Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Filtering Strategies Rulemaking and Order EA-13-109 Public Meeting

Docket Number: (n/a)

Location: Rockville, Maryland

Date: June 19, 2014

Work Order No.: NRC-867 Pages 1-95

NEAL R. GROSS AND CO., INC.
Court Reporters and Transcribers
1323 Rhode Island Avenue, N.W.
Washington, D.C. 20005
(202) 234-4433

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

+ + + + +

FILTERING STRATEGIES RULEMAKING AND ORDER EA-13-109

PUBLIC MEETING

+ + + + +

THURSDAY,

JUNE 19, 2014

+ + + + +

The meeting was convened at the Nuclear Regulatory Commission, Three White Flint North, Room 9A28, 11601 Lansdown Street, Rockville, Maryland, at 9:00 a.m., Aaron Szabo, project manager, presiding.

PRESENT:

SHER BAHADUR, NRC, Deputy Director, NRR

AARON SZABO, NRC, NRR

PHIL AMWAY, Exelon Corporation

RAJ AULUCK, NRC, NRR

JANA BERGMAN, Scientech

JEROME BETTLE, NRC, NRR

JACK DAVIS, NRC, NRR

ROBERT DENNIG, NRC, NRR

HOSSEIN ESMAILI, NRC, Office of Research

PATRICK FALLON, DTE Energy

TERRI FARTHING, GEH

ED FULLER, NRC, Office of Research

JEFF GABER, ERIN Engineering

RAO KARIPINENI, NRC, NRR

MARIA KORSNICK, Exelon Corporation

GREG KRUEGER, Exelon Corporation

STEVEN KRAFT, Nuclear Energy Institute

JAMES SHEA, NRC

BRETT TITUS, NRC, NRR

DOUG TRUE, ERIN Engineering

KARL STURZEBECHER, NRC, NR

MARTY STUTZKE, NRC, Office of Research

RICK WACHOWIAK, EPRI

WEIDONG WANG, ACRS Staff

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

P R O C E E D I N G S

(8:59 a.m.)

MR. BAHADUR: Well, good morning. My name is Sher Bahadur, the deputy director in the Division of Policy and Rulemaking here at NRR.

And I see a lot of familiar faces here, which is good news. That means the interactions with the public and the stakeholders that we are having on this rulemaking is about as significant to you as it has been to us.

I understand yesterday we had a very fruitful session. So, thank you for continuing to the second day and we hopefully will have an equally productive session for today.

I believe today we are going to talk about Phase 2 of the order. And I am looking forward to hearing from you the processes and also the concepts, the deliverables that you plan on doing in this regard.

MS. KORSNICK: Yes

MR. BAHADUR: And it's a full agenda. So, I plan to speak for about two hours, but I think I'll cut it short to accommodate.

Just on a personal note, this is the last time that I will be coming in front of you as I'm retiring

June 30. So, I'm probably here about 29 years, eight months, three days and some hours.

(Laughter.)

MR. BAHADUR: Every moment of this has been very pleasant for me and I have some good memories to take with me.

So, with that, I will ask Aaron to start the session. Jack is going to be here in the meeting and I am going to have to leave soon. So, thank you again for showing up.

MR. SZABO: Okay. I am Aaron Szabo. I'm the project manager for the rulemaking. I'm just going to go quickly over just some administrative things and then hand it over to Maria for the industry presentations.

This is the second day of the rulemaking and order public meeting. We had as Sher mentioned, a very good day yesterday going through various issues within the rulemaking.

Today we're going to be focusing on the concept, deliverables and the milestones for the Order Phase 2.

Just on the agenda, as I said, I'm just going to go through this and then I'm going to hand it

over to NEI however long you guys take. We can take a break at around 10:15 if you want. Depending on how this is going, we might just power through it all. And then we'll open it up to some general comments and discussion.

As mentioned yesterday, this is a Category 2 public meeting. Any comments during presentations should be limited to material presented and then we're going to have a general public comment opportunity at the end.

Also, this meeting is being transcribed. Especially for those people who are on the phone, please know that it is being transcribed.

There has been some issues with the teleconference number. I'm not going to go through that because if they're on the phone right now, they clearly have the right number and also the webinar information.

Just another note just based on some issues we had yesterday, please make sure to mute your phone. If you are on the teleconference, it's, I believe, star six or pound six that will also mute you if you do not have a mute button. So, please make sure that you are muted so that mostly other people on the phone line can

hear what's going on.

Right now I just want to go through around the room to introduce yourself.

(Introductions.)

MR. SZABO: And then those people on the phone if you can introduce yourself - if you can also send an email to me, Aaron, A-A-R-O-N, dot Szabo, S-Z-A-B-O, at NRC.gov confirming your attendance, it would greatly help me out.

Even if you did attend yesterday, please just send me another email that you came today. But if those on the phone could introduce themselves now?

(Introductions.)

MR. SZABO: All right. With that, I will open it up to any opening comments and then hand it over to Maria for presentation.

MS. KORSNICK: Okay. Great. So, what I'd like to do is we're going to just start a little bit of a recap from some conversations that we had at the last meeting that I was here where we were talking about the importance of water.

And I think at that meeting, we also mentioned that we would then look into some more detail and frame out some deliverables. And so, that's what

you'll see as we go through the conversation today, same concept thought through a little bit more with some proposed deliverables.

So, as you see here, compliance with Phase 2 of the vent order, in our view, should focus on water addition as well as water management prior to the consideration of hardening the containment drywell vent basically to ensure that our resources are focused first on the greatest safety benefit, and also the understanding of the water actually plays into the design requirements for the drywell vent.

So, the next slide. Again, really a recap of conversations that we had at the last one. That the safety benefit of the reliable water addition is very significant.

And so, the role of water addition and water management and severe accident response, we feel, merits the consideration prior to the drywell design.

And, again, that the design requirements of the drywell vent, in fact, are dependent on water management strategies essentially based on, for example, temperature considerations.

The next slide highlights again -

MR. HAGER: Excuse me.

MS. KORSNICK: Yes, sir.

MR. HAGER: Are the slides being displayed on the webinar?

MR. SZABO: Yes, they are.

MS. KORSNICK: Yes.

MR. HAGER: I'm not getting the - I'm just getting the introductory screen.

MR. SZABO: Oh, there you are.

MR. HAGER: There they are. Thank you.

MR. KRAFT: Thanks for asking.

MS. KORSNICK: Thank you.

The next slide talks about the actual value of the reliable water and fact that it preserves the containment boundary.

Obviously, we're very, you know, interested in anything that would affect the liner, reduces the containment temperature. Therefore, reducing our thermal challenges and reduces airborne fission products again based on reducing the airborne aerosols. So, again, a key and essential element of our severe accident management strategy.

The next slide introduces two terms. We'll be using these throughout today. So, just to spend a few minutes.

So, S-A-W-A, severe accident water addition. So, this is saying that you just have the means of providing water to the reactor vessel and/or the drywell post-core damage.

Obviously, that's important because a lot of things we've talked about post-Fukushima and flex, for example, is prior to core damage. So, the idea here is we're ensuring that we have the ability to add this water after core damage.

And then there is severe accident water management. So, this is where it goes into not just adding it, but now you're looking at your flow rates, your pressure, where you're adding the water, is that to the drywell, is it to the reactor vessel and looking at how you're managing it.

Okay. So, just wanted to make sure there's a distinction and understanding of water addition versus water management. And that will play into, you know, when we talk about the milestones.

So, the next slide talks about resequencing what we feel would be for the greatest safety benefit.

So, if you look on the left-hand side of the slide, that's the current sequence as the order was envisioned.

So, you can see the wetwell vent. That's what we consider Phase 1. That's going extremely well. We're not looking for any changes there.

Then the intention had been to go into the drywell vent, meaning first do the technical requirements. And then the water management strategies and water addition and filter strategies rulemaking, if you will, were later in the timeline.

And so, if you look on the right-hand side, you can see the revised sequence where, again, the wetwell vent and anything around that unchanged from Phase 1, but now we're looking at saying, hey, let's get an understanding and create the water addition first while we're still doing some of the analysis which will go into detail around water management.

And that will then feed into the drywell vent functional and technical requirements. And of course some of this always intended to occur in parallel, if you will, with the filtering strategies rulemaking.

So, when you look at addition and then management you say, well, you know, Maria, why one before the next?

Clearly we want, again, going with the

greatest safety benefit soonest, having the ability to add water is always a good thing. And the management of it will start playing into potentially maybe instrumentation that you're going to want to use to monitor something, et cetera.

So, there might be some additional things that you'll do in terms of the management of it, but the hardware in terms of physically what would you do to add water would be captured under the second one.

MR. FULLER: Excuse me, Maria.

MS. KORSNICK: Uh-huh.

MR. FULLER: In the severe accident water addition step, does that also include a determination of where the hookups would be either in the reactor building or outside of the reactor building?

MR. KRAFT: Yes, Ed. The way we see it is that you would have to - we would write guidance that would tell people how to do exactly what you're saying, but it would - we can talk about this more in detail, but the idea is, is that -- is whether or not you actually take an existing, call it, FLEX connection and provide that capability may be one option.

Some plants may have a more creative way available to it like preferentially reenergizing

certain pumps that may be under FLEX recover -- or FLEX and then ultimate plant recovery maybe later down and then move it up earlier. Things like that may come.

We don't want to be so doctrinaire as to say you must take a FLEX connection and harden it, because that may not be the most optimum thing for any given plant.

MS. KORSNICK: But the idea here is that you have motive force and a path --

MR. KRAFT: Right.

MS. KORSNICK: -- right, to get it in, right, post-core damage.

MR. KRAFT: Right.

MR. FULLER: And so, you'll have the power and the water and the open vent will provide you the heat sink. And those are the three essential things you need to have.

MR. KRAFT: I think that sounds about right.

MR. TRUE: The vent is coming from Phase 1?

MR. KRAFT: Yeah.

MS. KORSNICK: Yeah, the vent -- right now we would -

MR. FULLER: The vent is from Phase 1.

