

MR. THOMAS: Correct. They would stay in the same state. They are on VFDs, so there would be

a soft start to them. But they would restart on return of the power.

MEMBER DIMITRIJEVIC: Well, that's a very -- well, at the same time you are loading, in the loss of power, your standby generator will start loading. Right? So, which will assume also that you are disconnecting loads before your load your standby generator.

So, I mean, when you guys thought about these three, did you went through this procedure what operator actually have to do to get those pumps back running?

MS. KOLB: We looked at the design. The (unintelligible) procedure is still in draft.

MEMBER DIMITRIJEVIC: I understand that. But I just want to say, because what is happening in the loss of offsite power event is really sort of like complicated scenario, where you have your standby generator loading.

You have to think about this off-gas system, nitrogen purge. There's so many different timings there. So, I just want to see if anybody brought the timeline, and had to visualize picture, how would that work from procedure? That's one of my concerns.

Because I couldn't see nearly all of this working out and happening in three minutes.

MEMBER BROWN: Vesna, can I inject something. This is Charles.

MEMBER DIMITRIJEVIC: Sure. Sure.

MEMBER BROWN: When you lose offsite power from Alliant, theoretically, our SGS starts and the breakers, like you say, UP breaker 1 and 2 trip open, as well as 3 and 4, but now your SGS is on, so your buses are being supplied from another generator.

So, it's more complicated than just having those breakers come back. And they can't automatically do anything until you synchronize them and transfer load.

MEMBER DIMITRIJEVIC: Right.

MEMBER BROWN: Unless you de-energize everything first, and then reapply the Alliant power. So, this is a more complicated layout and was one of the reasons for my questions about how these breakers are interlocked.

Well, it's to the DC loads, which are picked up and are still running, theoretically. So, this is not as straightforward as it sounds. And there's no discussion of restart and how loads behave in the description.

So, that's one of the questions I asked. We didn't explicitly cover that, although it's implied in one of my comments, relative to safe shutdown and loss of offsite power.

So, it's a little more complicated if you've got -- you just can't apply Alliant power back once you've got all those other AC loads running on the SGS.

Even if it's a momentary loss of Alliant, there's no discussion of -- is there a time delay before the SGS starts? Does it wait for two minutes or one minute?

Well, you've got to be careful, because you're stripping loads down in the rest of the plant. There's three- and five-minute walkaway load strip situation.

It just seems to me this ought to be enumerated or explained a little bit more than the discussion.

MEMBER DIMITRIJEVIC: But based on the analysis, ATS starts loading within one minute, and finish transfer in five minutes. That's what the assumptions around loss of offsite power.

So, basically, you see what we are sort of asking in cooling nuclear plans. That is, the cavity

of offsite power is always credited, and it could be in different time frames.

Unfortunately, usually there is no operator action associated with that. These operator actions can be complicated. And we didn't really learn too much about that through the operating plants. So, this is what was our concern, because it happened here, it has to be done within three minutes, and it didn't really seem -- so, my question for your thermal hydraulic catalyzer, so this is your maximum -- I know Jose looked like, in your thermal hydraulic catalyzer said -- I did too conclude that that would not be boiling in three minutes.

But what is your maximum time frame before you have to dump? Is it three minutes? Or would that be a boiling in four minutes?

MS. RADEL: So, this is Tracy again. The analysis is very simplified and has quite a bit of margin in it. We did not define an exact amount of time it could go beyond that.

We didn't calculate it out to what the maximum time was. It was a calculation to confirm that three minutes was safe and the safety system will open the valves at that point and drain the solution.

So, we don't have a number on the amount

of time that it could potentially stay within the unit.

The other aspect of that analysis is assumed to start at the high-temperature limit of the solution at the start of that analysis, versus an actual expected temperature of the solution. So, there's significant margin in there as well. But we haven't defined a specific time.

DR. BLEY: Aren't you depending upon those three-minute and five-minute load-stripping evolutions to actually be accomplished though, to meet this walkaway situation?

MS. RADEL: The three-minute opening of the dump valves is within the safety system. So, the safety system will initiate an IU cell safety actuation after three minutes of having lost the PCLS flow, and open those valves. And that is going to happen whether or not there's power, or whatever is happening within the facilities.

DR. BLEY: So, if the three-minute time delay does not strip, you're saying the safety system will take action anyway. That's what I got out of your discussion.

MS. RADEL: Yeah, so it's not related to the load-stripping at all off of the UPSS. These are

actuated by the safety system.

DR. BLEY: One of my comments that we haven't gotten to yet but it's relevant to this discussion, was you're talking about a safe-shutdown configuration at which you arrive under these circumstances, and you called it walkaway.

And what you've gone through in this discussion is a more complex iteration of what's going on. And all I was looking for, relative to my last bullet, was what's the definition, and what has to occur to accomplish that safe-shutdown configuration?

In other words, write it down inside whichever the appropriate document is, whether it's chapter 8 or not. Because you didn't define explicitly what that configuration was, other than orally. So, I'm just throwing that in --

(Simultaneous speaking.)

DR. BLEY: Excuse me, Vesna. Go ahead.

MEMBER DIMITRIJEVIC: Yeah. Are you planning to address -- okay, so this is a separated. So, this loss of the primary water flow, and it's in the pattern of your stripping and the time requirements, table 88221.

So, are you planning now to address Charlie's concerns?

MS. KOLB: Before we go into this -- this is Catherine Kolb. We do define safe-shutdown in our proposed technical specifications. That should be where we define that term.

And then, just to clarify, I think some of the complication of this discussion we've been having is because we were postulating on how we would recover after a loss of offsite power. A momentary one that then returns.

Yes, that does become more complicated than the safe-shutdown condition, which you wouldn't be attempting this, because we -- and this is essentially what we're attempting to operate again, versus getting to not operating, if that makes sense.

MEMBER BROWN: I would suggest that burying -- that's the wrong word -- incorporating the safe-shutdown condition definition in the tech specs is somewhat obscure.

And yet, you can talk about how you need to accomplish that in not only this chapter, but others. But it seems to me it ought not be just limited to that, unless you want to reference it somehow in chapter eight or the other chapters that are necessary.

That's just an obscure reference and

assumes somebody's read though every one of the tech specs to figure out what that is. So, just a suggestion.

MEMBER DIMITRIJEVIC: Well, we were so far discussing one of those things expressing concerns. But there is also additional comments by Charlie. Is the SHINE ready to discuss those one-by-one? Or you are just planning to discuss this three-minute?

MR. BARTELME: We're also prepared to discuss Member Brown's recommendations as well. And we can move on to those now if we're ready to sort of move on.

MEMBER DIMITRIJEVIC: Okay. All right, that's fine. That's what I wanted to hear and I'm thinking about that. Can you please go through Charlie's comments now.

MEMBER MARCH-LEUBA: Can we stay on this topic for another two minutes?

MR. BARTELME: Sure.

MEMBER MARCH-LEUBA: Yeah. If I understand correctly -- this is a question for SHINE -- (audio interference) .7-4, which ostensibly shows the TSV solution temperature as function of time following a loss of power.

If I read that correctly, the culmination

of the 180-second time delay, the temperature, the TSV, raises but a couple of degrees Celsius. Am I reading correctly? I don't know if you have access to those figures.

MS. RADEL: Yes, that is correct.

MEMBER MARCH-LEUBA: Yeah, so the dotted-blue line, if the initial temperature, which is -- and this is non-proprietary, because it comes from the FSAR -- is 87 degrees, and the yellow line is the 182nd. It reaches like 88. Like, it only heats up like one degree C over 180 seconds.

But when I finally understood what this figure meant, that 180 second was of no safety significance. As long as you dump it, you're not overheating. The power density's so small.

So, from the thermohydraulic point of view, I don't see any problem. That was my conclusion.

MS. RADEL: So, I just want to clarify and walk through the figure and make sure we're understanding the same things here.

So, the figure is showing the temperature profile --

MEMBER DIMITRIJEVIC: Why is this picture is not proprietary?

MS. RADEL: Oh.

MEMBER DIMITRIJEVIC: Because I also have the problem understanding this when I was looking at that.

MS. RADEL: Yes, so I'll share a screen here.

MEMBER MARCH-LEUBA: Yeah, I apologize. I cannot show you, because I have it on the wrong computer.

MS. RADEL: It will just take a second here. Trying to adjust screens.

MR. BARTELME: Can everyone see the figure now?

MEMBER MARCH-LEUBA: Yes. Yes, we can see now.

MS. RADEL: Okay. So, this figure, this graph, is showing the temperature profile through the TSV dump tank after we've dumped the solution.

So, node one is located on the inner shell of the dump tank, and node 100 is on the outer surface, the outer shell of --

MEMBER MARCH-LEUBA: Can I interrupt you before you go? Because I thought the figure captured in the SFAR, I hope is incorrect. Because on your document that you provided in the box, which is (audio

interference) is CALC-2018-0037, rev. 1.

That (audio interference) line two, which has the same data, but the label is target information temperatures, as function of location of selected times. On the FSAR, you say it's the dump tank temperature. Which of the two is it?

MS. RADEL: This is the target solution temperature, the temperature through the target solution. So, this one through 100 is a spatial --

MEMBER MARCH-LEUBA: If I miss just then, I don't know if you can still modify the final revision of the FSAR.

Make sure 092 on the CALC-2018-0037 agrees with the caption here, because this caption is confusing.

This caption tells me that's the dump tank temperature, when it really is a TSV temperature.

MS. RADEL: It's the target solution temperature within the TSV dump tank. So, it is not --

(Simultaneous speaking.)

MS. RADEL: -- the temperature in the TSV. So, I can walk you through -- let me walk you through the figure here.

So, the analysis that we did provide for

review starts with the target solution in the TSV at the maximum temperature, which is an average target solution temperature of 80 degrees C.

It then takes the three minutes of time delay, as well as -- and I'll have to look at the table to make sure I get this right -- it takes a total of 210 seconds worth of time following shutdown, because we do open the driver breakers as soon as we lose flow.

So, the driver is turned off as soon as we lose flow. And then it takes all of the energy available from decay heat, from delayed neutrons, and any fission that's still occurring in the system, for the duration of 210 seconds following the shutdown.

That includes the 180 seconds, or the three-minute delay, as well as the one-second response on the flow measurement, and the 500 milliseconds for the safety system, and the two seconds for the dump valves, and some additional margin.

And it assumes that all of that energy is deposited in the target solution, without any cooling occurring. It assumes flow has completely stopped and that energy is all converted into heat in the target solution.

And that takes the target solution from

80 degrees C to approximately 87 degrees C. It then is transferred into the dump tank, and we do account for the time it takes to dump as well.

And this graph starts once it's in the dump tank. So, this is the graph of temperature profiles through -- of the target solution in the dump tank once it has entered the dump tank.

So, the 420 seconds is the start of when all the solution is in the dump tank, and it's gotten up to 87 degrees from the original 80 degrees at this point.

And then, we're looking at how the light water pool cools the solution and prevents the peak temperature from reaching the 90 degrees.

MEMBER MARCH-LEUBA: Okay. So then, I still don't understand why we waiting 420 seconds -- this is Jose -- 420 seconds to dump the solution, instead of 180.

MS. RADEL: So, to account for all the different delays and timing in a conservative way. And so, we have 180 seconds for the delay, we have one second for the flow measurement, 500 milliseconds for the logic solver, two seconds before we open the dump valves, and then we have the time it takes to dump the solution, we conservatively assume that one of the

dump valves fails to open as well on top of that.

And we take that amount of time and assume that no cooling of the solution occurs in that 420 seconds.

MEMBER MARCH-LEUBA: So, mostly the difference is the time for the solution to flow down to drip through the valve into the lower tank.

MS. RADEL: Correct. Yes, the drain --

(Simultaneous speaking)

MEMBER MARCH-LEUBA: And even it's a 420-second delay before you start cooling it in the dump tank, your temperature rise by seven degrees C, and remain below (audio interference).

MS. RADEL: Correct.

MEMBER MARCH-LEUBA: Okay.

MEMBER PETTI: And, Tracy, just to confirm, there's no convection in the solution. It's just conduction?

MS. RADEL: I would have to go look and see the analysis.

MEMBER PETTI: These look an awful lot like Bessel functions to me, or some modified Bessel function. And that would imply it's conduction only. Convection would smooth everything out, I would think. Maybe I'm wrong.

MS. RADEL: You're probably correct. I just would have to go to the analysis to confirm.

MEMBER PETTI: Okay, thanks.

MEMBER MARCH-LEUBA: But, bottom line, we're talking about the 180-second delay, where it is concerned about how much margin we have.

So, even assuming this 420 seconds to dump the tank, you only reach 87 degrees C, which is below boiling. And apparently we have roughly a margin of two or more?

So, we have taken 800, 1,000 seconds before we have reached -- no, more than that. Like, a factor of C?

MS. RADEL: Yes. And as I noted as well, we start the analysis with all of the target solution at 80 degrees C, which is significantly above our maximum expected operating temperature.

(Simultaneous speaking.)

MEMBER MARCH-LEUBA: These calculations are run at tech spec limits, because you're allowed to operate a daily. You should prove that you're okay at daily.

I don't think that's a conservatism. This is realism, but I'm not a conservatism in safety analysis. But even with that extreme temperature in

tech spec limits, you only reach a maximum temperature of 87 in 420 seconds.

So, you could have waited a thousand seconds and it still would not have boiled, in my opinion. I'll stop there. I don't have any problems with this. I think I understand now what we're looking at here.

MEMBER DIMITRIJEVIC: Okay, maybe then we can continue with addressing Member Brown's comments.

MR. THOMAS: Sure. And the first comment, it was specified that the offsite AC power sources come from two different, and thus, independent, aligned utility substations.

I do want to point out we do note in subsection 8A2.1.2 of the SR, we identify the two substations in which these sign-offs, like power feeds, originate. It does mention the Alliant Energy trip road substation and the venture substation, the Alliant Energy venture substation.

MEMBER BROWN: Where is that?

MR. THOMAS: Subsection 8A2.1.2 of the SR.

MEMBER BROWN: Okay. I guess I was asleep when I read that. I'm just teasing you. I really wasn't asleep.

MR. THOMAS: Okay.

MEMBER BROWN: You said 8A2.1.2?

MR. THOMAS: Yes.

MEMBER REMPE: And I assume that that's not a more recent version that has been in the FSAR for a long time?

MEMBER BROWN: No, that's the one we had for review.

MEMBER REMPE: Well, there have been updates to some sections of the FSAR, and I just wanted to make sure that maybe Charlie had an older version, or not. Has there been any change?

(Simultaneous speaking.)

MR. BARTELME: Not a recent revision from an earlier revision that went in earlier this year in January. I don't know if that was original, the Rev. 0, when we submitted it in 2019. But it has been in there for a while.

MEMBER BROWN: I've got Rev. 3, and that's where it shows -- are those -- second question that I didn't ask, the Alliant power source electric plant iteration, is that a single generator operation of the two? Are these two substations out of phase? Or do we know that? It doesn't matter, I'm just curious.

MR. BARTELME: Yeah, we have not had conversations with Alliant as to the exact location of

all the different power generators.

(Simultaneous speaking.)

MEMBER BROWN: Okay. They make up the same generator or not, is all you're saying.

MR. BARTELME: Correct.

MEMBER BROWN: Okay. All right, thank you. Well, let me make a note so I know I got an answer here.

CHAIR BALLINGER: Okay, can we push forward a little bit?

MR. THOMAS: Okay. Second recommendation is to revise a couple of figures in chapter eight, figures 8A2.1.

8A2.1-1 and 8A2.2-1, to show the power supply of 125 volt DC UPSS Charlie, not hard-connected, but optioneered. As we discussed back in May, those figures are the simplified depictions of the normal electrical power system and the uninterruptible electrical power system -- the NPSS and the UPSS -- are provided in those two referenced figures, to indicate the auctioneered power provided to Division Charlie from Divisions Alpha and Bravo.

Well, the simplified depiction in those figures doesn't clearly indicate the auctioneering. The auctioneering of that power is described elsewhere

in the SR, subsection 7.4.3.4 of the SR --

(Simultaneous speaking.)

MEMBER BROWN: Okay, the INC section?

MR. THOMAS: Yes, yes. -- discusses the powering of TRPS divisions. It states, TRPS Division Alpha is powered from Division Alpha of the UPSS. TRPS Division Bravo is powered from Division Bravo. The UPS test and TRPS Division Charlie received auctioneered power from Division Alpha and Division Bravo, of the UPSS, and we've got similar statements in a couple of other chapter seven subsections about that auctioneered power to the Charlie Division.

MEMBER BROWN: Okay, what section did you say?

MR. THOMAS: 7.4.3.4.

(Simultaneous speaking.)

MEMBER BROWN: All right, that's good. That's fine. It's there, I just wanted it talked about and you all did.

MEMBER REMPE: This is Joy. And tell me again about the two substations you mentioned? Because I've got a 2.1.2. And again, I'm not sure what version I have, because they don't label it, unfortunately.

But it says that the feeder originates

from the Alliant Energy trip road substation, singular.

MEMBER BROWN: And then, it goes on and talks about the Alliant Energy venture substation.

MEMBER REMPE: I don't see -- I mean, there's only two paragraphs in 8A2.1.2, in my version.

MEMBER BROWN: What revision do you have? Go down to the bottom of the page. Bottom of the page. Rev. 3.

MEMBER REMPE: Oh, I have an older version. Yours does have --

MEMBER BROWN: Yeah, they're good. They're fine. They've answered my question.

MR. BARTELME: Yeah, the current revision of Section 8A2.1 is revision three. And you see that in the bottom right-hand corner of each page of each section.

MEMBER REMPE: I see that now. Thank you.

MR. BARTELME: Okay. All right, and then, Member Brown, a couple of other, 7.5.2.2.4, and subsection 7.5.3.3, another couple of mentions of that auctioneered power in chapter seven.

MEMBER BROWN: 7.5.2.2.4?

MR. BARTELME: Yep.

MEMBER BROWN: And which is the other one?

MR. BARTELME: 7.5.3.3.

MEMBER BROWN: Okay. And just for me, when I keep going into chapter seven, I just want to have those notes to look at them.

MR. BARTELME: And then, there's a similar discussion of the powering of the Division Charlie of the Neutron Flux Detection System, NFDS, in 7.7.1.3.3.

MEMBER BROWN: 7.7. --

MR. BARTELME: 1.3.3.

MEMBER BROWN: And that's for the NFDS power?

MR. BARTELME: Yes.

CHAIR BALLINGER: Now, this is Ron. Today, I think we got -- or I've noticed that we got a revision to the FSAR, chapter seven. When Charlie looks at this, does he need to have that revision?

MEMBER BROWN: What revision are you talking about? All I've got is Rev. 3.

MR. BALAZIK: This is Mike Balazik, NRC Staff. Yes, we just received a revision on chapter seven from SHINE, and we'll provide that to ACRS.

MEMBER BROWN: Is that a complete revision, or just add-ons and changes that you have to find or search your way through a forest of trees?

CHAIR BALLINGER: It's a redlined

version --

(Simultaneous speaking.)

CHAIR BALLINGER: -- but it's all related to the pics.