MS. KORSNICK: -- credit right from the wetwell vent. And that's why I just wanted to be clear in all of this conversation, you know, Phase 1 is considered to go on as is with the wetwell. None of this is changing anything to do with the wetwell vent.

MR. DAVIS: Maria, before you go on --

MS. KORSNICK: Yes.

MR. DAVIS: -- I'm sorry, I just want to follow up.

So, underneath the water management piece, that's when you'd be making those decisions on what you'd harden, Steve?

MR. KRAFT: No, water addition you would make those decisions.

MR. DAVIS: So, water addition -

MR. KRAFT: We're not using the term "harden," Jack. We're not - what we're trying - I'll be very plain about it.

MR. DAVIS: Okay.

MR. KRAFT: What we're trying to do is avoid a new requirement that says you must have reliable, severe accident-capable water addition.

That implies an engineered injection system that if you have to have it, you have to, I mean,

if the engineer at the plant says, you know what? There's no other way to do it. That's one thing, but there may be other ways to accomplish it.

And to me, I know that water says reliable, but there's all kinds of shades of reliability.

And, you know, you're talking about an event that's way down the probability curve that maybe, you know, the word "reliable" may not have the same meaning than if you're in design basis space. So, I just make that clear. We've got to be careful.

MR. DAVIS: Right. And I think the key point you're making is that we need to align around what do we mean by reliable.

MR. KRAFT: Absolutely.

MR. DAVIS: Right.

MR. KRAFT: Absolutely.

MR. DAVIS: Okay.

MS. KORSNICK: Yes. So, again, water, a motive force and a pathway to get there, right, in a post-accident scenario.

And then the management piece, again, think of that as, you know, you're now having a better view. Do you think you're doing this for, you know, 48 hours? Are you doing it for 72 hours?

What are things that you want to do to be able to control it in that time frame? Do you have the right instrumentation to measure that?

So, the management piece will come into, I'll just say, sort of dialing it in, but we want to make sure that it's clear that the water addition should be done sooner, right, so that we should have the ability God forbid that we would find ourself in a situation. Once you have the tools at your disposal, right, we're able to use them.

MR. DAVIS: Right. And I guess that - see, that's the part that's tripping me up because wouldn't you have to do a lot of that work to figure out what you actually needed on the front end?

MR. KRAFT: No. I mean, if you were simply to draw a line after water management and say we're done, you have existing requirements and SAMGs that say, put water in. Just get water in. Flood out, you know.

MR. DAVIS: Right.

MR. KRAFT: We're trying to say, okay, let's make that -

MS. KORSNICK: Refine it.

MR. KRAFT: Let's refine that.

MR. DAVIS: Okay.

MR. KRAFT: The next step is - and this is why you'll see the schedules. It's much - it's longer. We have to go through the Owner's Group and the EPG/SAG folks and say, okay, wait a minute. Is that four feet above the core debris the right number? Is it lower? Is it higher? What's the latest science on that?

Because you got to - if the answer is you don't touch the SAMGs and you do what - then water management, it's not an issue. When we mean water management, you're talking about a finer level of control post-accident, post-severe accident, which is another -

MS. KORSNICK: So, I could --

MR. DAVIS: Okay.

MS. KORSNICK: I could say it a different way and I could say they could be the same thing.

MR. DAVIS: Uh-huh.

MS. KORSNICK: And that would cause the schedule, in our view, to be very far out. And we would choose that they're not the same thing so that we'd say, let's do water addition now in the confines of the current procedural guidance we have. To us, that adds value and safety benefit.

There is a better way perhaps to do it.

Dial it in would be the best way. Well, but if we decide that, that's going to be procedure changes, et cetera. We'll do all that stuff, but it's just going to take us longer.

But we shouldn't hold the safety benefit for all that to happen, because there's clearly a lot of safety benefits sooner, okay. So, I think that kind of, you know, paints it.

We could have kept them connected, but we actually see more safety benefit by doing it in this way.

MR. SZABO: I have one quick question.

MS. KORSNICK: Yes.

MR. SZABO: And this might just be -- it might be resolved later. It's just about the sequencing.

MS. KORSNICK: Uh-huh.

MR. SZABO: The drywell vent functional and technical requirements and the severe accident water management, is there any reason why those were switched to the revised schedule in relation to how they were in the current schedule?

MR. KRAFT: Yeah.

MR. SZABO: I mean, they're kind of in parallel.

MR. KRAFT: Well, they're not -

MS. KORSNICK: Well, because what we said is their decisions on water affects your temperature, which affects the drywell vent requirement. So, they're very purposefully switched.

MR. KRAFT: You get your temperatures down. You delay the time if you need the drywell vent.

MR. SZABO: Okay.

MR. KRAFT: You change the functional and design requirements of the drywell vent.

MS. KORSNICK: Uh-huh.

MR. SZABO: Okay.

MS. KORSNICK: Yeah, that, in fact, is the whole --

MR. KRAFT: It's the whole reason.

MS. KORSNICK: The whole reason that we're here.

MR. FULLER: In fact, a lot of what goes into your water management step is really going to be based on what the outcomes are in the filtering strategies rulemaking.

MS. KORSNICK: There's connectivity.

MR. KRAFT: There's a lot of connectivity there and we were talking about that before coming over

here that -- you'll notice on the left side we identified what part of the NRC process you're in.

On the right side, we purposely didn't put that in there because we know what we're doing is we're pulling something up out of the filtering strategies rulemaking and complying with it in the order.

The order does not require water addition. It implies water addition because it allows you the management, take advantage of it. Can't manage something you don't have, but it doesn't require it.

We in the scheme of things before coming to this realization, water addition was going to fall out of the rulemaking.

What we're finding, you know, if we do it now -- so, it becomes -

MR. DAVIS: Yeah, I think the way to say it is the order is permissive.

MR. KRAFT: It is permissive.

MS. KORSNICK: Exactly.

MR. KRAFT: And it changes -

MS. KORSNICK: Good way to say it.

MR. KRAFT: -- I think, some of the thinking in the ultimate rulemaking as well.

MS. KORSNICK: Yeah. And, again, I just

wanted to be honest when we - after the order came out and there was a lot of conversations between the industry, between the NRC and we just developed a view as you saw on the left-hand side, you know, wetwell, drywell and, again, we sort of had connected the water stuff really with the filtering strategies piece and knew that it would eventually get work.

And then of course as we worked on it more, we just said why - why would we wait on that? That feels much more important sooner. And so, again, going back to the revised sequence.

I think eventually we would have gotten it all done. I just think doing it in this order is a better service from a safety perspective.

MR. KRAFT: Well, beyond that, having stuck with this original sequence and we would have gotten it all done, but at the end of the day we would have said, you know what? We severely over-designed the drywell vent.

MS. KORSNICK: Yeah.

MR. KRAFT: It's not had been necessary, and you -- then you get into all this issue of -

MS. KORSNICK: That's correct.

MR. KRAFT: -- wasted resources and --

MS. KORSNICK: That's correct.

MR. KRAFT: -- safety benefit and everything else.

MS. KORSNICK: You're exactly right. Not only that, I think we would have had more rework done the other way to your point, Steve. And we're trying as best we can to do it in a way that we're minimizing rework for both parties.

So, the next slide is - again, I offer this for conversation. You see the word "draft" on there. That's very deliberate. This is really just, you know, a draft, if you will, to say here's how we could see it playing out.

And so, you can start with the technical and regulatory process for compliance. And you can see 13-02 Chapter 3 due date end of this year, November. For the safety guidance to be in March of next year. And the integrated plan, December of next year for the overall approach for Phase 2.

And then when we go into the specifics we talked about, all right, first we talked about the severe accident water addition. So, now we're talking hardware. So, you have a means for adding this water post-core damage.

We're saying, all right, that could be again November of this year with safety guidance March of next year, integrated plan end of next year December '15. And then you can see implementation '18/'19 refueling outages.

MR. FULLER: Those are consistent with current water schedule, right?

MR. KRAFT: Correct.

MS. KORSNICK: Right.

Then you get into the water management strategy, and this is where, again, we're talking about controlling the water to prolong the use of the wetwell and the capability to control containment pressure and heat removal following the wetwell vent closure.

There's a lot more analytical work that needs to play out in this phase and more plant-specific analysis in this phase. And that's where you see we feel that we could get a draft by midway through '16 with a date into the first quarter of '17. Following your safety guidance would then be July of '17.

And then depending on what your analysis said, is there hardware or is there not hardware needed, that would fall out of - again, the hardware we're talking about here is more likely instrumentation-type

hardware as opposed to, you know, pumps, valves, that kind of thing.

And we also are taking a look at the duration, how long that we're going to be using this. So, minimum duration until resources are available to not need to use your drywell vent.

Again, we feel that that can be connected to the flowchart for this year. So, November for 2014 with an interim safety guidance into March of next year.

And then from all of that work if we need a drywell, our proposal is if we were to align on the temperatures that you see here, so with severe accident water addition, 350 degrees, and without severe accident water addition, 545 degrees, if we had a buy-in on that, that we could meet the dates that you see here.

And I say that very openly and candidly, because I think there's a lot of conversation about those temperatures.

And so, if that's not something that we could align to, then, again, I think that's something that has to play out, you know, further in this conversation.

MR. FULLER: Excuse me. Where does the 350F come from?

MR. AMWAY: The 350F is the same as the wetwell vent design temperature.

MR. FULLER: Oh, because that's a pre-core damage temperature - no core damage temperature.

MR. KRAFT: No.

MR. AMWAY: It was core damage, but it was essentially based on the saturation temperature associated with PCPL.

MR. FULLER: So, that would be in the wetwell.

MR. KRAFT: Yes.

MR. FULLER: So, if you're going to go into the drywell side, what makes you think you could achieve 350 if you have core damage?

MR. AMWAY: Well, that's what we're looking at in terms of the analysis as we know with water addition that does have an impact on temperature and it brings the overall temperatures in containment down.