MEMBER BROWN: Is it a complete chapter?

MR. BARTELME: It is not a complete chapter. Now, what we submitted over the last couple of weeks have been mark-ups reflecting design changes and discussions from regulatory audits, and they're mark-ups of the complete chapter that was last provided in January.

MEMBER BROWN: Okay. Do you have to think revision three, and then try to integrate this into that to gain an understanding? Or is it a whole chapter, or just the redlined markups in it?

MR. BARTELME: It's not a full chapter with redlines. It's what you mentioned, sort of the January submittal, plus then the mark-ups that have been submitted since.

MEMBER BROWN: Okay.

CHAIR BALLINGER: You just need to be playing with a full deck.

MEMBER BROWN: I've never played with a full deck in my life, Ron, so -- okay.

CHAIR BALLINGER: Okay, let's keep going.

Let's keep going.

MR. BARTELME: Okay, so the third recommendation, revised -- same figures, 8A2.1.1 and 8A2.2.1, to show that ACUPSS Charlie is shown to be connected by interlock, either/or AC circuit breakers not hard-connected as shown.

It's, again, like at the DC level above each of those figures, powered ACUPSS Charlie's auctioneered from the Alpha and Bravo buses. Again, those figures are the simplified diagrams, and the mechanisms for auctioneered net power to Division Charlie buses are not represented in the figure, despite those descriptions we identified in the last recommendation. The descriptions of the auctioneered power is being provided elsewhere in the SR.

MEMBER BROWN: You're talking about the AC comment?

MR. BARTELME: Yes.

MEMBER BROWN: The third thing?

MR. BARTELME: Yeah. Yeah.

MEMBER BROWN: Well, that's AC. You don't auctioneer AC. You either supply it from one source or another.

MR. THOMAS: I'm sorry, this is Roger Thomas, Electrical Engineer for SHINE. I don't

believe auctioneering is necessarily a defined definition anywhere that I could find.

So, we use it sort of generically for both AC transfer switches and DC sort of dialed voting system.

MEMBER BROWN: Well, I've spent 50 years doing this, and it was always automatic bus transfers is how they were referred to if you supply two different sources from AC. Not auctioneering.

Auctioneering has always been, in my mind in my lifetime, has always been DC. I understand your point, but I guess I would disagree with you in terms of the definition.

I just wanted to make sure it's clear somewhere. It doesn't say anything, just two straight lines. So, I'm paralleling two differing sources, potentially, depending on what's going on in the plan.

DR. BLEY: So, to that discussion, when you say it's an auctioneered AC source, does that mean that there's an automatic bus transfer that's what's happening?

MR. BARTELME: Correct. Correct.

MEMBER BROWN: Why didn't you say so. That's the point of the comment.

MR. BARTELME: Understand. And we can --

some of these recommendations, we'll look at revisions we can make to the SR to clarify these items.

MEMBER BROWN: I know what it is. It's just making sure it's documented. That's all. It's an AVT-type operation. That'll satisfy me.

CHAIR BALLINGER: Okay, let's go.

MR. BARTELME: I sent recommendation-revised table 8A2.2-1, the UPS load-less, to identify which UPSS each load is attached.

Clarification we want to provide here is that tables 8A2.2-1, EPS load-less, and the battery sizing table that follows, table 8A2.2-2 of the SR, identify which loads are powered by the divisions Alpha and Bravo of the UPSS.

UPSS Division Charlie is provided solely to power the INC loads where a third division is provided. That's where the third division is provided within TRPS, FSAS or NFDS.

A subset of the load descriptions are already provided in those chapter eight tables. We didn't see a need to provide sort of an explicit listing of loads powered by Division C in those chapter eight tables.

MEMBER BROWN: So, those aren't important? I mean, I saw the Table A, the UPS A and the UPS B.

I did not see UPS C anywhere. And you're saying it's not. Is that correct? It's not defined what those are.

MR. THOMAS: The loads for UPS C are incorporated in both the loads of A and the loads of B because of the auctioneering aspect. We had to support those loads all --

(Simultaneous speaking.)

MEMBER BROWN: Okay, I got it.

MS. RADEL: And this is Tracy. Just to clarify, there's not a UPSS C. So, it's just taking from A and B, and recounted for the loads on both A and B.

MEMBER BROWN: Well, UPSS C is a load thing. I mean, it's a bus. And you're just saying that the load, regardless of what they are, they're incorporated -- I'll look at the load table. Does that mean A and B have an increased load demand based on potentially supplying that particular load?

MR. THOMAS: Correct. We had to make sure there was enough margin. And, for instance, UPS A they have all of the UPS A loads, plus all of the UPS C loads.

MEMBER BROWN: Okay. It would be nice to have a note at the bottom of your table that says

UPS C loads are incorporated in UPS A and B. That was just not clear, that's all. I said it would be nice.

MR. BARTELME: I understand. The next recommendation, a request to revise Section 8A2.2, state that the natural gas for the standby generator system, supplied from an offsite utility service, natural gas supplier, acknowledge that the descriptions in Section 8A2.2 do not explicitly state the source of the fuel for the natural gas-driven generator.

The hazards associated with the onsite natural gas pipeline were considered in chapter two, so probably the hazard analysis of this feeder line from the offsite utility. But because the standby generator system provides a defense-in-depth and an acid protection function not relied to protect public health and safety, so I just didn't see this as a necessary design detail to be included in the FSAR.

MEMBER BROWN: Well, you've got to get gas from somewhere. I mean, it's just a big hole. I think you have to discern that from some other chapter.

Otherwise, you immediately start thinking, well, where do I get my gas? And where are the tanks has got to be supplied in it and how do I consider it?

That just seems to be a big hole.

(Simultaneous speaking.)

DR. BLEY: Is it a field decision for whoever's doing the construction, to just pick it?

MR. BARTELME: No. The design considers the feeding of the natural gas from the utility, and that it's communicated in the construction drawings and work packages and such, and the utility installation.

It's included in the design. It just wasn't determined to be a necessary level of detail to be provided in the FSAR.

MEMBER BROWN: Well, in the FSAR, we'd normally consider, if you've got onsite, then you've got one set of considerations. You've got offsite, you've got something else, relative to the overall safety analysis.

It seems a natural place to put it since the SGS is the backup power source and it gets power from a utility service, not an onsite.

I can't tell you what to do, but that seems to be a -- ought to be made clear that it's an offsite source, not an onsite source.

MR. BARTELME: Okay, understand.

MEMBER KIRCHNER: This is Walt Kirchner.

To Charlie's point, the problem with using natural gas from offsite is you don't have control. That you're depending on that utility, that supplier.

You don't have storage, vis-a-vis diesel generators or using jet fuel to fire a gas turbine. So, it is an important issue in terms of reliability and dependability, in terms of relying on that source of backup power.

MR. BARTELME: Understand.

CHAIR BALLINGER: This is Ron Ballinger. To that point, where I live the gas company literally has a triage system in the winter, where certain customers can be cut off before others.

You have a similar system where you guys are going to be? It gets pretty cold in the winter up there.

MR. THOMAS: This is Roger Thomas from SHINEs. My understanding from the discussions with Alliant, you would have to opt for a certain type of service that allows them to cut you off. So, it would be an intermittent service kind of thing.

CHAIR BALLINGER: Yeah. But they would have to let you know.

MR. THOMAS: Correct. And again, it's not a safety-related system. We made that decision based

a lot on talking with them about the reliability of their service and expectations of being cut off for things like that.

MEMBER BROWN: How often are you going to test if this thing automatically starts when you need to, and so you know the gas is there?

MR. THOMAS: The standard for testing it is typically once a month. But we also use that gas service for our boilers. And so, we will be monitoring that far more often than once a month.

MEMBER BROWN: Obviously, you know it's running. The boiler's running for heat and stuff like that, for site services?

MR. THOMAS: Correct.

MEMBER BROWN: Okay.

CHAIR BALLINGER: Okay. Whoops, sorry. Can we push on?

MEMBER REMPE: Can I ask Mike to talk a little more about -- you've discussed this with them and they are going to get service that allows it to be cut off? Is that what you said?

MR. THOMAS: No. We would have to opt for that type of contract.

MEMBER REMPE: And you're not going to do that. You're going to have a contract that is always

on, is what you're telling me. Right?

MR. THOMAS: Correct, barring some kind of disaster where they have a service interruption. Somebody back (audio interference), the whole gas material.

MEMBER REMPE: Okay, and then your discussion with Mike or with the staff, was it documented somewhere, like in an RAI? Or it was just informal meetings it was discussed?

MR. BARTELME: Which discussion with the staff?

MEMBER REMPE: I think Mike came on and said he discussed it with SHINE. Right? I saw his little circle flash.

MR. BORROMEO: So, this is Josh Borromeo. I'm not sure we had this discussion. I mean, this is a non-safety-related backup system. And this might be a level of detail that we wouldn't typically require in an FSAR. So, I mean, we'll certainly take it under advisement. But --

MEMBER REMPE: I thought Michael Balazik --

MR. BORROMEO: Oh, Michael --

MR. BALAZIK: No, Dr. Rempe, I didn't say anything. It might have been somebody else that was

discussing it earlier.

MEMBER REMPE: Oh. Okay, you're --

(Simultaneous speaking.)

MR. BALAZIK: I think that was a member from SHINE that was discussing that.

MEMBER REMPE: Okay, sorry. You're circle flashed and I thought it was you talking. Sorry.

MR. BARTELME: So, the last recommendation in the list here, incorporate a definition of safe shutdown configuration under loop conditions. Response to the question.

SHINE stated that the plan is walkaway safe when a redundant TC battery backup systems, there are three-minute and five-minute stripping of loads.