MR. FULLER: Well, Hossein Esmaili showed a slide yesterday of some temperatures with various scenarios and I don't recall them being that low.

MR. KARIPINENI: In fact, the industry slides also showed some -

MR. FULLER: Or was that Jeff's slides?

Somebody's slides yesterday.

MR. KARIPINENI: So, there's some question on the temperature.

MS. KORSNICK: Exactly. And my intention wasn't to have the temperature discussion here. I simply was saying if we wanted to align on these dates, it would require something like this like a very quick alignment relative to this.

I realize that there is a lot of conversation that has to play out. And so, you know, given that, it's going to be connected then with this broader water management conversation. And so, those dates would slip.

So, again, just trying to say from a milestone perspective, these are the deliverables that seem most directly connected to getting to the end point. That one is going to depend on if we can appreciate the criteria.

MR. DAVIS: Right. Before you get there, though, it's not so much necessarily the number, right? If we could align on a number in those columns, then you can meet the schedule, right?

MS. KORSNICK: Yeah. The only thing I'd be --

MR. KRAFT: Well, it depends upon the number.

MS. KORSNICK: Let me just blow it out of proportion.

MR. DAVIS: Yeah.

MS. KORSNICK: Let's say, well, Maria, it's a thousand degrees, you know. Well, if it's a thousand degrees, that is -

MR. DAVIS: That's different.

MS. KORSNICK: -- a little bit different in terms of, you know, materials that are available that can, you know, support, you know, a design like that, that kind of thing.

And of course our challenge is once it gets, you know, the significance of that, that's where we'd say, well, that's why we want to have the rest of this play out first to see if whether or not if you don't have to use the drywell vent, then why am I designing something for this, you know, significant post-accident, you know, scenario. So, that's why the conclusion of the earlier stuff becomes relevant to it.

Now, some people's strategy might be I got to have it. I got to use it. Okay. Well, then, you know, that - so, I'm not saying that it's one size fits

all, but I'm saying that you need to understand how important it is to you and your design.

MR. DAVIS: Uh-huh, and does the - where you have the water addition hardware and you're meeting the '18/'19 refueling outage, does that meet the order then without having - because you have your water management strategy which potentially goes beyond -

MR. KRAFT: Well, it's the dates in the order. But the way I read Phase 2, it doesn't completely meet the requirement. You've not complied with Phase 2 yet.

MR. DAVIS: Okay.

MR. KRAFT: But this was just to show that we can get - we believe the industry can get - it's in draft and we're still talking with industry.

MR. DAVIS: Right.

MR. KRAFT: We believe the industry can get to that, you know, at least get to that, get that far, right, but you have not fully complied with Phase 2 of the order.

MS. KORSNICK: No.

MR. DAVIS: Okay.

MR. KRAFT: Going back to these temperatures and not to restart an argument we had

before, but when we say 350 degrees design, we also mean it's capable of far greater because that's the way designs work, right?

So, whether it's still within the regime Jeff showed or not, I just - that's a design point, not a capability point.

MS. KORSNICK: Yes.

MR. DAVIS: Okay. Good point.

MS. KORSNICK: So, again, and I'm not trying to drag up - I know there's a lot of differing opinions and challenges around that. Again, just wanted to be clear that that's something -

MR. KARIPINENI: Question on the --

MS. KORSNICK: Go ahead.

MR. KARIPINENI: On the implementation dates, the water addition hardware if you can get it done by 2018/'19 refueling outages, the strategy, if that doesn't require any new hardware -

MR. KRAFT: It might. We don't know.

MR. KARIPINENI: -- we could meet that date too, right?

MR. KRAFT: No, we show a year out on that one, Rao, because we're not a hundred percent sure. The big issue here if there is no hardware additional

requirement for that and we're thinking if there is hardware, it might be more in the instrumentation, right, you still have to go through the EPG/SAG revision process.

MS. KORSNICK: Yes.

MR. KRAFT: And that's a lengthy process in the industry. You've got committees of people that do that work. They're very deliberate. They're very careful.

You got to be careful how you do this. Whether it's a full revision or a partial revision, we have - they're first beginning to explore that with the Owner's Group.

MR. DAVIS: Right, but this isn't - this wouldn't be the entire B fleet, right? Each plant is probably in a different -

MS. KORSNICK: Well, for -

MR. DAVIS: Definitely between Mark I and Mark II.

MS. KORSNICK: Right. So, for SAMG updates, it would have to get from a BWR Owner's Group perspective. They have to issue the -

MR. DAVIS: They have to, okay.

MS. KORSNICK: -- here's the guidance.

MR. DAVIS: Okay.

MR. KRAFT: Right.

MS. KORSNICK: Then the individual plant has to, to your point, pull out the part that's relevant to them, but you can't move as an individual plant to update your SAMGs --

MR. DAVIS: Okay.

MS. KORSNICK: -- for something like this.

MR. DAVIS: All right. Thanks.

MS. KORSNICK: And so, that's what's built into this timeline.

MR. DAVIS: Okay.

MR. KRAFT: Right. What's not built into this timeline and we owe you some discussion on that and we didn't make explicit, is dealing with the Mark II bypass issue.

We're just kicking off an exercise to look at that between NEI and the Owner's Group, the Mark II part of the BWR fleet.

You've got to deal with that issue for water management and probably water addition. So, we're going to be adding that in.

It's buried in here and we don't explicitly call it out. We're first getting together to talk about

that in July.

MR. DAVIS: All right.

MR. KRAFT: So, I just want to warn you to don't think that's implied in here.

MR. DAVIS: Okay.

MR. FULLER: On that one, are plant modifications to protect the drain line, et cetera, on the table?

MR. KRAFT: They are, Ed. I don't know that we can make commitment to that. There are designs that are out there and GE's looked at it in the past, but there were some things said yesterday and I got some emails last night that could be very creative solutions involving how you handle water, what you do with water, where water resides during normal operation.

I don't know whether this is possible, but there may be some other ways to look at it that we haven't explored yet.

So, what we're going to try to do is just get together with that small portion of the Owner's Group and get everyone's creativity going as to how we might resolve that issue, but what you're saying is correct. It's one possible solution.

MS. KORSNICK: So, we're going to have Phil

actually go into a little bit more detail on some of this. My intention here was to just kind of give you a first blush of how we took the concept water first, what does that actually mean when you turn it into deliverables, and try to be as, you know, clear as we could in terms of, you know, these things by current dates, these things that might push some dates. Again, all in draft. This is really just intended to be, you know, a conversation starter.

And with that, Phil, I think I'll turn -

MR. KRAFT: Well, then go to the last page. Go to that last page.

MR. DAVIS: It's important.

MS. KORSNICK: Okay. So, again, we are not asking for any changes to technical requirements for the 13-109 and the schedule changes that may be needed for Phase 2 compliance we talked about for severe accident water addition.

And schedule changes for severe accident water management will be determined on a plant-specific basis once the guidance is approved.

MR. KRAFT: Right. So, we're trying to take advantage of the permissive nature of the water to avoid a revision to the technical, you know, what that

appendix in the water is.

MR. DAVIS: Uh-huh.

MR. KRAFT: And the way this is written and the way this suggests that we're pretty confident on water addition we need to confirm with the industry.

We're also pretty confident water management will meet the schedule with adjustment. That was the case here.

I really recommend NRC not attempt to revise the technical requirements of that water. Because once you open something up, you don't know where you're going to go, right?

And so, I think to rely on the fact that it is a permissive and we'll do it in guidance, you guys get to approve the guidance, I mean, so that's our preferred pathway forward on it.

MR. SZABO: So, then are you guys envisioning then codifying this through the regulations with the requirement, or are you just - or is your idea just to have this - is the thought that this would then be removed from the rulemaking and just kept in -

MR. KRAFT: Well, that's a real good point, Aaron, because it goes to process inside this building that I am not an expert on. Because it gets, I think,

confused in the consolidated rulemaking as well. Because remember we recommended moving the water into the - the vent water, at least Phase 1, into the consolidated rulemaking.

Our vision right now of rulemakings that codify water is they simply repeat the order requirements with whatever other stuff you put in rules, you know, that then go in orders like inspection, whatever you put in there, but not to alter technical requirements, okay.

The, hey, we had a rethink, that doesn't work because we're all committed to doing certain things right now.

So, the answer to your question is that it could be in the rulemaking whether it's its own rulemaking or in the consolidated, but the technical requirement doesn't alter.

And one thing we've been talking about internally about the consolidated rulemaking in general is, what will we do with all the guidance?

Clearly we don't want you to take all the guidance and try to write it into a reg guide. Maybe we'll give you a crosswalk document, you know, something that brings in all the guidance documents we've written

and attaches them to the new consolidated rule, but the concept could apply here as well whether it's in the consolidated rule or elsewhere.

And that's the reason why on that side-by-side slide we didn't put the process on the resequence, because we weren't a hundred percent sure how that played out.

MR. DAVIS: But, I mean, what you're saying is you're okay with the order as written and that it's permissive on water management and that you want to go down that path, essentially.

MR. KRAFT: Yes.

MR. DAVIS: And the thing you're really asking for is the way you go about it, the sequencing of it is different than perhaps what?

MR. KRAFT: How we develop.

MR. DAVIS: Right.

MR. KRAFT: Right.

MR. DAVIS: And the requirements for that, the requirements for water addition/water management would be in guidance.

MR. KRAFT: Correct.

MS. KORSNICK: That's correct.

MR. FULLER: You intrigue me a little bit,

Steve. By what you said, are you thinking that it might be that you might be beefing up NEI 14-01 if we take a different tack than we've been taking already?

MR. KRAFT: If the SAMGs change through EPG/SAG, I think they would look at that and say, hey, maybe there has to be an increase in that.

That's not my document. So, I can't swear to what we would do about it.

MR. FULLER: Because I'm on the Consolidated Rulemaking Working Group and that's one of the documents we're looking at. And was it 13-06, I guess, is -

MR. KRAFT: 14-01 and 13-06, correct.

MR. FULLER: Yeah, we're looking at both of those.