We touched on this previously. We do provide a definition of safe shutdown, a condition in the SHINE technical specifications for the irradiation units. It's a defined term in the front matter of the tech specs.

And one thing we do want to clarify in this response as well is, it kind of related to the walkaway safe. Under loop conditions -- and Catherine touched on this earlier -- with respect to the operations personnel, would remain in the control room and monitor condition of the facility, including

confirmation that the appropriate load shads had occurred, the UPSS system.

So, the walkaway safe condition, there would be personnel in the control room monitoring the status of the facility and the --

MEMBER BROWN: My only concern is the tech specs were at odds to your place to put the definition of safe-shutdown configuration, that a definition is supplied in the chapter under definitions section, is a far better place to put it, so people know what they're looking at when they go through and read this or are considering the design aspects of the thing.

Can't make you do it. That's just an obscure place to put it. I would have never thought to look at the tech specs to find out what the safe shutdown configuration is.

MEMBER DIMITRIJEVIC: Also, I mean, I don't know. I mean, after six hours, they will not have any instrumentation to monitor anything. Right? Based on your load stripping things, right? Because even this monitoring three-team sources and things like that, this instrumentation is not going to be available after six hours. Right?

(Simultaneous speaking.)

MS. KOLB: This is Catherine. Yes, that's

correct. If the non-safety standby generator is not functioning and its power was not restored, we are relying solely on the safety-related, uninterruptible power supply system. And yes, the batteries would run out after six hours, at minimum.

MEMBER BROWN: Is that stated in the chapter? I missed that if I did. The six-hour time?

MS. KOLB: The minimum required times for the loads on the UPSS are in chapter eight.

MEMBER BROWN: Yeah, okay. Yeah, I see the six hours. Okay, it's in table 8A2.2-1? That's where I saw the six hours.

MR. BARTELME: Yeah, one of those two Section 8A2.2 tables, either table one or two.

MEMBER BROWN: Okay.

MR. BARTELME: 8A2.2.

MEMBER BROWN: So, to take Vesna's point, I was thinking about the six hours, and this is the answer. So, after six hours, if you don't get power from either the SGS and no restoration of Alliant, what's the circumstances of the plant?

I took the comment from the previous subcommittee meeting, this was literally a walkaway. You could go home and have a beer -- don't take that literally -- and the plant would be safe, regardless

of six hours, twelve hours, or 24 hours. Is that correct or not correct?

MS. KOLB: So, the design, there's nothing that needs to be required, either during that six hours or after, with the exception of ensuring that the NGPS, the Nitrogen Purge System tanks, are refilled after 72 hours. They're only sized to last for 72 hours.

So, if power is not restored in order to provide the hydrogen mitigation function, then those tanks would need to be recharged with compressed nitrogen.

MEMBER BROWN: Okay, but that's consistent with the three-day requirements for getting some offsite assistance to do that anyway. Right?

MS. KOLB: Correct.

MEMBER BROWN: Okay. I didn't think that was an inconsistent consideration. All right, thank you.

CHAIR BALLINGER: Are we through with chapter eight?

MR. BARTELME: This is the last recommendation.

CHAIR BALLINGER: Ah.

MEMBER BROWN: If they're going to do

something. Thank you.

CHAIR BALLINGER: Next chapter.

MEMBER DIMITRIJEVIC: I want to ask one question, which was on my list and we said the first time. The recovery in the three minutes is not really safety concern means that thing is going to be dumped anyway in the three minutes.

So, one of my questions was, can operator bypass opening dump valves? Let's say that he's working on recovering power back and he has to do duction and he's right there, but he wants to prevent dumping. Does he have the power to bypass those valves?

MS. KOLB: No.

MEMBER DIMITRIJEVIC: No? So, he cannot do anything about if the flow or the cooling system is not restored, that's it. The things are going to dump.

MS. KOLB: After 180 seconds, if the flow or the temperature is not restored, there will be a IU cell (phonetic) safety actuation, and the target solution will dump.

The procedures that we are drafting will reflect that configuration and those requirements as well.

MEMBER DIMITRIJEVIC: Okay. Because I thinking that he can make an operator error in trying to preserve the solution in -- all right, so you said it's not possible for him physically to bypass dumping.

MS. KOLB: So, if we're going to talk about what's physically possible, I mean, within 180 seconds, it's very unlikely. But, I mean, it is physically possible to bypass things, but that would be well outside of all the training and the procedures and their license.

So, physically possible in the INC system, sure. But that would need to be a concerted effort, against all of their training and their requirements and their license.

MEMBER DIMITRIJEVIC: But we know what happens occasionally. He can shut high-pressure (audio interference) decide. So, I mean --

(Simultaneous speaking.)

DR. BLEY: When you say physically possible, can you do it with switches?

(Simultaneous speaking.)

MS. KOLB: So, in the TRPS system there are the other service and the bypass switches. So, you would need to know which cards that all these

inputs that are affected feed into, put them to bypass, and then take them out of service.

And then, go into the fix system, the non-safety system, and reset the timing and the actuation. So, I don't know whether it's physically possible to do that in 180 seconds. But it is theoretically possible, I suppose.

DR. BLEY: Sounds pretty darn hard to do. And most of what you say about the training resonates, except if you study lots of events out in the real world, you find somebody gets clever one day and it just makes sense to them, and they do things you really don't expect them to do from their training.

MS. KOLB: Understand.

MEMBER DIMITRIJEVIC: But we have a deficient training then. I mean, could be both. So, the procedures, planning, and everything connected with this, will be sort of important from.

CHAIR BALLINGER: Okay, so I'm assuming that we're about to make a transition to another chapter. We have been at this for an hour-and-a-half. I'd like to take a ten-minute break before we pick up. Is that agreeable to people?

So, we will take a ten-minute break. By my atomic clock over here, we come back at 2:47.

Thank you.

(Whereupon, the above-entitled matter went off the record at 2:38 p.m. and resumed at 2:50 p.m.)

CHAIR BALLINGER: Okay, it's 2:50, we're back in session. I assume that we're going to be dealing with chapter four based on what I can sort of see on the screen. I can't read any of it, but I'm assuming that the SHINE folks will tell us what all these numbers are, because none of us can read it. Except for Dave Petti, who is standing right next to it.

MEMBER REMPE: So, this is Joy, and since you're showing this in the open session, instead of out on the Box, could you send it to Chris, and he can forward it to all of the members, and we can all have our own copy?

MR. BARTELME: This copy was placed on -- this redacted version was placed on Box this morning.

MEMBER REMPE: But we are not allowed to take things from the Box, and have it on our NRC computer, or our personal computer since this is open, and so could you have this, and take it off of the Box, and send it to Chris so we can have our own version?

MEMBER MARCH-LEUBA: Yeah, this is posted by procedure, if it's shown in an open meeting, it's part of the transcript, so it is already public.

MEMBER REMPE: It is, but I can't take notes on it right now Jose, I mean it would be nice if you could send a copy to Chris, and let him send it to us.

MR. BARTELME: Yes, we can do that.

MR. BALAZIK: This is Mike Balazik for NRC staff, Jeff I'll take care of this, I'll send it over right now to Chris via email.

MR. BARTELME: Thanks Mike.

MEMBER REMPE: Great, thank you.

CHAIR BALLINGER: Okay, let's go.

MR. BARTELME: So, we made a request to move forward to the discussion of the timing tables. We put this timing table together, and made it available to the members last week. Tracy can kind of lead the discussion on what we've put together, and made available here.

MS. RADEL: So, going through these, it's laid out for each of the variables within TRPS, and SFAS, what time was accounted for with respect to the instrument response time, the logic solver, details on any delay if applicable. And then the final element

is referring to say a valve, or a damper, or an isolation, how long it takes for those physical components to reach their fully closed position.

Or open, depending on what the item may be. And then there's another column there with the time used in either a safety basis calculation, or the accident analysis. So, depending on which item we're looking at, it may be a thermal hydraulics calculation, it may be an accidental dose calculation. So, we did get a couple of comments, and I was going to touch on those, and then open up to any other questions, or things you wanted me to walk through in particular.

So, one of the questions was related to the ten second timing on the PCLS temperature seeming to be overly conservative as far as response time for an RTD. So, that was chosen based on the initial design was to use thermal wells for the temperature instrumentation, and we did an actual timing study on the amount of time it would take to recognize temperature changes based on heat transfer through the thermal wells.

We, in the end, decided to place the RTD directly in the process stream, so we no longer have thermal wells there. So, that timing is conservative,

we would expect a much faster response time than that with the instrumentation direct in the process stream at this point, but the ten seconds was originally chosen with thermal wells in mind.

MEMBER MARCH-LEUBA: So, this is Jose, we do not have thermal wells.

MS. RADEL: In the PCLS, as well as the TSV off gas system, that is correct, there are not thermal wells there. So, there are thermal wells within -- for the non-safety related RTDs within the target solution vessel.

MEMBER MARCH-LEUBA: Yeah, this is a low pressure system, it's not like in operating plants. In operating plants those thermal wells can have as much as 60 second time delays, but this is for a very high pressure, thick wall. So, yeah, and you are direct contact so ten seconds is more than conservative. Okay, thank you.

MS. RADEL: And the second question was related to the radiation monitor timing of 15 seconds seeming conservative, and we do agree that we would expect it to recognize the condition prior to the 15 seconds, but I wanted to go with the conservative number, as well as allow for additional time for averaging, and giving better statistics on the number.

That kind of additional longer duration averaging time has not been used in our uncertainty calculation at this point, but is something that was considered that we would be able to measure more accurately if we have a little more averaging time.

MEMBER MARCH-LEUBA: This is again Jose. You are speculating a total count measurement, not an energy spectrum definition to identify a single energy peak, correct? The total --

MS. RADEL: Correct, it's count based, yeah.

MEMBER MARCH-LEUBA: 15 seconds, you'll get extremely good statistics no matter where you put it. Okay, so it's just conservatism, my concern was that you were -- maybe we were trying to do an energy spectrum to identify a particular isotope on an energy peak, and then 15 seconds may not be sufficient. But if you're doing total counts, 15 seconds is more than enough. Okay, thank you.

MS. RADEL: Yeah. Okay, and another question we received was looking for clarification on the timing around the dump valves, and the flux detection, and the total timing of three seconds there. So, the safety analysis use the three seconds, that three seconds is to account for the 450

milliseconds of instrument response time, the 500 milliseconds for the TRPS system, and then the two seconds for the valve to fully open.

So, in the discussion that was noted here, the SR notes within one second, the dump valves will begin to open. That one second is that instrument response time, and logic solver time, so that was not referring to something inherent to the valve, but in the time prior to the valve being told to open, or to start opening. So, that one second it's referring to is the instrument response time, plus the logic solver time.

And then to go from starting to open to fully open is a two second duration for the valves, is what was allotted to those valves, they actually open quicker than that, but the total time line is three seconds. So, any further questions on that one?

MEMBER MARCH-LEUBA: Not on that one, but on a separate one. Are you done with your presentation? It's one I don't think I have told you in advance.

MS. RADEL: Yes, so I think I covered all of the times that were sent, specific questions in advance, so I open it up to you.

MEMBER MARCH-LEUBA: Let me ask you one

that catches you a little on surprise. The power range flux average time of 45 seconds, that's the third row, are we ever achieving the neutron flux that takes over 45 seconds, because you expect the neutron driver to be very noisy, like you could have tritium pressure oscillations that will give you a ten millisecond spike.

And before you answer, let me say where I'm coming from. Normally with licensed reactors, to the peak hour, even if it's only for ten milliseconds, and here we appear to be licensing the facility for the 45 second average power, and I don't see in my mind any problem with that, because as I always say, the fuel is already molten, it's already a liquid, there's nothing you can do to this fuel that will damage it.

But is this what we're doing, the license is for a maximum power of 100 and change kilowatts on average of 45 seconds? Go ahead.

MS. RADEL: Yes, so the averaging time is to account for variation in the neutron driver. So, as it's operating it is expected to in the systems that we are running now, and testing now do perform very stably as they're operating within a few percent of where they're at. But they do have -- it can have

these drop out moments that are very quick, less than a second drop outs where it drops out, and comes back in.

And that doesn't inherently affect the system, either the solution, or the operation, but could cause a slight spike in power due to some of the void escaping during those very short drop outs. And so that time averaging allows us to not trick off on small driver dropouts.

MEMBER MARCH-LEUBA: Yes, so this, I'll need to remember, because it's not currently in my memo, to add a sentence to this, that it is -- there is an echo -- there is a deviation from standard practice. Whereas in operating reactors we license for peak power, SHINE is licensed to the 45 second average power. And because of the special nature of the solution, where you cannot damage the fuel, that's perfectly okay.

You worry about heat removal, not that -- there is no SAFDL with specified acceptable fuel limits because the fuel is already molten. So, probably the staff should recognize light radiation in this, it is different than what we're used to do.

MEMBER KIRCHNER: Jose, this is Walt, I looked at that, and I thought that was a typo. I

thought it meant to be 4.5 seconds. Let me ask a question, at the power range, I mean this is a trip signal on high power, or is this the low power range limit. Is this startup instrumentation, or is this full power operation instrumentation?

MS. RADEL: This is full power operation, so in addition to the time average trip, we also have a high live range neutron flux trip that is not averaged, so --

MEMBER KIRCHNER: Okay, you should add that to the note then, because the 45 seconds as Jose was indicating, normally wouldn't be acceptable. I mean you could do some serious damage in 45 seconds, notwithstanding that the fuel is already in a molten, or liquid configuration. I mean an overpower transit could lead to boiling, and pressurization of the system.

So, you've got, in addition to this, you have a high flux trip --

MS. RADEL: Correct, and they work in conjunction with each other. So, the wide range neutron flux trip, and the time averaging on the power range neutron flux trip both are used within the safety basis thermal hydraulics calculation to demonstrate that no matter what the scenario in that

45 seconds -- that those two trips in combination protect the system.

MEMBER KIRCHNER: Great, okay, thank you very much.

MEMBER MARCH-LEUBA: But isn't the wide range of flux, let's call it a little inaccurate? I mean that's why we use power range, because it's more accurate. I assume that if you have a 20 percent peak, wide range would see it.

MS. RADEL: So, the uncertainty on it is fairly small, it's listed in table 7.4-1, I can pull it up to confirm whether it's the one, or two percent. But it's a small difference there.

MEMBER MARCH-LEUBA: Over the full range, a couple of percent?

MS. RADEL: Yes, and that's listed in table 7.4-1.

MEMBER MARCH-LEUBA: Okay, just the 45 seconds looks a little long, but given the special circumstances, and characteristics of this reactor, in my mind it's acceptable. Okay, thank you.

MEMBER REMPE: So, this is Joy, and I appreciate you going through, and generating this table, and explaining what some of the items are today, like final element that I was puzzled about.

The other thing I was puzzled about, and that's why I really appreciate you doing this table, is that I know when we discussed this before, often you'd say it's in whatever section of the FSAR.

But even in this table you are citing subsections of the FSAR, and providing numbers that I don't see in the FSAR, is that true?

MS. RADEL: So, just to reiterate from our previous discussion, for some of these, the timing is not explicitly stated within the FSAR. The FSAR contains a summary of the analysis that was performed, and not all numbers in that analysis are explicitly stated, but that cross references to where the description of the analysis in which the timing was used is listed there. And so you may not see every single number explicitly stated within the FSAR.

MEMBER REMPE: And that's what motivated this question, and the request for this table, because it was not clear if enough time was there for subsequent systems to take actions in a timely fashion. So, I guess I'm curious how the staff, so maybe this is a question for the staff rather than SHINE had competence that things were appropriately accounted for without this table, because you guys weren't so concerned about it as us, right?

MR. BORROMEO: So, this is Josh Borromeo, we took a deep dive at this in chapter seven, and that's where we were trying to figure out where each of these things were cross referenced. We did a vertical, and horizontal slice of these timings through audits, and so we verified these times, and their various calculations in audit space, that's primarily where we got our confidence to move forward --

MEMBER REMPE: And is that audit documented in a report so that we could also kind of see it?

MR. BORROMEO: So, that audit report, we're generating that now, it's not completed yet, but we can certainly -- there are calculations where we took a look at some of these items, where we sampled these that we could potentially point you to, to take a look at what we --

MEMBER REMPE: That would be helpful. Again, I guess I'm thinking about with all the wave of new applications coming, and the importance of instrumentation, and timing, and especially if operators are going to be less important, and systems are going to rely more on passive features, or whatever, it would be good to make sure everybody's

thinking about the instrumentation, and there's enough time there to get things done.

So, yeah I appreciate seeing the audit, and that's why I'm really glad we went through this exercise.

MR. BORROMEO: Understood.

CHAIR BALLINGER: Okay, should we move on? Whatever that means. Are we through with this?

MEMBER REMPE: Yeah, I guess I just wanted to also emphasize something we talked about during the break, that this plus that stainless steel 347 question, which you said has been addressed are the only two items I had left on chapter four, because we took care of them in other chapter discussions.

CHAIR BALLINGER: So, I think as far as we're concerned, we're okay right? So, can we switch to the next chapter? Are we going in order with the agenda, or are we switching back, and forth?

MR. BALAZIK: Professor, this is Mike Balazik again, NRC staff, I think we should just continue in order, touch upon chapter nine, auxiliary systems.

CHAIR BALLINGER: Okay, good, thanks.

MEMBER MARCH-LEUBA: This is Jose, can we stay on chapter 13, I have one clarification question,

high level.

CHAIR BALLINGER: We're going to get to chapter 13.

MEMBER MARCH-LEUBA: Yeah, we are in chapter 13 now.

MEMBER REMPE: No, we're in chapter four Jose.

CHAIR BALLINGER: Yeah, we're in chapter four.

MEMBER REMPE: It's confusing because they interact. By the way too, I still would like to see the audit report from the staff Ron, as an action item, just to follow through, and cross my T's, and dot my I's.

CHAIR BALLINGER: Chris isn't here.

MEMBER REMPE: That's why I'm mentioning it on the record here, but I think that the staff will know, and take care of it.

CHAIR BALLINGER: All right, Chris is there now. Okay, so onto chapter nine?

MR. BALAZIK: Yeah, this is Mike Balazik, NRC staff. Chapter nine, there was a concern related to the nitrogen purge systems, and the numbers that SHINE has used in tech specs of 2100 pounds, and a certain number of tubes before all the TSVs need to be

dumped, and there was a comment about deeming margin on that tech spec to avoid unnecessary facility shutdowns. Jeff, you guys are going to address this one?

MR. BARTELME: Yeah, Catherine can speak to that one.

MR. BALAZIK: Yeah.

MS. KOLB: Yes, this is Catherine Kolb. So, yeah the comment was about the margin that we had. So, the calculations that we have done require the numbers that we have put into the technical specifications, the 2100 pounds, and 11 out of the 12 provided tubes. I mean there is an opportunity for us to recover some operational immersion there with the relief valve on these tubes set, and they are rated for 2800 pounds.

So, we can keep them filled higher than the minimum number in the tech specs for some additional margin. But that is the calculation that we have right now in order to assure that we can successfully deliver the minimum required flow for the 72 hours that we've put in the tech specs. So, while we acknowledge your concern on our operational philosophy there, we do have some margin, not infinite margin, that is where we are.