MR. KRAFT: Right.

MR. FULLER: And I know you guys are looking for endorsements of those.

MR. KRAFT: Well, at the moment, Ed, the vent water in any version is not in the consolidated rulemaking, right. So, at the moment -

MR. FULLER: Right, it's not in there.

MR. KRAFT: Not in there.

MR. FULLER: Period, yeah.

MR. KRAFT: So, you know, you're doing what you're doing, right? And so, if at some point NRC makes a decision to include, then I think that's a fair thing to come back to us and say, okay, don't you think X needs to be revised, right? And that's the way I would handle it.

But internally we've not gotten to the point where the - how can I say it? The people who do the EPG/SAG guidance that leads to SAMGs have not dealt with this yet.

So, we don't know what they might recommend. And then that flows through all the other - all the other documents. So, that's the best answer I can give you.

MS. KORSNICK: So, we're open on it -

MR. KRAFT: Yeah, open on it.

MS. KORSNICK: -- would be the bottom line. Haven't really fully thought that through. I think there's some flexibility there.

MR. KARIPINENI: The dates you are proposing on the strategy, I don't think they align with the order. So, there's some question that the order may have to change.

MR. DAVIS: They don't align with what?

Sorry, Rao.

MR. KARIPINENI: With the order. With the order.

MR. DAVIS: With the order.

MR. KARIPINENI: You were thinking that maybe both addition and the strategy could go in under the present order.

MR. DAVIS: Right and I think they were saying that the strategy may -

MR. KRAFT: I don't think the strategy does. The hardware, we think, does.

MR. KARIPINENI: Right. Okay.

MR. KRAFT: That's why we're hoping that -- we've got different dates. Yeah, we understand that, Rao.

MR. KARIPINENI: Right. Okay.

MR. KRAFT: Let me ask you a question. One thing we hadn't thought about doing, would you be open to our suggesting if this set of deliverables was acceptable, assuming, would you be open to us giving you a red line change to the order and say here's the minor changes we make to the order to comply with this? Would that be helpful?

I mean, because you want to get everything

-

MR. KARIPINENI: It may be too early for me to give you an answer on that. I'm sure that you will have an opportunity to discuss that in the meetings.

MR. AULUCK: We need to save to another year.

MR. KARIPINENI: Yeah.

MR. DAVIS: We'll take that offline.

MR. KRAFT: Fine. Because you've made a point here about how well you align -

MR. KARIPINENI: Yeah, I'm trying to understand --

MR. KRAFT: No, no. And we didn't intend that.

MR. KARIPINENI: You didn't intend, okay.

MR. KRAFT: And, by the way, if you look down in the column called "NEI," that sort of gives you the hint because what items are we including in 13-02, which is direct guidance -

MR. KARIPINENI: Right. I notice the different number you put in there.

MR. KRAFT: Yes, on purpose because it was a different timeline, you know. It's a different kind of thought process.

MR. KARIPINENI: Okay.

MR. KRAFT: It could have been another appendix to 13-02, but we felt, you know what? It's different enough.

MR. KARIPINENI: Okay. On the schedule slide, I just want to make a minor point. You didn't necessarily eliminate the drywell yet.

MR. KRAFT: No.

MR. KARIPINENI: So, the drywell schedule is not affected by this.

MS. KORSNICK: Well, it depends. It depends on the understanding around temperature. I just want to be clear.

We see a path to having these dates met if there is alignment on the temperature. If there's not alignment on the temperature such that it involves a lot more of the analytical work that we're proposing through the water management strategy, then drywell vent dates will be affected.

MR. KRAFT: Let me ask Ed is there - without putting you on the spot, is there a way that we think we could get to alignment, or are we a long ways apart?

MR. KARIPINENI: I don't think - I don't want to say that we're a long ways, but we are certainly not in alignment yet by the simple fact that I see

numbers here that are contradictory to the analysis we are doing.

(Simultaneous speaking.)

MR. KRAFT: But that - okay. I'm reserving to have this argument at some other date.

MR. KARIPINENI: Yeah, that's fine.

MR. KRAFT: The fact that Rao was saying these numbers are not consistent with the analysis, we maintain they are consistent with analysis because they are design numbers and plops us right -- it's like right where we left off.

MR. DAVIS: Yeah, no, what I was trying to see was to find out how far apart we are. And if we're a long ways off -

MR. KRAFT: I think it takes some -

(Simultaneous speaking.)

MR. KRAFT: I mean, we could write -- we could write drywell criteria on the original schedule that we gave you guys. Fairly simply matter, but you end up with temperature regimes well beyond anything that is commonly available.

MR. DAVIS: Right.

MR. KRAFT: And then add to it the "reliable" word and, you know, reliable systems operating at a

thousand degrees. I don't know. It's a challenge, right?

So, that's the point we're trying to make.

MR. DAVIS: Gotcha.

MS. KORSNICK: And I guess, you know, let's go back to the safety benefit. It's a challenge, you know, and obviously if needed it's not to say that that's not something that we could somehow figure out.

But the point is that while you're doing this other work and you're informing yourself as to why would I need that significantly over-designed thing because now with this water in the picture I don't need that.

And so, then it creates connectedness. So, you know, I guess the way I would say it is, you know, with some assumptions if there could be an alignment here, that would be one thing. Other than that, we're going to get into, I'd say, very detailed analytical work and then it's going to be interwoven in with the strategy piece.

MR. DAVIS: Maria, how - what's our margin of time, if you will, before that schedule can no longer be met if we can't agree on the numbers?

I mean, are we talking months? Are we

talking weeks?

MR. AMWAY: Well, if I could answer that -

MR. DAVIS: Thanks.

MR. AMWAY: -- we're looking at having to have the guidance in place for Phase 2 from the industry to your staff no later than November of this year in order to meet the current milestones to have the ISG issue --

MS. KORSNICK: In March.

MR. AMWAY: -- in March. And then, you know, because there's going to be, you know, public comment periods and things like that.

MR. DAVIS: Right.

MR. AMWAY: So that we can then turn that around and do the workshops and what we need to do to submit an OIP by December of 2015.

So, right now I tell you November. We have to have our portion of 13-02 done and ready to deliver to you for -

MS. KORSNICK: Yeah, but listen to what he said though. Would need alignment well in advance of November -

MR. DAVIS: Yeah, well in advance of that.

MS. KORSNICK: -- because you've got to be

writing it.

MR. AMWAY: Yes.

MS. KORSNICK: So, I mean, I would say that -

MR. KARIPINENI: We're coming to alignment a little bit here, but you were supposed to start with that with 545, right? Number change to -

MS. KORSNICK: Say that again. I have a hard time understanding you.

MR. KARIPINENI: What I'm saying is the order and the ISG right now has 545 degrees for the drywell vent. And it is supposed to be -

MR. KRAFT: Only for the first connecting component.

MR. AMWAY: No, only for the common sections of piping.

MR. KRAFT: Yes.

MR. AMWAY: The actual drywell vent valves themselves is not yet defined.

MR. KRAFT: Yeah, you limited that 545 to that first connecting -

MS. KORSNICK: First component.

MR. KRAFT: The pigtail and the valve.

MR. KARIPINENI: How does the common section

of piping getting even to 545? The section off-line section doesn't get to 545.

MR. AMWAY: Well, that's how we ended up leaving the Phase 1 is -

MR. KARIPINENI: We always thought the common section is 545. You're already willing to design the up front portion of the drywell vent be a higher number than that.

MR. KRAFT: The 545?

MR. KARIPINENI: At least 545. So, I'm seeing a disconnect there.

MR. KRAFT: Whoa, whoa, whoa, whoa, whoa. Back that one up, Rao.

MR. KARIPINENI: Okay.

MR. KRAFT: Am I to understand that in the ISG where you agree to for the purpose of the first connecting components, which, you know, a pigtail and a valve, let's just call it that, so we could design those into the wetwell vent system at 545, that was dependent on an assumption on your part that because you can't get the 545 degrees in that part of the pipe, but you can above -

MR. KARIPINENI: Right.

MR. KRAFT: -- that we were telling you we

would design that above?

MR. KARIPINENI: Yeah, the -

MR. KRAFT: No, we were never telling you that.

MR. KARIPINENI: Well, but why did we put the drywell temperature at 545 for the drywell portion of the vent, okay?

We said, you know, we need to get to some number for the common pipe.

MR. KRAFT: Correct.

MR. KARIPINENI: And we gave a high number, which is 545. That was clearly the understanding that the drywell vent be at least 545 or maybe even more than that.

MR. KRAFT: No. You go back to the discussions we had in front of the ACRS.

MR. KARIPINENI: I will.

MR. KRAFT: We were trying to show that we were within -- 545 is the design point got you the operating regime you needed by all the data that we put together based upon NRC's own research.

We never - no, sorry, we never agreed that we were -

(Simultaneous speaking.)

MR. SZABO: There seems to be -

MR. KARIPINENI: Some disconnect here because -

(Simultaneous speaking.)

MR. SZABO: So, the question is, what time - when is the -

(Simultaneous speaking.)

MS. KORSNICK: July-August time frame.

MR. SZABO: Okay.

MS. KORSNICK: We're here. We're here now.

MR. AMWAY: And that's assuming we follow the drywell vent path that we would, I mean, because there are the two options that if you do the water addition, the strategies option -

MS. KORSNICK: Then you don't need the -

MR. AMWAY: -- then I don't need to necessarily solve that right now. But under the current framework of what we're required to do in the schedules, you need to have both at the same time.

MR. SZABO: Gotcha.

MR. AMWAY: So, that's the reason why that's in there.

MR. SZABO: Yeah, all right.

MR. AMWAY: And the key point with the drywell vent, really, I mean, I'm not going to argue about the temperatures right now, but the design temperature requirements for a drywell vent if you have water addition are going to be lower than if you don't have the water addition, because you can see that in the analysis the temperature in the containment are much higher if there's no water addition.

MS. KORSNICK: Clearly significant, right.

MR. SZABO: Okay.

MR. DENNIG: In my mind, we did what we did to reserve the possibility that that 545 temperature might change whether up or down, but we didn't know enough at the time to specify it. And we will get a lot smarter in a few months and then we can be done with that.

MR. KRAFT: Well, I agree with that. And it was to me, a way to close off the wetwell vent so we could design something, right?

MR. DAVIS: That's right.

MR. SZABO: All right. So, we definitely need a public meeting sometime soon to discuss this. We'll just move on to the next -

MS. KORSNICK: Okay. With that, I'd like to introduce Phil Amway and he'll go into some more details

on the proposal for Phase 2.

MR. WANG: Before that, I have a question. Did I hear you say you expect to present the ACRS on the Phase 2?

MR. KRAFT: I think we're away from that, Weidong. I think we need to do a lot more work in the industry and probably in NRC staff as well before that commitment.

Does the ACRS have a notion as to when they want to have that presentation?

MR. WANG: No, we don't. I just wanted to --

MR. KRAFT: No, no, no, it's good to put that out there. I think that it would be very valuable to go through the ACRS, but we're not at all ready.

MR. WANG: That would be great.

MR. KRAFT: So, let's just keep that in our mind. Okay. Thank you.

MR. AMWAY: Okay. Good morning. This is Phil Amway. I'll start right in on slide two seeing the topics we want to go through in this presentation.

I'm going to start off with a refresher. Just go back over and see what the two options of Order 13-109 state for Phase 2.

We'll look at what's currently in 13-02 guidance relative to Phase 2. Just a recap of the rulemaking insights. So, we won't have to spend much time there. I think Maria's already covered that.

Then we'll go into the industry proposal for Option 2 of Phase 2, what the key elements of that look like and what our path forward and schedule are.

So, in Bravo 1, the first option of Phase 2 is that we can install a drywell vent. The vent has to be able to vent the containment atmospheric control pressure within acceptable limits and it has to be done under severe accident conditions.

Essentially, the drywell vent will meet the same functional requirements as the wetwell vent that's contained in Section Alpha, and also the quality and problematic requirements that are designed for the wetwell vent.

In Option 2, we have the option to develop and implement reliable containment venting strategy that makes it unlikely that a drywell vent is needed.

And then there were some sub-bullets under there, some elements that we would have to meet in terms of that the strategy has to be part of an overall accident management plan. And, you know, we see that

as some of that is accomplished under Phase 2 with the hardware installation. Some of that would be accomplished under more of the strategies aspects as we get more informed out of the rulemaking.

We have to be able to provide supporting documentation to show that the containment will not fail due to over-pressure without a drywell vent.

And so, that assumes that we would be able to continue using the wetwell vent to provide over-pressure protection for the containment.

And then lastly, we have to be able to implement the strategy using our procedures and installed or portable instrumentation and equipment.

The only guidance we currently have at NEI 13-02 says that our Phase 2 activities should be informed by the rulemaking analysis we're currently performing.

And originally at the time, you know, just to backup in history a little bit when the order - when the SRM originally came out, the order and the rulemaking was set on a path where we would have the analysis from the rulemaking earlier than we currently have it. And that would help us inform the Phase 2 discussion.

And for, I mean, we've all been involved in the same public meetings. We know how that's progressing, but now that is, you know, nine months further out.

So, you know, the learnings we're actually getting from the rulemaking while valuable for the Phase 2, are lagging behind that original schedule.

So, you know, there is some concern there. This is the right thing to do, but it's a timing sequence problem.

The rulemaking insights, the technical work is progressing on the rulemaking. As we've already stated that the severe accident water addition has the greatest safety benefit and should be pulled up earlier. And that there's a significant impact on the safety benefit of the severe accident vent by being able to provide that enhanced water addition capability.

Other strategies have secondary impacts on safety and those things would be whether you cycle the vent in a pressure vent, or open it and leave it open, whether you attach a filter to the end of the vent line and other water management strategies.

I mean, we looked at the chart we saw yesterday that showed the relative differences in

safety between our base case with just the vent compared to the water addition being significantly lower.

MR. FULLER: Excuse me, Phil.

MR. AMWAY: Yes.

MR. FULLER: What you just went through is all well and good, but I think, you know, if you want to step your toe into the water management pool of water, so to speak, you ought to at least be able to say where you're adding the water without getting into details of flow rate or strategies vis-a-vis venting activities as well, but you really need to say I'm going to put it in the vessel or the drywell or perhaps the wetwell, but we know from filtering strategies that putting it in the wetwell is less effective in terms of -

MS. AMWAY: I fully agree with you and that would be part of what we would define in our Phase 2 guidances.

And when I say where, I would keep it at that level either RPV or drywell, not specifically it's got to be at this elevation or it's got to be, you know, any particular area of the containment. It's just it has to be in there at some delivery pressure and flow.

MR. KRAFT: Right. The definition of safety accident water addition from pervious SAG RPV

were drywell, right?

MS. KORSNICK: Uh-huh.

MR. AMWAY: You'll, see that in -

(Simultaneous speaking.)

MR. SZABO: Okay. So, that's what you're picturing for the November - I'm not trying to - I just want to make sure you guys aren't going to come in with an it should always be. It's going to be much more general.

MR. KRAFT: Well, I think that there is something to be said for preferentially reactor vessel, but that may not be possible for a variety of reasons.

And we wouldn't want to hamstring people, right. Every plant is different, but I think it would either - it would be guidance on how you do it and I'm imaging there would be some choice involved in certain analysis, you know.

MS. KORSNICK: So, there's guidance on where you would put it and there's different benefits depending on where you put it -

MR. KRAFT: Right.

MS. KORSNICK: -- I guess would be the best way to say it.

MR. KRAFT: Right.

MS. KORSNICK: And then depending on your design and your issues, you might want to pick one over the other and you just have to appreciate where you put it. The benefit you get depends on where you put it.

MR. KRAFT: Right. I mean, if you're going to make sure you're putting it in the vessel and there are complications with doing that that are not there if you just put it in the drywell, you can arrest the progression of the accident perhaps earlier which may have a benefit. So, you have to look at all of that.

MR. FULLER: Well, all of that comes out of the filtering strategies activities.

MR. KRAFT: It informs it.

MR. FULLER: Yes.

MR. KRAFT: No question. Absolutely.

MR. DAVIS: Do we run into problems where you do that and then later on when you're doing your water management you'll be like, wow, it would have been -

MS. KORSNICK: I picked the wrong spot?

MR. DAVIS: Yeah, it would have been better to do this or would have been -

MR. KRAFT: That's where the hardware part - that's part of where the hardware part comes from and you have to think that forward.

(Simultaneous speaking.)

MS. KORSNICK: We seek to minimize that. I think we will be able to appreciate, you know, big flick here or there.

MR. DAVIS: Okay.

MS. KORSNICK: Even though it's going to take you more time to do the more detailed analysis once there.

To your point, you know, could you miss? Yeah, you could, but I think we'll have a pretty good feel of whether you want it in the vessel or the drywell in order to, I mean, ideally, like I said, ideally, you know, we could keep them together on the same timeline.

I just think that we're trying to work very hard to challenge ourself to say, you know, if you can get close enough to know, then why can't the water addition be sooner. And we feel pretty confident we can -

MR. DAVIS: Okay.

MR. KRAFT: For example, if you've got a plant where getting water into containment through a method that's not, quote, hardening a FLEX connection, that may not be to the reactor vessel, but you could do it real easily.

And then when you get to the water management part, you may conclude, you know what? I really need water in the vessel. That's a hardware change on the - you've met the water addition challenge --

MR. DAVIS: Yes.

MR. KRAFT: -- but it may not be exactly where it should be, but you didn't pipe it anyway. It was some other thing you did preferentially powering a pump, for example.

MR. DAVIS: Yes, okay.

MR. KRAFT: Versus -

MR. AMWAY: And if you look at the spectrum of plants that are out there, there's 31 plants, okay. And the vast majority of those have already charged systems that you tie into a common injection point and you power valves and I can go to the RPV, I can go to the drywell, I can go to the subchamber just by which valve I do.

Now, there's other plants out here that don't have that RHR system that have a separate containment spray. You'd have to look at those independently. Then there's other plants on this side of the spectrum.

But, I mean, if you just look at that overall view, that really shouldn't be a big concern about, you know, do we really have to have it in the RPV or do we really have to have it in the containment.

I do agree with you, Ed, that, you know, we're probably not going to find that adding water directly to the subchamber or suppression pool is going to produce what we want. It's either going to be to the RPV or it's going to be to the drywell.

MR. KARIPINENI: A side aspect of this whole venting strategy is how to take care of hydrogen, too. And that often play a role in the decision we're going to make. How do we accomplish that? I just want to bring it up.

MR. KRAFT: Well, at the moment you're relying on steam -

(Simultaneous speaking.)

MR. KRAFT: So, I think if that's what you're relying on, you're going to have to figure out how to make that work.

MR. KARIPINENI: We did bring up the possibility that you may have a stagnated hydrogen in the upper sections of the drywell and the analysis that your guys and our guys will be doing should address that

issue to see that is a concern or not.

MR. KRAFT: Okay.

MR. KARIPINENI: What would be the concern. How do you get it out? Things like that.

MR. AMWAY: All right. The next major bullet on this slide is whether a drywell vent is needed depends on the water management.

And I have in quote there "accident management." Because if you go back and look at the order language, it talks about part of an overall accident management plan. And I see that the water management is an integral part of overall accident management.

And whether you have the water addition or not, it helps to define the functional requirements of the drywell vent. We've already had considerable discussion on the design temperature. I won't go into that further.

But the vent size, if I can delay my need for a drywell event for 48 or 72 hours, right now the rule says I have to be able to pass one percent capacity.

Well, if I'm 72 hours into the accident, my decay heat load is lower and so I could adjust that vent size.

The order as it exists does allow us to use

a smaller capacity if we can show that it's adequate based on the timing of when it would be needed. So, that would also have it.