MEMBER SUNSERI: It's not a big concern, it was just a comment based on practical experience, it's just meant for your use, and information only, it's really not a major concern for us. And that's Matt Sunseri speaking.

CHAIR BALLINGER: That does it for chapter nine.

MR. BALAZIK: Okay, this is Mike Balazik, NRC staff, I'll continue on with chapter 11. There was a concern, or observation related to addressing strategies to avoid complacency, maintaining a questioning attitude, and ensuring that reactor protection staff are comfortable raising safety issues, not only with the SHINE organization, but directly with the NRC staff.

I will say that in chapter 12, conduct of operations, within NUREG 15.37, safety culture isn't addressed. That's usually something that the staff addresses in inspection space. We have two inspections that we do for safety culture to evaluate a licensee's independent safety culture assessment. I'll also say that there are numerous ways that SHINE staff can report a safety concern directly to the NRC, like when there's an inspector out there.

Also there's the NRC form three, which

provides guidance to all employees where they can send safety concerns to. So, I mean again, we don't plan on addressing anything related to safety culture in chapter 11, just because there is no guidance in the NUREGs that talks about that. And I know that SHINE doesn't have any information related to safety culture in the FSAR. I don't know if there's anything additional that SHINE wants to add to the conversation.

MR. BARTELME: SHINE, we do have a safety culture program, an effort to foster a strong safety conscious work environment. We do frequently remind, communicate with all SHINE employees, we do have the multiple avenues to raise concerns, to raise safety issues either via our corrective action program, immediately to an individual supervisor.

And we do communicate that we also have -- we do post form three, and to make it clear to SHINE staff that they can go communicate directly, or raise an issue directly with the NRC, and that directions are on those posted form threes.

MEMBER BIER: Thank you, this is Vicki Bier, I think that was in response to comments, or questions that I had raised earlier, so I appreciate it. I am not a regulatory person, so didn't know what

to expect under conduct of operations. The answer I think makes sense to me, that it's not something that belongs there. The one thing that I did want to mention while we're on the topic, I once heard a talk from I think a National Lab director, or whatever.

Who said that basically achieving safety required being schizophrenic, because you spend every morning telling every external stakeholder that things are okay, right? The press, the legislature, your local officials, et cetera, don't worry, we know exactly what we're doing, this is a well understood technology, everything is under control, we have a lot of expertise.

And every afternoon telling your staff you can never be too careful, don't get too complacent, something could go wrong at any moment. So, that underscores the importance of the issue, but I can completely accept that that's probably not something that belongs in the FSAR chapter.

MEMBER HALNON: This is Greg Halnon, Mike you mentioned the inspections, is this the end of the reactor oversight process, or is this under some other inspection regime? Because the only safety culture stuff's in the oversight process.

MR. BALAZIK: No, this is Mike Balazik,

NRC staff. It is not going to be under the ROP, but we have used those inspection procedures, it's 95003, and there's another inspection procedure, 4100. And while we have used these, I'll say recently, to look at a licensee's third party assessment for safety culture. For example, the NIST event, we've incorporated it there.

And there was another licensee where we did an assessment of that safety culture -- I'm sorry, an evaluation of their third party safety culture assessment. But no, it's not going to be under the ROP. The research, and test reactors aren't under the ROP, but we can apply those inspection procedures to them.

MEMBER HALNON: Thank you.

CHAIR BALLINGER: This is Ron, seemingly off topic, you want to know what happens when you don't have a good safety culture, there's an article in Aviation Week, which I will send out if anybody wants it, where it describes what happened with the Boeing 737 issues, and the crashes, and things like that. It's a very informative article. I think I sent a copy to Dennis, who might want to make a comment. But if anybody wants it, I'm happy to provide with this article. It's what happens when you

blow it basically.

MEMBER KIRCHNER: Just send it out to everyone Ron, thank you.

DR. SCHULTZ: Mike, This is Steve Schultz. You mentioned the inspections that could be done, what kind of frequency would that be on?

MR. BALAZIK: Well, for the specific for safety culture, if we were to request SHINE perform a third party assessment, that's when we would do that particular inspection on safety culture. Is this more of a general ask of, I'll say the generic safety inspections when we're performing those, or is it related strictly to safety culture?

DR. SCHULTZ: It was related to safety culture particularly.

MR. BALAZIK: Yeah, so we would do those if we were to request SHINE do a third party safety culture assessment, that's when we would do those. So, it's not that we do it every year, every two years, it's when we request them to do the third party assessment.

DR. SCHULTZ: But when you do your inspections, I mean you look at the corrective action program, an inspector would identify the need for safety culture improvements in a standard inspection

that might be done?

MR. BALAZIK: Correct, and to identify any deficiencies with those corrective actions related to the assessment.

DR. SCHULTZ: And that might lead you to look into safety culture if you had something more than a minor finding in an inspection.

MR. BALAZIK: Definitely, yes sir.

DR. SCHULTZ: Thank you.

MEMBER SUNSERI: This is Matt, and just looking at the most recent construction inspection, there are elements of the quality assurance program, and corrective action program that were specifically looked at, and those are all elements of safety culture if you want to call it that. So, it is happening, and there is evidence that you're looking at, so that's good.

DR. SCHULTZ: Matt, this is Steve again, that's what I was referring. I saw that in the inspection that had been done, and I saw the corrective actions that were developed as a response to the inspection, and I had a question for SHINE there. There were eight corrective actions that were generated as a result of the May inspection, could you give me a quick brief as to what the status of the

progress is on correcting those elements that were identified?

MR. BARTELME: This is Jeff Bartelme from SHINE, I'd have to pull those, and look for an updated status on the IMRs initiated during the inspection, I don't have it at the ready.

DR. SCHULTZ: Could you give us an update? It could be in July, but I think they're probably all done, but I'd like to know, I would appreciate that.

MR. BARTELME: Sure, I can certainly do that.

MEMBER REMPE: This is Joy, and I need to step back for a second about this table for timing. You showed it in the public session, it has information redacted, but yet the top header of the sheet says proprietary information, so it has incorrect markings, what is it? Proprietary, or open?

MR. BARTELME: This is Jeff Bartelme, the version that was shared, there were a couple numbers in there that are proprietary. We did redact those so that the header was changed from withhold to withheld, just to make clear that --

MEMBER REMPE: Okay, so it is public?

MR. BALAZIK: Yes, this is Mike Balazik, NRC staff, this is how SHINE has done the entire

public FSAR, where they want to identify those pages where proprietary information was withheld from the public.

MEMBER REMPE: Thank you, I missed the withheld, I thought it said withhold, or something, thank you.

MR. BALAZIK: Yeah.

CHAIR BALLINGER: Are we through with this part? Hopefully. That leaves 12.7, 12.13, and 13, so can we do 12.7?

MR. BALAZIK: Yeah, this is Mike Balazik NRC -- go ahead Catherine.

MS. KOLB: Sorry, we were just going to address 12.7 here briefly if that's what you were intending.

MR. BALAZIK: Yes.

MS. KOLB: Got it. So, this is Catherine Kolb, we appreciate the comments that we received last time, and we are intending to implement items three, and four about the clarifying tasks, and the EPZ boundary in the next revision of the EQUIN (phonetic) and then we have issued an item in our corrective action program to track the disposition of the other comments that were identified for future revisions, and, or implementing procedures?

MEMBER HALNON: Yeah, this is Greg, thanks for taking care of that.

MR. BALAZIK: Yeah, this is Mike Balazik, NRC staff, continue on, there was an item in chapter 12.13, which is MC&A related to certain limits that were used. Jeff, SHINE's going to address these?

MS. RADEL: Yes, this is Tracy, I'll speak to these. So, we do share the concern of the .125 percent being a challenge to achieve given the type of facility that we have. We are performing an SCID tabletop exercise right now to determine if that .125 is achievable, or if an exemption would need to be sought for that.

CHAIR BALLINGER: Yeah, that was not a safety issue, we just thought that it was not achievable.

MEMBER PETTI: I think the issue for the staff is could they come in, and say they want to use the 4.5 kilogram that they discussed.

MEMBER MARCH-LEUBA: Can you turn the mic up?

MEMBER PETTI: The question for the staff is whether they can use the 4.5 kilograms that they discussed in the NUREG.

CHAIR BALLINGER: They're basically trying

to shoehorn something into the NUREG which has nothing to do with --

MEMBER PETTI: That doesn't necessarily fit with the staff looking at that.

MR. BALAZIK: This is Mike Balazik, NRC staff, Glenn, do you have any thoughts on that?

MR. TUTTLE: Yeah, this is Glenn Tuttle with Office of Nuclear Material Safety and Safeguards, the MC&A reviewer. The only comment I had, they're doing the right thing by doing their tabletop. The 4.5 kgs that is referenced in NUREG 10.65, the 10.65 is for the category three facilities. And for category three facilities, 4.5 kilograms is part of the rule. So, they have the greater of 4.5 kgs, or .125 percent of active inventory for the category three facilities.

For the category two facility, we don't give them that 4500 kgs limit. So, it's strictly .125 percent. So, what SHINE is doing is right. They've got to figure out can they get near it, or not, and they'll be doing that in the tabletop.

MEMBER PETTI: So, they're a category two facility?

MR. TUTTLE: That's right.

MEMBER PETTI: Okay, thank you.

CHAIR BALLINGER: Okay, so chapter 13?

MEMBER BROWN: 12.7 still.

CHAIR BALLINGER: Okay, 12.7, we're on -- okay.

MEMBER BROWN: That's what you just finished wasn't it?