And then the overall severe accident capability brought up, you know, the hydrogen aspects, detonation of - in the vent pipe. So, all those things together would influence the design parameters for the drywell vent.

Moving on to the next page, the major elements we see in Phase 2. Under the severe accident water addition, by controlling the water addition rate, we expect to be able to extend the use of the wetwell vent path. And by extension, you know, it's possible to significantly extend that vent path.

I think in all of our analysis, we're using 500 gallons a minute at 150 PSI sort of as our base assumption for the analysis for how much we need.

You know, whether you actually need 500 or not, is 300 okay? Our analysis would help us inform that, because the goal is to be able to add enough water to be able to protect your containment from over-temperature conditions while at the same time not filling it so fast that you lose that drywell vent path.

And, in theory, there's an equilibrium -

SPEAKER: Wetwell.

MR. AMWAY: Wetwell vent path. You're right.

And, in theory, there's an equilibrium there. If I add X amount in, then X amount is going out the vent and wetwell level is constant.

You know, will we ever functionally achieve that? Well, maybe, maybe not depending on how much instrumentation we have available. But we can certainly postulate, okay, if we restrict to us maximum flow rate, we know we have at least this much time where we would be able to use that wetwell vent path.

We would have to be able to support that addition within the procedures and I have the EPG/SAGs here.

Under the severe accident conditions, obviously we're going to be in the SAMGs at that point and to make sure that our procedures support this water addition strategy.

And then part of the overall accident management plan may be further enhanced by the rulemaking.

What I'm looking at here is the water management part of Phase 2 with the hardware we're going

to install is going to give us that time of extended use of the wetwell vent.

We may find as part of the rulemaking analysis that there's other water management strategies that come out of filtering strategies that may make further refinements and enhancements to the SAGs. And then those things would be, you know, as a Phase 2, you know, or Phase 2 of the Option 2. And that's what we spoke of as being a later time frame towards 2017 to figure out what those specific SAG changes are.

Some of the hardware aspects, and this will address some of the questions that we've had, what we're looking for, the hardware aspects in terms of being severe accident-capable is we're going to have to define the addition point as being either the RPV or the drywell or some, you know, flexibility in there that some plants it may be better to inject to the drywell. But, you know, we would have guidance on, you know, use of either of those two addition points.

The water addition pump itself, we would want to define what the delivery pressure and full requirements are for the pump and the timing, you know. How soon would we actually have to have that source lined up and available?

The motive force, you know, there's going to be electric power involved. There's going to be, you know, diesel-driven pumps most likely is the portable pumping we would be using.

Steve mentioned we may choose the power of an electric pump, but, you know, that all goes into the motive force category that we would have to define in the guidance.

Similarly, the instrumentation that would be needed to support the water addition in Phase 2 and the severe accident considerations.

And what I'm looking there in terms of severe accident considerations are the temperature and radiation conditions that may exist under defined severe accident conditions to make sure that it's achievable to actually perform the actions and use the hardware that we would put in place.

MR. FULLER: Would you have some activity here regarding instrumentation and severe accident conditions to, first of all, determine if you need new instrumentation, perhaps, regarding the water addition activity and regarding the severe accident capability of, you know, the whole reactor whether or not you can have the instruments that you might need withstand the

harsh conditions.

In other words, do you have to beef them up?

MR. STURZEBECHER: You know, if we're going to do severe accident level, are we back to the same scenario we do with hardened vents where you're talking safety related, or are you going to go with the next level because, you know, something is standing alone?

MR. AMWAY: Well, I think you've got to break that down into pieces. The Phase 1 instrumentation is already defined and we're putting that in. And that's, you know, severe accident-capable as we've defined in the guidance.

In Phase 1, we are already in our guidance talking about the use of containment parameters that we are assuming get repowered under FLEX, but would still be available under the severe accident conditions for the purpose of monitoring the containment.

If we were looking at this Phase 2 and we were going to go into an RPV injection point, we would probably want to do - look at, you know, RPV pressure to make sure that, you know, the RPV pressure is within the capacity of the pump.

Now, most plants, and I won't say all, but

most plants have Reg Guide 197-qualified instrumentation for things like RPV pressure. Plants that were pre-Reg Guide 197 have done certain evaluations to make sure that their instrumentation is useable under severe accident conditions.

I don't see at this particular point Phase 2 including any changes to existing installed plant instrumentation as it relates to either RPV or containment monitoring.

We would have to define what that set is and to make sure that it's addressed under, you know, we've already defined under Order 49 guidance what is essential instrumentation for monitoring and pull that forward in and say it also applies under this Phase 2 strategy.

MR. FALLON: Phil, just one addition. Severe action water management may prescribe other instruments though. So, that's -

(Simultaneous speaking.)

MR. AMWAY: And that's just what I'm thinking here in terms of these are the things I know I need as we develop the guidance between now and September/November time frame if there's other things, but, you know, in general I would say we would use, you

know, we would make every attempt to use what's already available, just define what that set of instruments are.

Now, in rulemaking, you know, the possibility is one of the things we looked at - and if we looked on the chart, there was a hardware item component coming out of the rulemaking. And that's what we had stated is, you know, maybe under rulemaking there is some defined instrumentation hardware changes that would be required. We just don't know yet.

But under Phase 2, I am not planning on making any changes to existing hardware for instrumentation.

Moving on to -

MR. SZABO: Sorry. I haven't been involved with the other ones, so this is more -- sort of, why I'm writing down to make sure they're addressed properly. So, in November for your guidance document, are you guys expecting to have details on this, or is it going to still be at a much higher level?

MR. AMWAY: We would have - we would expect to have enough detail on this that the plant should go out and choose their injection point and follow these, you know, other parameters to make sure that they could comply with what we're defining as Phase 2.

MR. SZABO: Okay. Thanks.

MR. AMWAY: Yeah, it's not - it wouldn't - all I'm trying to do right now is if you look at this in terms of a scope because Phase 2, you know, has some flexibility in it, we really need - the first thing we need to do is accurately define what is the scope of things we're going to go do before I go write a bunch of guidance on how to actually implement that scope.

MR. SZABO: Yeah, it was more of just with the due date of November, I was -

MR. AMWAY: Right.

MR. SZABO: -- just wondering. I didn't know.

MR. AMWAY: It's a tight schedule.

MR. SZABO: Yeah, yeah.

MR. AMWAY: You know, until we agree with this approach in Phase 2 filling out the details and Pat and I are already starting to work on it based on, you know, our current understanding of the things that we should do, but this other portion on the scope really needs to get nailed down.

MR. ESMAILI: Just one clarification. Is the preference always RPV injection if you could eventually inject into RPV, or is there other conditions

where you might say inject into RPV, but I could inject into the drywell?

MR. AMWAY: Well, if you look at the analysis we've done so far, there's across the board marginal benefit to RPV injection.

You know, one of the reasons there is because if you do it into the vessel, you're also getting a benefit of cooling whatever residual core debris is still in the vessel and providing that cooling, which is helping your overall containment temperatures.

MR. ESMAILI: But the first attempt is always to inject into RPV, because we don't know how things are progressing. We don't know necessarily when the lower head fails or there is a possibility that it can -

MR. AMWAY: And a lot of the pieces if you do it, I mean, the dominant sequences that we've analyzed so far is it improves your possibility of in-vessel retention.

And if you're not going to inject into the RPV and you're going to go right to the drywell, then in-vessel retention is off the table. You're not going to get it.

(Simultaneous speaking.)

MR. AMWAY: That's right. The path forward, next slide, right now we don't anticipate any schedule changes needed to implement Phase 1.

We are seeking to achieve the NRC and industry alignment on water addition strategies, you know. We're having these meetings. I know Maria has been doing a lot of work in the industry at her level.

The BWROG has also seeking to align the BWROG members, we discussed at our last BWROG meeting, we're having additional meetings on a regular basis to make sure that, you know, everyone is aligned with this approach in Phase 2, you know.

Assuming that we are able to achieve that alignment for Phase 2, we expect that we would be on a path to be able to implement Phase 2 on the current schedule, which is -

MR. KRAFT: Well, Phase 2 water addition.

MR. AMWAY: Phase 2 water addition, right.

MR. KRAFT: We left that off that bullet.

MR. AMWAY: That's right. Phase 2 water addition on the schedule 2018 to 2019. And what we're seeking to do on this path forward is to use the water addition strategy as an acceptable option to fulfill the Phase 2 requirements for the water addition

understanding that there are some other management pieces that would fall out into a later time frame.

Agree to the proposed Phase 2 guidance schedule for severe accident water addition. And I have a schedule outlined on the next page we'll get to.

But then lastly, begin the process of developing guidance - the guidance schedule for severe accident water management.

Next slide. And here we have just as an overview, what you see in the tan or peach color, those are what I consider current hard dates in terms of the existing schedule. And it's actually written into the order that by March 2015 the NRC is to issue an approved ISG for Phase 2. And in December 2015, the licensees are to submit an OIP for Phase 2 to the NRC staff.

The other things are positioned in here to support those two key milestone dates. And this is a very similar schedule to what Randy Bunt had presented in earlier meetings.

What's really different is in these first two items between now and the end of July looking to nail down what the Phase 2 scope is, that's really what we're talking about today understanding there will be some additional discussion and alignment between now and the

end of July.

We need to have that alignment on the Phase 2 scope in time to actually develop the guidance. That's what the next step is here, is to be able to draft the initial guidance in 13-02. And obviously that's going to take, you know, we review our progress at public meetings to make sure that everyone is still aligned with what we're writing in 13-02.

By August, the working group would want to have the guidance in 13-02 pretty well defined and looking at broader industry alignment and feedback on that guidance with the objective of being able to deliver the revised NEI 13-02 to the NRC staff to review and endorsement by reference in an ISG.

We acknowledge that you're going to have a public review and comment period that we'd expect to finish by February 2015 and that you would be able to meet the milestone of March of 2015 to issue the ISG.

The other ones there later, there's really no changes there from the last time we talked. We want to use the same types of process we did for Phase 1. We think that worked very well where we developed - the industry developed an OIP template for Phase 2.