CHAIR BALLINGER: No, one three, 13.

MEMBER BROWN: Did we finish 12.7?

CHAIR BALLINGER: Right.

MEMBER BROWN: Boy, that one whizzed right by me, yeah, I want to go back. This is just a head's up. Number two under 12.7 says there is no mention who oversees cyber security, or how cyber is considered in the planned physical security is clear, that the security department has the accountability, however cyber security sometimes covered by engineering, which is a corporate function, not exactly.

Adding this description would be helpful. I'm just giving you a head's up that when we do chapter seven, none of the plant controls, the TRPS, the NFDS, the other plant control, and monitoring systems, you cannot incorporate cyber security software into those systems, and make sure they operate properly, because they cannot be continuously

updated.

They will be slowed down, might even not respond. So, there will be a considerable questions asked relative to how we ensure control of access is exterminated relative to its ability to get into any of those systems. That's based on the control of access thought process, and the digital data communications out of those systems to other systems, or outside the plant.

Just giving you a head's up that we will be discussing that in spades relative to the chapter seven meeting in July. July the 20th, or something like that.

MR. BALAZIK: This is Mike Balazik, NRC staff, I know that we'll be discussing chapter seven July 19th, and 20th, but the cyber security piece of that is going to be in September. Understand that you can ask questions that we can resolve at a later date on that September when we discuss cyber security.

MEMBER BROWN: Okay, well cyber security does not apply to the TRPS system, it's a control of access issue, so I'm making sure you understand the differentiation. You can't just build cabinets that have fiber optic cables hanging out of them with no communication device, and waiting for somebody to do

something later. We've been through this drill before, and just wanted to make sure that subject, they are separate subjects.

Control of access to those systems is different than cyber security to all the other numerous systems that you have within the plant.

MR. BALAZIK: Understand, thank you.

MEMBER BROWN: Okay, thank you Ron, I'm done.

CHAIR BALLINGER: Okay, we're up to chapter 13, and by my agenda, we also have a closed session that's related to chapter 13. So, I guess my question to everybody is, and the staff, and SHINE, is do we need the closed session on chapter 13?

MR. BALAZIK: This is Mike Balazik, NRC staff, and SHINE can chime in also, the only need for the closed session was to discuss those proprietary numbers, or any other proprietary information. So, I mean are ACRS members looking for further discussion on those two proprietary numbers?

CHAIR BALLINGER: My guess is Jose probably has something to say here.

MEMBER MARCH-LEUBA: My question was not proprietary. What proprietary numbers are you talking about?

MR. BALAZIK: They're identified in the table. They were blanked out.

MEMBER MARCH-LEUBA: The chapter four quote unquote table?

MR. BALAZIK: Yes, the timing table, correct.

MEMBER MARCH-LEUBA: Yeah, I'm not interested on those blacked out numbers.

MR. BALAZIK: Those are driver dropout numbers.

MEMBER MARCH-LEUBA: Yes, I know.

CHAIR BALLINGER: What I'm trying to get at is should we just proceed now, and complete everything, and then that would finish us up, or should we plan on a closed session?

MEMBER MARCH-LEUBA: Let's leave that decision to the end of the discussion, and if something pops up, we close the session.

CHAIR BALLINGER: All right, so let's go with 13.

MEMBER MARCH-LEUBA: Okay, so since you brought up the driver dropout, that is exclusively (audio interference) enhancement function, has nothing to do with reactor protection, is that correct?

MS. RADEL: Sorry, can you restate the question?

MEMBER MARCH-LEUBA: The driver dropout delay, which is a proprietary number, but that is an exclusively an operational concern to improve reliability, and has nothing to do with reactor protection functions?

MS. RADEL: So, this is Tracy. Allowing for a driver dropout is for operability reasons. The duration that the driver is allowed to dropout is a safety aspect, so the reason for that is that after the driver drops out within a short period of time, the void is expected to leave the solution. After that, because the PCLS is still running, the target solution will cool, which also is going to add reactivity to the system.

And if the driver were to come back on after a certain period of time, the system would risk hitting that limit. So, we do have that duration, which is proprietary, that protects the system from hitting the power density limit.

MEMBER MARCH-LEUBA: The delay does not prevent this accident, if you were to restart so many seconds later, you would be even colder, and with less

of it, and that's one of the accidents that is analyzed. And it's shown that a trip would occur if that happens.

MS. RADEL: Yes, the trip will occur, we still would not want to hit the

limit, even if we trip the unit. We don't want to reach that power density, even if it's for a short duration. So, the flex trip isn't fast enough to stop that really fast spike that comes in as the driver comes back in, and so we only allow it to drop out for that certain period of time.

Because after that, you would have built in enough reactivity through the cooling of the target solution that that peak could potentially reach the power density limit.

MEMBER MARCH-LEUBA: So, let me see, what you're trying to prevent is for the driver to come back on its own at full power, what you want is to have what they call a civilized restart, a ramp up?

MS. RADEL: Correct.

MEMBER MARCH-LEUBA: Yeah, so we're trying to prevent this spurious recovery, and you will only have an operator driven restart, which will be as a ramp up?

MS. RADEL: Yeah, correct.

MEMBER KIRCHNER: So, Tracy, this s Walt Kirchner, isn't this interlocked? I mean once it drops out to prevent his restart, is there some kind of interlock that once it drops out, the operator has to manually override something to restart it?

MS. RADEL: After the driver dropout duration passes, the breakers open, the breakers are opened by the safety system after that delay, which is proprietary.

MEMBER KIRCHNER: Well, yeah, but just sticking on the safety part, not the numbers, which I find odd. You get to -- what I'm having trouble with is the concept of operations from the safety standpoint. You would actually let the system go back online by itself?

MS. RADEL: Yes. So, the system is able to auto recover, and that's necessary because there are very short dropouts that occur with this type of accelerator system. So, it will see a momentary drop of beam, and come back on in much less than a second, that kind of drops out, and comes back on. So, we have those dropouts. There are times where it'll dropout for a few seconds as well, depending on what it's recovering from.

The duration that we determined here is

more driven from the safety side of it, of how long can we allow it to drop out before we would not want it to come back on for that power density reason.

MEMBER KIRCHNER: Yeah, but that seems like a much longer delay period than the intermittent operation of the accelerator.

MS. RADEL: It is.

MEMBER KIRCHNER: It seems to me that you can average out the intermittence of the accelerator performance, but when you come to an actual it's out, and now the system as you described is cooling down, the void's collapsed, you're adding reactivity, it would seem to me that system shouldn't be able to turn itself back on automatically.

MS. RADEL: Yes. So, the duration is longer than what we would expect in those auto recovery scenarios, so it's unlikely we'll see many auto recoveries in the time frame between a few seconds, and the limit that we put in place. But the limit was driven by what is a safe duration to allow it to come back on, so we approached it from, for safety reasons, what amount of time can this occur.

So, I agree that it's unlikely that we will have many auto recoveries that are past a few seconds, just because if it's out for that long, it's

likely something that will keep it down for a more extended period of time.

MEMBER KIRCHNER: Yeah, so that was my point. For that contingency, I would think that the system would be interlocked, and you would have the operator have to intervene to allow a restart. That's an observation, it's not a recommendation.

MS. RADEL: Yes, noted.

CHAIR BALLINGER: We're on 13.

MEMBER MARCH-LEUBA: Okay, back to my question I wanted to give earlier, and this is completely different. The members have discussed on the production of a memo for chapter 13, that the use of the maximum hypothetical accident, MHA, was a good idea, and it was a good idea to supplement it with the SSA, the SHINE safety analysis. We talked among ourselves that maybe other submittals would maybe want to follow the example that SHINE has used.

Meaning if it worked for SHINE, it would work for us. But we have some difference of opinion on what you did. So, can you refresh for me how the MHA was identified. Was it based on a thoughtful process, a surge, or what could possibly be the worst thing that you can do, or was it based on running the SSA first, and picking the worst?

MS. RADEL: So, this is Tracy. It was chosen from -- it was chosen to be the worst design basis accident that could occur. In order to find the worst design basis accident that could occur, we did not limit ourselves in any way. Going through the HAZAP FMEA process, identifying all the potential process upsets, and conditions that could occur within the systems.

Identifying all of those accident sequences, then we did categorize those according to the categories that are within NUREG 15.37 for any ones that did not fit into those categories, we put those into the facility specific events to make sure they were also captured. We did the radiological dose consequence analysis for bonding scenarios in all accident categories.

And then from those results, we determined which scenario was bounding. As noted previously, there is a tritium event that is slightly higher than the fission product based event that was chosen as the MHA, and there was quite a bit of discussion on which of those to choose. We went with the fission product based event there, but did capture the tritium event as well in chapter 13.

MEMBER MARCH-LEUBA: So, then the MHA was

chosen based on the results of the hazard analysis, and the SSA?

MS. RADEL: Correct.

MEMBER MARCH-LEUBA: Okay, thank you. I'm glad you put this on the record, because as we said, we thought that this is likely, at least possible that other submittals would follow your example, so it's good that we all know what you did exactly. Some of us remember it differently, so thank you. And I don't have any more questions for chapter 13. Anybody has more questions, Walt, or Joy, or Vesna?

MEMBER KIRCHNER: I don't Jose, thank you for asking.

DR. BLEY: This is Dennis, I don't have a chapter 13 exactly question, but it was related to 13. I apologize to Chris, I should have given you a call. It might be my problem with using the Box system, but I've recently gone back in to review the SHINE safety analysis again, the tech report 2020-16 Rev 5, and I find it's still listed in the ACRS file list.

But when I go to the review for February 16th, I don't find it there anymore. Is it there, or am I just having trouble using Box, or can you put it back there?