We select a couple of pilot plants. We

have pilot plants fill out that template. And then we review that, you know, at public meetings with the staff. And that's a process that worked very well in Phase 1.

You know, I just held a meeting last Friday with a lot of different sites that asked some final questions on the OIP. And they were really just some minor clarification questions and we were able to answer all those.

And all the sites are in - the licensees are in good shape to make that submittal by the 30th of this month. So, we just wanted to use that same process with the workshops and the pilots that we did in Phase 1 and carry that forward into Phase 2 with the ultimate of being submitted by December '15.

MR. KRAFT: So, before you ask the question, how does this list relate to this? And the answer is if you look in this draft chart that we had on strategy, which is a separate NEI document - so, this is about 13-02. We - in the template, we would provide guidance for people to point to the strategy development in the OIP for the water with certain, you know, quote, blanks to fill out going forward. And I would imagine a revised OIP at the time the strategy gets implemented,

Jack, I don't - I wanted to show you how this related to this.

Because the one thing that's in here is that strategy thing goes out and of course at the drywell vent criteria, that may flow down as well at some point. That's something people want to eventually do.

(Simultaneous speaking.)

MR. KRAFT: Right. But we would have pointers in it so no one forgets about it and it's clear what you guys reviewed where that's going to go.

Because we, again, as Maria pointed out, we're trying to get the ability to put water - add water without really knowing a heck of a lot about the strategy. Because it's just you can get to that much more quickly.

And I would never suggest that simply getting water addition meets compliance of Phase 2. Fully aware of what that requires, but this is a water addition schedule, not a full-blown - I just want to make that clear, because it just - listening to the few presentations, you would automatically trip to that disconnect. And I wanted to just kind of mention it up front how it connected.

MR. DAVIS: So, my comment earlier was that

I can't really schedule reg views when they would come into compliance.

Not everybody is all in the '20-'19 refueling - they're all on different ones. So, they'd be coming into compliance in a staggered fashion.

MR. KRAFT: Right.

MR. DAVIS: Then you said earlier, though, that they'd have to get approval of their SAMGs from the owner's group and so on.

MR. KRAFT: For the water management.

MR. DAVIS: For the water management, correct.

MS. KORSNICK: Uh-huh.

MR. DAVIS: Okay. So, for the -

MR. KRAFT: By the way, the current SAMGs based upon EPG/SAG Rev 2 -

MR. DAVIS: Right.

MR. KRAFT: -- not even Rev 3, already has water addition.

MR. DAVIS: So, for the water management strategy, though, they would all - like there wouldn't be anybody that would be coming into compliance earlier than the '19-'20 or the '20-'21 date.

MR. KRAFT: I think that's correct.

MR. DAVIS: Okay. I just wanted to make sure I was clear.

MR. KRAFT: I think that's correct. You know, there could onesie-twosies either way, but, you know, you're really talking about - you think about BWRs. You're talking about two major fleets.

MR. DAVIS: Right.

MR. KRAFT: Right. And then the rest is kind of onesie-twosies, right? So, you're a -

SPEAKER: I'm a onesie.

MR. KRAFT: You're a onesie. And so, who knows what they're up to, but you imagine the fleets all operate within each fleet in unison.

MR. DAVIS: Yes.

MR. SZABO: Okay. Good. Before we wrap up, I wanted to - I'd like to just do the take-aways from the public meeting so we can kind of leave early and make sure we're all on the same page.

The first thing that - I don't know if anyone was able to tell you, Steve, I mentioned this yesterday was your letter mentioned about the dates, the other requests within the letter.

I was wondering if you guys thought you were still - you're on schedule to meet that. I know you

expressed - there was some concern in the letter. I didn't know if you felt that you guys had any idea for dates right now.

MS. KORSNICK: Talking about data collection?

MR. KRAFT: Yeah, data collection. Yeah, I was forewarned you would ask the question. So, I lost a lot of sleep last night trying to figure out how to answer it and I've got a multi-part answer for you.

We obviously submitted the cost estimate. I think there's an open question or two we committed to get - put our heads together and come up with some information. We'll do that.

On the second tranche of data which was the questions for EPG/SAG Rev 3, those - the answer to those questions are in flight. I think the answers are being reviewed by the Owner's Group now.

Terri, is that correct?

MS. FARTHING: Uh-huh.

MR. KRAFT: And we will be getting that to you by that due date. No problem. We are going to, however, answer those questions in a format we think relates more directly to the rulemaking in terms of the scenarios and things like that. That's kind of the

thinking now.

And of course more than happy to have any public meeting you want to go over the answer. So, that's that.

On the data itself, I don't have a firm answer for you on that. We will abide by your recommendation that the Mark II data is preferred earlier compared to the Mark I data. That's certainly something we can preferentially do.

I'm looking at the guy who's helping me with the data collection. I think we'll be - we're kind of in the ball park.

But let me use this as - so, that's the answer. Let me use this as kind of a jumping off point to express a concern.

Okay. I always have reservation about providing hard data. We'll provide it, but my reservation goes this way: As a tendency to look at the data - as there is a tendency to look at operator actions, the discussion yesterday afternoon, in compliance space, not in real operational space, you know, most of the compliance space and operational space are the same thing, you know, you're operating, you know, hot true normal, you're all that sort of stuff,

you get into design basis events, you got all that laid out in front of you.

You exceed that point and now all of a sudden you're in your emergency procedures, possibly into your SAMGs. Operators are not in compliance space. They're in what the SAMGs and EOPs tell them to do, which are things happening more quickly, responding to symptoms, you know, running pipes and hoses earlier.

The OIP for the reference plant that was being used in the analysis does say that the pump is ready to operate in 12 hours, because that's what was required to comply with the order.

It doesn't mean under every circumstance. What it means is that that - we send that in, you look at it, you stamp it "complied" and we're done.

We have EOPs that say, you know, respond to the symptom you're facing. And the symptom says, I got to get that pump in place faster. Okay. Then the procedure tells you to do that.

It's not like you're saying, hey, the OIP said X, so, I'm not going to do anything.

MS. KORSNICK: I think the point you're trying to make, Steve, is in some cases the hours that we put in provide necessary margin for that framework,

but it doesn't mean it can't be done sooner.

MR. KRAFT: Right.

MS. KORSNICK: There's not a limitation that it couldn't be done sooner. You can't do everything at t=zero. So, you lay it out and you say, I need this at 16 hours, I'm going to commit to 12 hours, because that gives me plenty of margin.

But if you're in a scenario where you need it sooner than 12, it doesn't mean that it's prevented from being used sooner than 12. And you'll be responding depending on your -

MR. FULLER: You know, I hear you and I know there would be some training activities going on in this regard.

I'm concerned that the timeline might create a mindset that, you know, a feeling of comfort that if everything goes the way it's supposed to, these times are pretty good.

And I hope that people are dissuaded from that approach and are more on the mindset of let's get what we need in place as soon as possible given the way we have to prioritize our resources to get things in place and not so much say, oh, yeah, I got 12 hours before I need suppression pool makeup.

But, in fact, you might need the -- you may need to have a pump ready to inject water into the vessel at seven hours, you know.

MS. KORSNICK: I mean, we're in severe accident space. Nobody is sitting around saying, I have 12 hours to do anything.

MR. FULLER: But if you -

MS. KORSNICK: That's what the reality is, you know, in terms of that. But, you know, I'll be honest. You don't know what else is going on, right?

You might have fatalities that you're dealing with. You might have, you know, other things are going on.

So, my challenge and I think what Steve is just trying to frame is, and sometimes when you see time frames, there's context around those time frames that we just need to be appreciative of.

In some cases, you're going to commit to something because in that time frame it makes sense and provides the margin you need, but also don't look at it as a hard and fast that it couldn't be done sooner.

Nothing is preventing you from doing it, but you are also giving yourself the operational flexibility to deal with many things that you don't know

what they are yet, right?

And so, it's really just, you know, providing that. And so, I appreciate your - I don't think by any means whenever you're in this space, there's any kind of casual mindset. Let me just leave it at that.

MR. FULLER: Just because RCIC is running at the beginning doesn't mean it's going to keep running.

MS. KORSNICK: Stay running, correct.

MR. KRAFT: I made that as an analogy because I want to make a point about the data. So, we provide you the data and you look at the range of the data and let's pick an important parameter.

How much freeboard do you have to add water to your suppression pool? And you come up with some representative range of numbers. And you run your calculations and you say, you know what? You don't have enough time to fill that suppression pool so you can avoid having a drywell vent. That, to me, is in the compliance space thinking.

Okay. The real benefit of that analysis is to get the insights from it. And the insight might be, hey, you know what? If you can gain another day or two on water addition before you flood out your wetwell

vent, how about that?

Now, company - utilities are going to say, well, I don't have that capability, I'm in this box. But other people are telling me the location of that wetwell vent and particularly the level indicator is there for convenience.

There's no reason why I can't move it up another 10 feet, nine feet and gain that much more freeboard.

That's the kind of insight we would want to have so we can make the system work the best way. So, if you're going to give your data that's compliance space data and you do a compliance space analysis, you'll never find that insight. And that's what we're looking for.

MS. KORSNICK: And that's where you talk about the water management strategy. That's why that's different, because it's going to provide you those kinds of insights.

You're going to try to figure out what degrees of freedom you have and you're going to say, hey, I didn't realize how important the location of this is and I have the ability to move it. Well, maybe I will.

MR. DAVIS: That's what I was saying,

though, before, right, about moving it somewhere, right. That all costs money and time and effort and -

MS. KORSNICK: It costs money.

MR. KRAFT: Becomes a tradeoff.

MR. DAVIS: But becomes a tradeoff, right.

MR. SZABO: I just want to get this situation at least in the rulemaking space and why we use the data that we're using.

And I understand - there's always the understanding that, you know, let's say we're using compliance data. I think, you know, yesterday we were talking about a better life. Reality versus what our regulations were.