MR. BARTELME: This is Jeff Bartelme from

SHINE, Mike Balazik, and I had identified some files on Box that were no longer there, and Mike can speak to the specifics, but I believe there's some time limit, that they're removed after some time. But we can put any of these X analysis related docs back on the reading room.

DR. BLEY: That main SSA document I'd really like you to put back up, because I'm going to go back, and use it some more.

MR. BALAZIK: Yeah, this is Mike Balazik, NRC staff, there is a time limit on how long documents stay on Box. I believe it is 90 days, and what I have requested through Box is an extension to 180 days, we'll see if that gets approved, or not. But yes, we'll get the SSA loaded back up to the Box account.

DR. BLEY: Thank you very much.

CHAIR BALLINGER: Questions from the members, others? So, now I need to ask the question again, do we need a closed session? If we need a closed session, then we'll do public comments now, and then switch to a closed session.

MEMBER MARCH-LEUBA: This is Jose, I don't need a closed session.

CHAIR BALLINGER: Okay, it sounds like we don't need a closed session. So, what we can do now

is ask if there are members of the public that would like to make a comment. If there are members that would like to make a comment, please state your name, and make your comment. Reminding if you're on the phone, I think you use star six again to unmute yourself. I always wonder about dead silence.

But hearing none, then let's ask one more time for members if there are questions that need to be looked at, or consultants, excuse me, I apologize.

MEMBER BROWN: You could always ask somebody just speak to make sure the phone line's there, that's what we did in the old days, I don't know what we do now.

CHAIR BALLINGER: Tap your hands on the desk, or something. Okay, I haven't heard anything, and it sounds to me like we're done for the meeting today. Hopefully we'll get the transcript quickly, because that's the only record, we have no slides of this, except for the table I guess, but it's available to the members anyway, it's being sent out.

MEMBER REMPE: It's already been sent out, I just didn't notice it had switched from withhold to withheld, the fine print, one letter difference.

CHAIR BALLINGER: Next week just to give you guys a little bit of a head's up, next week I'm

going to start working hard on assembling the framework of the letter. I've got memos from people, and there's a lot of text that I can use now. So, if you've got comments related to this, at least up to these chapters, now is the time to chime in, and send them to me. Except we will not accept any comments from Charlie.

MEMBER BROWN: They're still on the line, right?

CHAIR BALLINGER: I think so.

MEMBER BROWN: I was making rough notes as we went through chapter eight, and I forgot to write something down in a couple places, and I wanted to make sure if I could, as opposed to reading through the transcript, I would like to ask the question to make sure I knew where I was referencing something.

CHAIR BALLINGER: Should we all leave, and leave you here for them?

MEMBER BROWN: No, this is short, this is not going to be long. Is SHINE there?

MR. BARTELME: Yes, we're still here.

MEMBER BROWN: Okay, if you remember back on chapter eight, we were talking about the AC UPSS C, and the ABT configuration, and you commented that it was talked about somewhere as an auctioneered

function. Forget about the difference between auctioneering, and ABT, that's a separate issue. Just I thought I remembered you telling me it was actually discussed somewhere other than in chapter eight.

MR. BARTELME: Right, this is Jeff Bartelme, we just had those more general discussions of auctioneering power for those Charlie divisions within the I&C systems, but we don't have any more specific discussion about the mechanism for the feeding of the AC UPSS Charlie.

MEMBER BROWN: Okay, so we kind of left that hanging in a way, I referred to them as ABT operations, and you all had called out some place about auctioneering. I don't have a problem with the DC part that you referred to earlier, because it was covered in a number of sections in chapter seven, and that's what triggered when I was looking, trying to make my notes again, that there wasn't anything on the C ones. So, you answered me, there is nothing.

MR. BARTELME: Yeah.

MEMBER BROWN: Okay, that's fine, I will try to correct what I wrote down then. The other one was the safe shutdown configuration, you referred to it as being specified in the tech specs, is that correct?

MR. BARTELME: Correct, in the definitions section of tech specs, a safe shutdown definition.

MEMBER BROWN: Okay, and I commented that I thought this was an obscure location, and thought you ought to have it in more easily recognized sections as you go through the various chapters, but anyway, that's just repeating myself. It was in the tech spec, I got that, that's all I had. No, I had one more. Natural gas, we had some discussion on natural gas, and I was left hanging on -- I guess my comment was we ought to note that it's supplied from an offsite utility.

And then we kind of bounced around in a couple of discussions, and other people said something, and I lost track of how that one was left. Is somebody going to consider noting that in chapter eight as the supply for this SGS? Or someplace else?

MR. BARTELME: This is Jeff from SHINE, that consideration, we can look at clarifying that in the SGS discussion in chapter eight.

MEMBER BROWN: Okay, so you would look at clarifying?

MR. BARTELME: Yeah.

MEMBER BROWN: Okay, I'm writing it real quick here, before I forget it.

DR. SCHULTZ: Ron, one quick comment, and this is not associated with the discussion today, although Matt did bring it up. Really appreciate the report on the inspection that was performed in May. I thought that the staff did an excellent job, very comprehensive report on a detailed inspection of the facility, and of course that's a compliment also to the applicant.

Because usually when an inspection is done so thoroughly with only minor comments associated with findings, that reflects the cooperation, as well as the detail that has been put in by the applicant in moving things forward in an appropriate way. So, really appreciated what the staff had done there, and documented as a result of that inspection.

MEMBER REMPE: There's one other point, I know we've talked about this chapter seven instrumentation timing audit report, and do you have an idea of when we'll be able to see it, and would it be in time to do anything, including for this discussion in the letter?

MR. BORROMEO: So, what we can do at a minimum, is point at the calculations that we took a look at, where we took a sample of the timings. We're still completing the chapter seven review now, and

we'll have to get back to you on the exact timing.

MEMBER REMPE: The letter's not due until October, I just was curious, because if so, we might want to close out, because we brought this up in chapter four, as well as chapter 13 trying to understand the timing, but we can wait until later.

MR. BORROMEO: Okay, we'll work with Chris, and get you a date.

MEMBER REMPE: Thank you.

CHAIR BALLINGER: I hear some shuffling out there. Okay, I think that we are finished for the day. So, hearing -- at the risk of hearing something else --

MR. BALAZIK: Professor, this is Mike Balazik, NRC staff, there was one item that we did talk about, and that's kind of pulsing the members on the August 17th trip out to SHINE, is that going to be done during this forum, or a different forum?

CHAIR BALLINGER: That's probably a full committee discussion, right? No?

MR. BALAZIK: On what they are interested in seeing when they go out to the SHINE facility.

CHAIR BALLINGER: Yeah, Chris has reminded me, we have periodic, frequent actually, informal discussions about things like this, and so we'll have

input from the members, and do it in the informal that we'll have. That means we'd like to have input from the members before we have the informal.

MEMBER REMPE: So, you are opening up the floor now for what members would like to see right now, or you want to wait until later? I'm confused now.

CHAIR BALLINGER: I'm not, I mean we don't have the whole committee here, so we don't know who's going, and who's not from the committee.

MR. BROWN: Yeah, this is Chris Brown. So, we had planned an informal meeting with Mike Balazik, and Shawn, and actually Shawn wanted to come in in July, and we were going to actually try to talk to them in person, so we thought about doing an informal meeting. If you feel that it's appropriate, you can get out some things that you want to see when you go visit SHINE now, I don't see a problem with that, but we can still have an informal meeting with them later.

MEMBER REMPE: To help us with the discussion, give us an idea of how the construction is going along, and what all is installed, and not installed, I'm not sure I've heard that in recent times. Maybe Ron, and Chris had been up to date, but

what's the site look like right now?

CHAIR BALLINGER: The staff was there, right? No?

MR. BORROMEO: Yeah, so we were just there under construction, but Jeff, maybe you could provide a quick update of where you're at in the construction space.

MS. RADEL: Yeah, so this is Tracy, I can provide a bit of a status. So, much of the build out of the administration annex is pretty far along, built out with all the framing, and the switch gear has been set, and that auxiliary system installation is well underway. Framing out of the control room area, battery rooms, that portion, the entire building has got the siding, and roofing, and exterior completed.

Installation of process piping is well underway, both shock welding, and in the field down in the trench. We are placing tanks within the tank vaults in the sub grade area. The liners are installed in all of the IU cells, and TSV off gas system cells. The support structures for the neutron drivers are arriving, and the installation of those support structures will begin shortly.

The significant amount of equipment has arrived at the warehouse, so we have six of our eight

subcritical assembly system skins at the warehouse waiting for installation. The super style shipments are starting to arrive, so there's work going on in the facility to install the base plates for the super cell. So, lots of different activities going on right now.

CHAIR BALLINGER: So, by the time we would go out there, there's going to be a substantial amount of work that's been done.

MEMBER REMPE: Are there some areas where we would not be welcome to visit, so we should exclude from our wish list, because of ongoing construction activities, or just difficulties for access that we should be concerned about, that you won't let us see?

MS. RADEL: There are not any areas that we would limit other than to protect your safety, and we would make sure that we follow the site rules as far as confined space. We wouldn't allow entry into a confined space, or entry into the room where the switch gear is, because it has been hooked to power, and energized. So, there's certain things safety wise that we would make sure to observe the site rules on.

But for the most part you would be able to see into all areas, just certain areas you wouldn't be able to enter, because of the requirements for safety.

CHAIR BALLINGER: Okay, so at least that's a good starting point. Okay, at the risk of starting another conversation, I think we are done for the day, thank you very much for a really great discussion. We are pretty unfettered in our questioning, so it's good that everybody was here. So, thank you once again, and we are adjourned.

(Whereupon, the above-entitled matter went off the record at 3:58 p.m.)