Well, you know, as the regulator, as developer of the rule, while we should be putting in caveats that, you know, based on here's our assumption, here's where it comes from, we understand that in, you know, there may be differences; one, between plants, and; two, in reality, unless we have actual referenceable data that says, you know, while we can set this up in this amount of time which we'd be happy to use, we can say we have received comments that they can do this earlier.

But as the regulator and answering to all

stakeholders, there comes into question that unless we can - us just saying we heard this from industry is usually not enough for us to - it will help inform what we're doing, but I don't know if we can necessarily always base what we're doing on just hearing that without any -

MR. GABER: And to that end, I brought this up yesterday, I really would like you guys to take a look at that NUREG because I think it does address a lot of the elements you asked for and it is obviously a referenceable document.

MR. SZABO: Yes.

MR. GABER: So, if you can give me some feedback, give Steve feedback as soon as possible, that would help.

(Simultaneous speaking.)

MR. SZABO: I have that as one of the 13 various take-aways.

MR. GABER: So, just so that you know where we're coming from. It's not that we're saying we don't believe that it can be done earlier.

MR. KRAFT: Aaron, it also explains in advance why your - the technical analysis that is in your regulatory analysis may end up different than ours,

because we're taking a more informed, insightful look at it because we're trying to solve the problem, not just simply doing regulatory analysis.

So, I just weigh that out there that -

MR. FULLER: Are you casting asparagus on us?

MR. KRAFT: Asparagus?

(Laughter.)

MR. KRAFT: I'm casting a difference between the way - and if you're in design basis space even if you're in pre-core melt space, there may be some justification to that.

But once we get off into this really low probability, we're trying to make sure we don't have something really bad happen, but really low probability I think is sort of like my question about what does reliability really mean out in that region?

It comes from a point where, you know, the last thing I want to do is have, you know, we finish this process and we have two competing results. That doesn't make any sense.

MR. DAVIS: Right. It doesn't help anyway.

MS. KORSNICK: It will create a lot of conversation. Let's just say that.

MR. SZABO: Let me just run down the take-aways. The first is, Steve, what you brought up early yesterday was about basically the end game and where we're really going with -

MR. KRAFT: Yes, we'd like to have infrastructure.

MR. SZABO: We're going to have that at the next public meeting. And I'll talk a little more about that in a little bit.

The second is you mentioned take-aways for the detailed cost assessment for you guys, which is the decon costs and the O&M costs. You guys are going to provide the NRC something at some point looking at - I think they're not going to be - they shouldn't be cost drivers, but they're just things that we need for our balances.

The third thing is in relation to FLEX criteria for decision to deploy, the time to deploy. That had to do with HRA.

The fourth thing -

MR. TRUE: You're looking for something in the document that -

MR. SZABO: Yes. Yes.

MR. TRUE: Okay.

MR. SZABO: A referenceable document is always preferred.

MR. TRUE: So, Steve understands the -

MR. SZABO: I mean, if we have no data, we of course will go with comments we receive. But if we have referenceable data, that is always better.

MR. DAVIS: Can I understand what you mean by that? So, you're asking them to provide what? HRA?

MR. SZABO: No, this is to help inform the HRA.

MR. DAVIS: Okay.

MR. SZABO: To help inform the HRA with criteria for the decision to deploy and the time to deploy -

(Simultaneous speaking.)

MR. AMWAY: If we were able to provide that in such a way that it was clear that we were able to deploy and use an injection pump in four hours or six hours, then that would give you enough information to be able to reference and say, you know, go from 12 hours to four for the injection.

MR. SZABO: Yes, yes.

(Simultaneous speaking.) MR. AMWAY: That's right. Yeah, that's very well easy to

define.

MR. TRUE: These are all gone. This is what's left on my list.

MR. SZABO: Number 4 when you talked about the fraction of hydrogen based on location chart analysis. The Mark II bypass is something we're going to be bringing up in the next public meeting to support ongoing discussions on that.

Marty very graciously sent me the alternative sheet that he developed yesterday that no one could really read.

So, there is - everyone should have a copy in the room. I'll of course add that to the meeting summary.

That's not necessarily our final decision on the alternative. We are going to email to Steve where we're - where we believe the alternatives are so that we can continue talking about them in the same framework as well as we're also going to discuss this terminology that you guys introduced today about whether we just want to move to that.

We've had a lot of - I've had a lot of briefings where I've spent 15 minutes discussing - so, yeah. So, we will also have that.

MR. TRUE: A common nomenclature and specifications.

MR. SZABO: Yes.

MR. TRUE: So, when we do our analyses, we're analyzing the same thing and calling them the same thing.

MR. SZABO: Yes.

MR. TRUE: Because we've been changing names and numbers and it's time to nail that down.

MR. SZABO: Yeah. Now, we can go back and check the breakdown of the core debris location based on comments that you guys gave yesterday.

The SRV cycling number, you guys are going to have a discussion offline on that and then we're going to come back and just - at the next public meeting, just make sure we're all on the same page.

We're going to go back - actually, we received an email from My HRA guy this morning, but we're going to provide more clarification on the information necessary that we're really looking for with the HRA to help just inform, in fact, where we are going.

And then of course we're going to be working on the mapping for the Mark II as well as hopefully making presentation at the next public meeting on that.

And we are having a presentation on the MAACS at the next public meeting which will be done by, I believe, John Barr. And I haven't had a chance to talk to him since yesterday, but I'll find out whether we're far enough along with the Mark II development and whether he can present to that data.

And then of course the last thing from today is this might be separate or we can combine the two kind of what we did today. Some public opinion on the temperature for the drywell vent.

MR. KRAFT: Well, okay. I wanted to talk about that for a second. I don't know that that's really right for a meeting.

MR. SZABO: Oh, okay.

MR. KRAFT: All we'll do is argue over the temperatures and what you meant when you wrote what you meant in the ISGs, which I just looked up and inconsistent with what you said. So, I'm not going to get into that argument. I'll show you the ISG, but I don't want to have any more arguments.

Let's go home and do some homework and then come back. And we may have to - you may have to do some strategy development before we come back and say this is why we think this is the right temperature.

All you'd be doing is arguing on number without any real basis for the -

MR. DAVIS: But I thought you were indicating it was critical that we solve that by August.

MR. KRAFT: It was. It was. If you want to accept those numbers, we're done. But you're not. So, we're not.

MR. DAVIS: I'm hearing you, but going out and doing something means it takes time.

MS. KORSNICK: I think the point though is just form all the different dialog and I'm sure all the same players were there, but I do think, Steve, there's value in having conversation to at least agree on, you know, where these came from and what they - and what they meant to say, in fact, we are at an impasse and more work needs to be done and, you know, it doesn't have to be a long, drawn out affair, but I think we need to launch from the same ground there.

MR. AULUCK: One thing I will take from today, Steve, from today's meeting, the major changes this Phase 2, where it says water reaches acceptable options. So, that's the big change from the order requirements.

MR. KRAFT: No.

(Simultaneous speaking.)

MR. KRAFT: No, no, no. We said, Raj, more than once, we understand that simply getting water addition is not compliant with Phase 2. It requires the strategy part which is on - okay. So, you may not get full compliance with Phase 2 by those dates, but you will get - we hope at least get water addition.

MR. SZABO: So, I assume, Steve, just that was a typo on this slide, this path forward where it says water addition --

MR. KRAFT: Yes.

MR. SZABO: -- is an acceptable method, that really should have been water management? Water addition and water management is the -

MR. DAVIS: No anticipated change in that third bullet, Phase 2.

MR. KRAFT: Yeah, I think that's right. I think that's - just the same way in the bullet above it should have said Phase 2 severe accident water addition. You're right. Water addition and management.

MR. SZABO: Okay.

MR. KRAFT: That's a good pickup, absolutely. Because I would never suggest that just adding water solves that.

MR. SZABO: So, you know, the fact that you're potentially not meeting 109, right, we'll have to talk that through with Jennifer and -

MS. KORSNICK: That's the thing.

MR. KRAFT: Right. In previous conversations we talked about altering - potential for altering order. And our suggestion here is that technical requirements don't have to be altered. There are scheduled requirements that have to be altered probably more than the water management part rather than the water addition part.

MR. AMWAY: One of the ways we could address that is when we do the OIP is you have all the water addition requirements in the OIP, how you're going to do that and here's the dates you're going to do it. And a commitment to the water management part and the schedule for when you would be in compliance with the water management.

So, it will all be contained in the OIP. It's just the schedule at which we're doing each piece would be different.

MR. SZABO: All right. Are there any other questions on the take-aways before we just do closing?

Great. Does anybody want to provide any

closing remarks?

MS. KORSNICK: Well, I mean, I think we had really good dialog and discussion. I mean, I was here today, but I heard, you know, good discussion and dialog happened yesterday as well.

So, I think this topic that we're in is one of, you know, constant connection and dialog. We're learning, sharing what we're learning as we go through. And I just think keeping those lines of communications are very open and it's key for us in making progress.

MR. DAVIS: Thanks, Maria. We appreciate the information as, you know, Jennifer and I have talked several times about this and we said we were open to the idea of looking at it from a water management standpoint and that we were waiting to hear on information from the industry.

In fact, we told that to the Owner's Group Executive Committee. I think it was a week or two ago when they came in to meet with us.

We did tell them in that meeting that it would probably be a pretty high bar to get over to move the schedule beyond 2019. So, that's something that's going to have to be carefully considered, you know, with Jennifer and others. I think probably even with the

Commission at this point, but it's not necessarily that it's undoable. It's just we have to think through it carefully.

So, I mean, that's the only piece that I would add some caution.

MR. SZABO: The only last thing I have to say is thank you, everyone, for being here. Just remind everyone I am going to be unavailable for three weeks after Friday. My backup is Fred Schofer. That's F-R-E-D, period, S-C-H-O-F-E-R at NRC.gov.

And if you email me, you'll get an auto reply that will say that. But just in case anything comes up, we want to make sure that someone can respond. Thank you very much.

(Whereupon, at 10:35 o'clock a.m. the meeting was adjourned.)